ANNUAL REPORT

TPDES Storm Water Permit No. WQ0004705000
(NPDES Permit No. TXS000401)

System-Wide Annual Report

for the

City of Austin

Reporting Period: October 1, 2016 to September 30, 2017

Submitted to:

U.S. EPA Region 6
Compliance Assurance & Enforcement Division
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue
Dallas, Texas 75202

&

TCEQ Region 11
Wastewater Permitting Section
Storm Water & Pretreatment Team
(MC-148)
P.O. Box 13087
Austin, TX 78711-3087

March 1, 2018

Watershed Protection Department
CM-07-01

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City of Austin
Founded by Congress, Republic of Texas, 1839
Watershed Protection Department
P.O. Box 1088. Austin. Texas 78767

March 1, 2018

Ms. Rebecca L.Villalba, Team Leader
Storm Water & Pretreatment Team (MC-148)
Water Quality Division
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Re: City of Austin - TPDES Permit No. WQ0004705000 (NPDES Permit No. TXS000401)
Municipal Separate Storm Sewer System (MS4) System-wide Annual Report

Dear Ms. Villalba,

Please find herewith for your review, the MS4 system-wide annual report for the City of Austin. The report has been prepared as required by Part IV.C. of the permit and includes information on the City's compliance activities during the reporting period from October 1, 2016 through September 30, 2017.

As required by Part IV.E and in accordance with Part V.B.8 and of the permit, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If additional information related to any of the City's compliance activities described in the report should be required, please contact Ms. Lee C. Lawson, TPDES Program Coordinator at (512) 974-3348, or Ms. Roxanne Jackson, Division Manager Field Operations at (512) 974-1918.

Sincerely,

Michael L. Personett, Interim Director
Watershed Protection Department

SYSTEM-WIDE OVERVIEW

Introduction

The City of Austin was originally issued a Municipal Separate Storm Sewer System (MS4) Storm Water Permit by the Environmental Protection Agency (EPA ID. TXS000401) in September 1998. The City then renewed the MS4 storm water permit with the Texas Commission on Environmental Quality (TCEQ) in February 2006 (WQ0004705000), and was reissued a final permit on July 20, 2011. The City of Austin has continued to be in compliance with the activities required by the storm water permit and outlined in the City's Storm Water Management Program (SWMP) throughout each of the five-year permit terms; reporting on the execution of these activities during the reporting period from October 1st through September 30th of each year. The System-Wide Annual Report is due March 1.

Overview

This report documents the City's compliance activities during the reporting period from October 1, 2016 to September 30, 2017 (Permit Year 6, of the Extended Permit). We do not have our renewed permit approved as of March 1, 2018. The City of Austin continued to execute Storm Water Management Program activities during the reporting period. Detailed information related to these activities has been included in Section 1 (Status of Storm Water Management Program Implementation and Summary Data) of the annual report.

The City of Austin Texas Pollutant Discharge Elimination System (TPDES) Municipal Separate Storm Sewer System (MS4) permit (TCEQ ID No.WQ0004705000) expired in July 2016. The City of Austin initiated the MS4 permit renewal process in January 2016 as required, and a draft MS4 permit is currently in the final review process with the TCEQ and EPA.

Section 1. Storm Water Management Program Implementation and Summary Data

Section 1

STATUS STORM WATER MANAGEMENT PROGRAM IMPLEMENTATION AND SUMMARY DATA

Introduction

As required by Part IV.C.1.3. of the City's TPDES MS4 Storm Water Permit, the status of implementing the storm water management program (SWMP), the status of compliance with any schedules established under the permit, and a summary of the SWMP activities completed by the City of Austin during the reporting period from October 1, 2016, through September 30, 2017 have been included in the system-wide annual report as follows:

MS4 Maintenance Activities
(Section 1-SWMP)

Structural Controls
Status: On-going

The City of Austin Watershed Protection Department (WPD) is responsible for the operation, inspection, maintenance and repair of the City's storm water drainage infrastructure. The Field Operations Division (FOD) of the WPD directly administers these activities and continually coordinates with the other divisions within the WPD, including the Environmental Resources Management (ERM) and Watershed Engineering (WED) Divisions. The inspection and maintenance programs are part of a comprehensive drainage maintenance plan to identify, evaluate and solve flooding, erosion and water quality problems, including those related to non-point source pollution.

The following program tasks were performed to accomplish the City's inspection and maintenance goals for the reporting period:

- Removed debris and excessive vegetation from approximately 97.2 miles of open waterways to maintain flood flow conveyance and improve water quality.
- Removed vegetation three times in this reporting year from over 685 City maintained detention and water quality facilities.

- Conducted 926 inspections of City maintained detention and water quality facilities.
- Completed 1,974 inspections of privately owned and maintained detention and water quality facilities to enforce compliance with City Code and criteria.
- Removed sediment and debris obstructions from just over 5 miles of open channels to maintain flood flow conveyance, minimize erosion and improve water quality.
- Removed debris, sediment, vegetation and obstructions from 804 culvert and bridge locations to maintain flood flow conveyance and improve water quality.
- Cleaned approximately 15 miles of the storm water conveyance pipeline system to maintain flood flow conveyance and improve water quality.
- Inspected and cleaned as necessary 11,958 storm drain inlets to maintain flood flow conveyance and remove collected sediment, debris and other pollutants.

The City also continued efforts to identify and inspect residential and commercial ponds in the Barton Springs Zone (BSZ), repair non-functioning publically maintained facilities and ensure compliance and enforcement of privately maintained facilities. During the reporting period:

- WPD Field Operations staff inspected all of the publically maintained facilities within the BSZ and performed necessary maintenance on 57 of the facilities. There were 293 publically maintained controls in the BSZ as of September 30, 2017.
- Development Services Department (DSD), Environmental Inspection staff conducted 1,464 inspections of 300 commercial water quality controls in the BSZ subject to the Barton Springs Zone Operating Permit program requirements; staff issued 14 letters of non-compliance and 26 corrective action punch lists.
- WPD FOD staff continued to update the department's records associated with the public and private storm water management facilities databases to ensure more accurate documentation of activities.

Floatables Program
Status: On-going

The Field Operations Division (FOD) of the WPD is responsible for checking the condition of two monitoring sites on Lady Bird Lake periodically and after major storm events. Each trash boom site is inspected weekly and cleaned on a monthly basis, if

necessary, or as needed, after FOD staff verifies that site conditions are safe and adequate for access and will allow for the use of mechanical equipment without damage to the surrounding ground. During the reporting period, approximately 1.50 tons of floatable trash and debris was removed from the two boom locations on Lady Bird Lake (@ mouth of Shoal Creek and @ mouth of West Bouldin Creek).

Roadways Program
Status: On-going

The City of Austin Roadways Program addresses snow and ice management, road repair, street sweeping, litter collection and in-house new construction within the Public Right of Way (ROW), and activities to remove potential pollutants from entering waterways. Public Works Department (PWD) and Austin Resource Recovery (ARR) directly administer the activities for this program.

Snow Management

The average annual snowfall in the Austin area is one inch. As such, the City has developed an emergency response program that uses barricading and sanding to effectively manage slick streets and roadways during the rare ice and snow events. During such events, PWD staff evaluates the road conditions and identify streets and bridges that need to be sanded or barricaded to ensure public safety. No snow management activities were required during the reporting period.

Street/Public Right of Way Operation and Maintenance

ROW maintenance projects involving excavation are completed under a General Permit issued by the Development Services Department (DSD). During the reporting period the PWD continued the ROW roadway maintenance activities, using Best Management Practices (BMP) and controls appropriate for each project.

Street Sweeping

Routine cleaning of the City of Austin curbed streets is the responsibility of Austin Resource Recovery (ARR). Street sweeping in the downtown Central Business District is scheduled to occur daily to maximize removal efficiencies of the pollutants that accumulate in the high traffic density area. Street sweeping along major thoroughfares in other areas of the City is performed on varying schedules, but generally once per month, and residential curbed streets are swept on an average frequency of twice per year. During the reporting period, this program collected over 4,410 tons of trash, leaves, debris and dirt that had collected along impervious roadway surfaces in Austin.

Litter Collection

The Litter Abatement Program is the responsibility of the ARR. The Litter Abatement Program is implemented within the City limits. It targets some City-owned properties such as uncurbed streets and public right-of-ways for removal of trash, litter and debris in the effort to prevent the waste materials from entering nearby storm drains or waterways. In addition, the Litter Abatement Program removes dead animals from roadways, provides for the pick-up of brush and bulk items on a scheduled basis and maintains the litter receptacles in the Central Business District. During the reporting period, the Litter Abatement Program provided the following services:

- Removed 395 tons of litter from sidewalks and litter containers in the downtown area, street right-of-ways and other City-owned property.
- Removed 43 tons of dead animals from roadways.
- Collected a total of 11,345 tons of bulk items from residences within the service area.
- Collected a total of 8,477 tons of brush items from residences within the service area, and
- Collected a total of 34,316 tons of yard trimmings (to be recycled into compost) from residences during weekly collection activities.

Post-Construction Storm water Control Measures
(Section 2-SWMP**)**

Areas of New Development and Significant Redevelopment
Status: On-going

The Planning and Zoning Department (PAZ) is responsible for most comprehensive planning activities within the City limits and the extraterritorial jurisdiction (ETJ). The comprehensive planning activities include ongoing planning support in areas such as land use inventories, mapping, and analysis; population and demographic forecasting; neighborhood planning and transportation planning.

From October 1, 2016 to September 30, 2017, the City of Austin experienced a net growth of 20,601 persons to reach a total population of 958,607. This increase represents a 2.2% annual growth rate and is down from an annual increase of 2.9% from the previous year. The population for the Metropolitan Statistical Area on September 30, 2017, was 2,141,386. During the reporting period, the City completed 4 annexations. The total acreage annexed was as follows.

- 219 acres Full Purpose
- No acres in Limited Purpose
- 219 total acreage added to the City Limits in FY 2016-17.

Comprehensive Planning Process (Zoning, Subdivision & Site Development Plan Regulations)
Status: On-going

During the reporting period, PAZ staff reviewed zoning cases, and the Development Services Department (DSD) staff continued to review site development plan applications, subdivision plans and proposed utility projects for compliance with the water quality regulations of the City's land development code, as part of the overall development review process. For site plan and subdivision applications this process includes review by a number of different disciplines, such as environmental, water quality, drainage and transportation.

During the reporting period, City staff reviewed:

- 795 subdivision applications.
- 462 site development plans.
- 5 school site plans.
- 123 projects requiring zoning review.
- 114 underground storage tank permit applications.
- 679 General Permit applications.
- 157 Operating Permit applications for development in the Barton Springs Zone.

Department staff also continued to participate as necessary in variance presentations related to development projects to the Environmental Commission, a citizen advisory board.

Flood Control Projects

Existing Structural Flood Control Devices
Status: On-going

During the reporting period from October 1, 2016 through September 30, 2017, Watershed Protection Department (WPD) staff continued the activities detailed in the program description, including the required City code's and criteria elements in proposed flood control projects. The City of Austin's WPD Watershed Engineering Division (WED) continued to evaluate existing flood control facilities for flood and water quality retrofit opportunities. To assess the potential water quality impacts from proposed flood control projects, the City of Austin utilizes both regulatory design requirements and technical review to evaluate municipal and private flood projects. An example of this includes the following projects:

Lower Onion Creek Flood Hazard Mitigation, Ecosystem Restoration, and Recreation Project

The US Army Corps of Engineers (USACE) completed a Reconnaissance Study in 1999 and an Interim Feasibility Study in December 2006 for Onion Creek.

The Interim Feasibility Study identified a preferred flood hazard mitigation, ecosystem restoration, and recreational facility project for the Lower Onion Creek watershed. This partnership project with US Army Corps of Engineers consists of the buyout of 483 properties at risk of interior flooding in a 25-year storm, ecosystem restoration, and the construction of new park facilities on the vacant land.

All 483 properties in the Army Corps project area have been acquired as of fiscal year 2017. The Project Partnership Agreement with the Army Corps of Engineers was executed on 8/28/2014. The Corps issued a contract for design services in September 2016 for the design of the recreation component of the project. The Corps issued the construction contract at the end of fiscal year 2017.

Watershed Engineering Studies

In fiscal year 2017, the WPD WED staff completed a floodplain study for Onion Creek. The information is being used to identify flood risk, which can help citizens prepare for flooding, and to assist the City in prioritizing flood risk reduction projects. Staff also initiated a flood hazard mitigation study for the Upper Onion Creek watershed in response to recent, severe flooding. This study will provide updated flood risk information and will seek to identify options to reduce flood risk to properties within the watershed. An updated feasibility study assessment will also be conducted to evaluate flood risk reduction solutions to address flooding along the main-stem of Shoal creek from 15th St. to Lady Bird Lake.

Future Flood Control Projects
Status: On-going

During the reporting period the WPD Mission Integration and Prioritization (MIP) Team also continued to explore opportunities to incorporate into projects functionality and design features that have the potential to provide erosion control or water quality enhancements. Typical flood control projects include the upgrade of low water crossings and culverts, the acquisition of properties in flood prone areas, channel modifications, storm drain improvements and the construction or modernization of storm water detention facilities. Proposed projects must also comply with the requirements of the City's Environmental Criteria Manual (ECM) and Drainage Criteria Manual (DCM).

The WPD MIP Team, along with the Land Development Code (LDC) and ECM requirements assure that project impacts to water quality and riparian systems are evaluated and minimized. The DCM outlines design, performance and safety criteria for storm water management. Examples of this include the following projects:

Little Walnut Creek Flood Risk Mitigation – Metric Blvd. to Rutland Drive

The main branch of Little Walnut Creek from Metric Boulevard to Rutland Drive has a 100-year floodplain that extends beyond the boundary of the creek system and encompasses residential property and buildings. These properties are at a high risk of flooding in large storm events. The improvement project will include a bypass culvert system under Mearns Meadow Boulevard and an expansion of the existing regional detention facility at Mearns Meadow Park to reduce the flood risk from the 100-year storm event for 60 homes. The project will also improve the capacity and safety of roadways that cross the creek in this area. Project design is anticipated to complete in fiscal year 2018, Bid Award Execution Phase in Fiscal year 2019.

Old San Antonio Road Drainage Improvements

The existing Slaughter Creek crossing at Old San Antonio Road is overtopped in a 2-year storm event and is inundated in excess of 10 feet in a 25-year event. This road is frequently closed during rain events, creating extremely hazardous conditions for drivers and pedestrians. The improvement project will permanently close the roadway to vehicular traffic while still providing pedestrian and bicycle access. Construction of the project is expected in 2018.

Williamson Creek Flood Risk Reduction Buyouts

This project seeks to reduce flood risks for approximately 250 houses and roadways at high risk of flooding along the main-stem of Williamson Creek from its junction with Cherry Creek to South Congress. A feasibility study (including a reevaluation of previous Preliminary Engineering Reports) for flood control measures in this project area will begin in fiscal year 2018 after the phase 1 buyouts have been completed for the properties at the highest risk of flooding in the 25-year floodplain in the project area.

Meredith Storm Drain Improvements

The project will mitigate localized flooding for at least six (6) structural and yard flooding complaints. In addition it will relieve excess water from directly entering a karst feature. This project is currently in design which is expected to be completed in fiscal year 2018.

Del Curto Storm Drain Improvements

The Del Curto Storm Drain Improvement Project will mitigate the localized flooding of several roadways and at least 10 building and yard complaints. The project area is located in the West Bouldin Creek watershed, an area of the city that is undergoing rapid development. This project is currently in design, and scheduled to be complete design in fiscal year 2018.

Oak Park/Oak Acres Storm Drain Improvements

The Gaines Tributary of Barton Creek is located north of Highway 290 near the "Y" at Oak Hill. The roadways and properties along this tributary are subject to frequent localized and creek flooding as a result of undersized and non-existent storm drain infrastructure, a narrow and constrained creek system, an overflow from the Williamson Creek watershed during large storm events, and changing overland flow patterns. This project, currently in the final design phase, will implement solutions to mitigate these flooding problems. Solutions include property acquisitions, storm drain improvements, and upgraded low water crossing, and an open channel, which the project team selected over a concrete-lined channel in part due to its water quality benefits. Design phase is scheduled to begin fiscal year 2017, and complete fiscal year 2019.

East Bouldin Annie St. Storm Drain Improvements

The purpose of this project is to mitigate flooding impacts associated with a failing storm drain system. The contributing project area is primarily residential, generally located in the East Bouldin watershed. The existing storm drain system, both undersized and aged, has deteriorated to the point of needing to be replaced. Approximately 4,000 linear feet of existing storm drain will be evaluated. Once completed this project will mitigate localized flooding issues for approximately 10 structures. This project is currently in design.

Whispering Valley/West Cow Path Flood Mitigation Project

This multi-object project includes improvements for the railroad creek crossing and storm drain installation near Whispering Valley Dr. and West Cow Path. The first phase of the project, and upgrade of the railroad creek crossing, will reduce flooding for seven (7) structures in the 100-year floodplain. The second phase of the project will mitigate the impacts of localized flooding for at least 13 buildings and properties. The design engineer submitted updated hydrologic and hydraulic models for the different railroad bridge configurations near Whispering Valley. WED staff is reviewing the updated models. Design Phase is scheduled to begin in fiscal year 2018 with completion in FY 2020.

Waller Creek Tunnel Flood Control Project

The project will consist of an underground storm water bypass tunnel approximately one mile long and 22 feet in diameter beginning in Waterloo Park and ending at Lady Bird Lake near Waller Beach with several side weirs. The tunnel will maintain a constant water flow through the creek, even during dry periods. The tunnel will result in the removal of 12 roadways and 42 buildings from the floodplain, make 28 acres available for development, and improve water quality in the creek and prevent further erosion.

Construction of the tunnel began in July 2011,the plans for the inlet were bid out in August 2011, and construction on the inlet began in mid-November 2011.The outlet was bid out in March 2012. Construction of all tunnel components should be completed in 2017.

Illicit Discharges Detection and Elimination
(Section 3-SWMP)

Illicit and Allowable Discharges
Illicit Discharge Program
Status: On-going

The City's Illicit Discharge Program includes a series of regulatory requirements in City Code to effectively prohibit illicit discharges and improper disposal into the municipal separate storm sewer system (MS4). These code requirements are enforced by programs within the City's Watershed Protection Department (WPD). City staff investigates suspect facilities or activities, initiates inspections of the premises and connections to the MS4 and works to obtain voluntary compliance with City Code requirements. When voluntary compliance is not obtained, enforcement may escalate to Class C misdemeanor prosecution in Municipal Court or referral to County Court for Class A and B misdemeanor prosecution. In extreme situations, a case may be sent to the Travis County Prosecutor's Office for consideration of felony prosecution at the District Court level. Non-storm water discharges to the City's MS4 are addressed through the City's Illicit Discharge Program.

Detection and Elimination of Illicit Discharges
Overflows and Infiltration (Wastewater Pipelines)
Status: On-going

Austin Water (AW) is responsible for maintaining the integrity of its wastewater collection system to prevent the infiltration or seepage of wastewater into the storm sewer system and waterways. This task is accomplished by using flow monitoring, sewer cleaning, television inspection, smoke testing, dye testing, walking of creeks with sewer line crossings and working with the WPD Spills and Complaint Response Program, to

determine the location and sources of seepage, exfiltration, and inflow/infiltration. During the reporting period between October 1, 2016 and September 30, 2017 the following program tasks were performed by AW staff to accomplish the City's inspection and maintenance goals:

- Inspected 2,244,828 linear feet of wastewater pipeline via television.
- Cleaned 2,357,043 linear feet of wastewater pipeline.
- Smoke tested 1,018,725 is linear feet of wastewater pipeline.
- Replaced 31,701 linear feet of wastewater main pipeline.
- Handled a total of 1,967 requests for wastewater service calls including stop-up, backups and overflows.
- Continued with improved wastewater overflow emergency response time – 96.88% of emergency calls associated with wastewater overflows had a crew on site to relieve the problem within one hour or less of the call being dispatched; 99.74% of calls had a crew on site to relieve problem within three hours or less.
- Continued with process improvements for correction, cleanup and investigation of cause of all wastewater overflows, backups, stop-ups, odor complaints, and other problems.
- Continued to provide on-the-spot repair of small leaks in the wastewater collection system as necessary.

Overflows and Infiltration (Septic Systems)
Status: On-going

Austin Water regulates on-site sewage facilities located within its jurisdictional boundaries through the management and implementation of the City’s On-Site Sewage Facilities (OSSF) Program. The TCEQ has granted authority to Austin Water to enforce the requirements established in Title 30 of the Texas Administrative Code (TAC) Chapter 285 and has approved the additional requirements under City Code 15-5. The focus of the program is to abate and/or prevent pollution and injury to the public health from the use of inadequate and/or failing private sewage facilities thus preventing the improper disposal of domestic waste and sewage. Austin Water’s OSSF Program generally applies

to all subdivisions or lots (commercial) (residential) within the Austin's Full Purpose jurisdiction, Limited Purpose annexation areas where Health and Safety Codes applies. All other properties are required to comply with city regulations through plat restrictions or legal contractual agreements. A summary of the OSSF Program activities during the reporting period has been provided below:

- Reviewed 59 plans for new or modified OSSF.
- Issued 50 permits to construct OSSF.
- Issued 24 letters of approval for minor modifications to sites served by OSSFs.
- Completed 146 site inspections, (e.g., site evaluations, open trench, rock and pipe, and final inspections) to ensure compliance with existing design and installation requirements.
- Conducted 108 inspections to ensure the proper abandonment of OSSF's.
- Conducted 6 OSSF pollution complaint investigations.
- Conducted 14 investigations related to malfunctioning systems and potential permit violations.
- Issued 141 notices of violation to address maintenance reporting deficiencies.

Household Hazardous Waste Program
Status: On-going

The City's Austin Resource Recovery (ARR) Household Hazardous Waste Program (HHW) serves residents of Austin and Travis County Texas. The HHW Program provides for daily collection at a permanent facility with service throughout the week, and for customers who require home pickups or other accommodations. Currently the HHW program hours are Monday thru Friday 9 a.m. to 5 p.m. and Saturday 7 a.m. to noon. This program benefits Austin area residents by providing convenient, responsible disposal options so that hazardous household wastes are removed from the City's regular liquid (sanitary sewer) and solid waste streams while making homes safer. Proper disposal of hazardous waste also decreases this category of material from being disposed of in vacant yards, easements or storm sewer drains. Participation levels have increased

from 450 households at the initial event to some 29,494 households serviced in fiscal year 2016-2017. A total of approximately 1,872,485 pounds of household hazardous waste were diverted from City municipal waste streams this reporting period.

During the reporting period the HHW Program accomplished the following activities:

- Provided drop-off services to 28,494 households in the Austin area.
- Handled a total volume of 1,872,485 pounds of hazardous waste.
- Disposed of 510,105 pounds of flammable materials.
- Disposed of 29,378 pounds of corrosive materials.
- Recycled 486,979 pounds of materials (this does not include paint).
- Recycled 333,795 pounds of paint.
- Recycled 105,397 pounds of waste oil and 4,400 pounds of oil filters.

NPDES and TPDES Permittee List:
Summary data is reported in the Section 5 of the system-side Annual Report.

MS4 Outfall Map:
MS4 outfall maps available upon request.

Illicit Discharge Inspection Program
Status: On-going

The City's Illicit Discharge Inspection Program is based primarily on the activities of the Spills and Complaint Response Program (SCRP) of the Watershed Protection Department (WPD). SCRP staff investigate complaints/reports of illicit discharges to the storm sewer system, tracking the route of an illicit discharge and attempting to identify its source and cause. Once an illicit discharge source and cause have been identified, SCRP staff will work with the responsible party(s) to obtain compliance with City Code requirements. This includes the coordination of any initial response activities that may be necessary, supervision of remedial activities and possible referral to other more appropriate City programs, such as the Stormwater Discharge Permit Program (SDDP), that have regulatory and/or permitting authority over the facility.

During the reporting period between October 1, 2016 and September 30, 2017 the SCRP staff responded to a total of 1,055 incidents that were reported through the 24-Hour Pollution Hotline. Two illicit plumbing connections were detected and corrected during illicit discharge investigations by the SCRP staff.

Spill Prevention and Response
Status: On-going

WPD Spills and Complaint Response Program (SCRP) maintains a rapid response capability for the investigation of environmental emergencies. When hazardous materials are involved, the SCRP staff work directly with the Austin Fire Department (AFD) Hazardous Materials Emergency Response Team. In these cases, emergency incident notification comes from AFD dispatch. Notification also comes from other agencies such as the Texas Commission on Environmental Quality (TCEQ), Travis County and through the WPD Pollution Hotline. The hotline operates on a 24-hour basis, thus allowing for after-hours notification of environmental emergencies. The SCRP also responds to non-emergency pollution complaints, which are received from many sources, including:

- private citizens calling the WPD Pollution Hotline directly.
- referrals from other WPD field staff.
- referrals from other City departments such as the Austin Water and the Austin Police Department.
- referrals from other regulatory agencies such as the TCEQ

The Spills and Complaint Response Program has developed a categorization system for the reports of illegal discharges that are received based on the severity of the incident and the potential to pollute surface water or storm water quality. The categorization system assists in the identification of the speed of response necessary and the tracking of the reports received. The two incident categories are:

- *Priority Incidents* - which pose an immediate threat to water quality, and
- *Non-priority Incidents* - which do not pose an immediate threat to water quality.

During the reporting period the Spills and Complaint Response Program completed the following activities:

- Responded 495 priority incidents
- Responded to 560 non-priority incidents

As a result of these pollution investigations, the Spills and Complaint Response Program recovered 283,255 gallons and 520 cubic yards of pollutants.

Austin Fire Department Special Operations
Status: On-going

The Austin Fire Department (AFD) hazardous materials response is one of several activities that are the responsibility of the Special Operations Division. The Special Operations Division specializes in maintaining response capabilities to hazardous material spills or other incidents that may endanger human health and safety within the City limits. During the reporting period, the AFD Special Operations Division responded to 1,901 incidents, of which 40 were at facilities that have been identified as requiring AFD Aboveground Hazardous Materials Permits (see Industrial and High Risk Runoff).

Pollution Prevention/Good Housekeeping for Municipal Operation
(Section 4-SWMP**)**

Pollution Prevention/Good Housekeeping Program
Status: On-going

The Pollution Prevention Good Housekeeping for Municipal Operations program is based on several programs as described in the Storm Water Management Plan. This includes the Integrated Pest Management, Storm Water Discharge Permit, and MS4 Maintenance Programs. WPD maintains a list of all City properties and facilities. Watershed Protection Pollution Prevention (PPR) staff screen the list for the purpose of identifying and prioritizing city facilities that could contribute to pollutants in storm water runoff.

PPR Staff inspects these City and public facilities on a rotational basis, and periodic training on TPDES storm water best management practices is provided to facilities staff, in various city departments. During the reporting period:

- Conducted 63 inspections of City operations with storm water permit coverage to verify compliance with storm water regulations.
- Conducted 27 site visits of City owned properties to verify compliance with TPDES storm water regulations.
- Provided TPDES and spill clean-up training for Public Works Department Seal Coat and Overlay Divisions, superintendents, and supervisors.
- Assisted City of Austin Parks and Recreation staff with end of season swimming pool discharges by testing the water to ensure complete removal of chlorine prior to releasing the water to area waterways.
- Assisted with special events; coordinating with event staff to identify appropriate BMP's and pollution prevention measures for each event, including a guide for green events.
- Educated City Graffiti Abatement Program staff on water quality best practices for washing Graffiti from buildings and structures. Observed abatement practices at several sites. Trained program staff on TPDES rules so they understand that this graffiti cleaning wastewater cannot discharge to our MS4.

Waste Handling
Status: On-going (see Section 1-SWMP) Structural Control Maintenance

All materials removed from structural control maintenance activities were disposed of in an acceptable permitted local landfill.

Pesticide Herbicide and Fertilizer Application
Integrated Pest Management (IPM) Program
Status: On-going

The Integrated Pest Management (IPM) Program is a City-wide program that actively coordinates educational outreach activities and information to Texas Department of Agriculture licensed pesticide applicators, retail nurseries, the landscaping community,

City land managers and their staff, and the general public to promote the use of environmentally sound herbicide, pesticide and fertilizer management practices.

The IPM Program is managed by the WPD and is responsible for the following activities:

- Implementation of an IPM public education campaign.
- Providing guidance to City of Austin departments and programs in pest management issues.
- Review of IPM plans as required by the land development code review process.
- Providing technical assistance on IPM practices for negotiated development agreements between the City and other entities.
- Ensure compliance of the Save or Springs (SOS) water quality ordinance via review of IPM plans required for development projects in the Barton Springs Zone.
- Coordination of compliance with the TPDES Pesticides General Permit (TXG870000).
- Maintain pesticide application and pesticide applicator license records for all city departments (except Austin Energy) that use pesticides.

The target audiences for these activities are:

- Homeowners and the general public in the Austin area.
- Professional communities including those who design, install and manage outdoor areas.
- Retail distributors of pest control products and gardening supplies.
- City of Austin employees responsible for pest management and grounds maintenance.

During the reporting period the IPM Program accomplished the following:

- Coordinated with the WPD education staff to distribute brochures and other IPM materials to the general public, retailers, City staff and pest management contractors. Information related to this item can be found Section 7 (Enforcement Actions, Inspections and Public Education Programs) of the annual report.
- The WPD Education staff hosted 20 Grow Green trainings for homeowners and landscape professionals, by staffing a booth at an environmental event, or giving a presentation. 18 in-store group trainings were provided to staff at Grow Green partner nurseries.

- Provided Structural Pest Control Service support.
- Austin Water Center for Environmental Research, a partnership of the City of Austin, The University of Texas at Austin, and Texas A&M University) hosts the Texas Department of Agriculture Structural Pest Control Service's Austin area exams and classes. These Structural Pest Control Service classes and exams are provided for Austin area pest control and landscape management businesses, local school district employees and local governmental agency staff involved in pest control and landscape maintenance. Structural Pest Control Service training emphasizes the use of Integrated Pest Management for pest control, termite control, structural fumigation and weed control to reduce the use of chemicals in the environment.
- Additional IPM training was provided to City staff by providing complimentary tickets to Grow Green landscape Professional Training series.
- Administered the internal IPM Program, providing guidance to various City departments related to pest management activities.
- Administered an IPM Review Program for development projects. One-hundred and seven (107) private and public development IPM plans were reviewed for compliance with City codes and criteria.
- Updated online site development IPM plan application process.
- Served on the Southern Region IPM Advisory Committee.

List of Municipal Facilities:

Status: On-going

See Appendix D for a list of municipal facilities.

Industrial and High Risk Program
(Section 5 SWMP)

Industrial and High Risk Inspection Program
Status: On-going

The Industrial and High Risk Program is based on the activities of the Austin Fire Department (AFD) and the Watershed Protection Department (WPD) programs.

Hazardous waste treatment, disposal or recovery facilities and facilities subject to SARA Title III

The AFD Aboveground Hazardous Materials Permit Program is responsible for the inspection and permitting (three year permit term) of Austin facilities that store hazardous materials. During the reporting period, the AFD Aboveground Hazardous Materials Permit Program continued these activities, maintaining information on 2,609 permit locations (262 are Tier II sites) and inspecting 386 facilities.

Inactive Municipal Landfills

WPD is responsible for periodic visual inspection of inactive municipal landfill sites and inspection at initiation of remediation activities at selected sites. During the reporting period WPD staff completed inspections at the following locations in association with mitigation activities:

- **Waste Management, Inc., Industrial Waste Unit -** At the request of the City Council, Watershed WPD staff began working with Waste Management, Inc. (WMI) staff in 2001 to develop a groundwater-monitoring plan for the Austin Community Landfill Industrial Waste Unit (IWU). The Austin Community Landfill IWU is a closed industrial liquid waste disposal area that was operated in the 1970s and received large quantities of solvents, acids and other industrial liquid wastes. Citizens have been concerned that the IWU might be leaking and requested monitoring of groundwater and surface water. In 2002 an agreement between the City and Waste Management, Inc. was finalized that requires WMI to conduct additional groundwater monitoring near the IWU. Placement of additional cover over the IWU was also required to prevent infiltration of storm water. The City continues to receive and review these monitoring reports and will work with WMI and/or the TCEQ to address any identified problems.

- **Brinkley-Anderson Landfill** – This abandoned landfill is located in northeast Austin near the intersection of Highway 183 and U.S. 290 East and is located on the east bank of Little Walnut Creek. Watershed Protection Department staff has been working with the owners of the Salado at Walnut Creek Apartments, which overlie a portion of the landfill, to address leachate discharges to the creek from their drainage facility. The owner's consultant has designed a system to redirect that leachate to the sanitary sewer system. The system was approved by TCEQ in 2009, and subsequently submitted to the City for review. Once finally approved, it was anticipated that the owner will begin installation and construction in 2011. As of December 2017, the owner has not submitted final plans for installation.

- **Lott Avenue Dump Site –** This small dumping area was discovered in 2010 as a result of a citizen complaint regarding trash in a tributary of Fort Branch Creek. After large areas of surface dumping were removed from the stream channel by Watershed Protection Department crews; buried waste was discovered in the banks of the creek in several areas. The waste appears similar to the Rosewood site, likely ash from burned municipal-type waste. In 2012, the City began design of remediation for the site. Design work continued in 2013-2014 and construction is expected to begin in mid-2018.

Industrial facilities that the municipality determines are contributing a substantial pollutant loading to the municipal storm sewer system

The Stormwater Discharge Permit Program (SDPP) is responsible for identifying facilities that may be contributing a substantial pollutant load to the City's municipal storm sewer system (MS4) and establishing a database of industrial and high-risk facilities discharging to the City's MS4 within the Austin city limits.

During the reporting period, SDPP staff continued to contact industrial facilities which according to their listed SIC codes, were required to obtain a Multi-Sector General Permit (MSGP) under the State's TPDES storm water permit program. Staff provided facilities notification regarding the issuance of the MSGP, instructed facilities to confirm their permit eligibility and provided instructions for obtaining permit coverage or no exposure certification.

Facilities are directed to complete the appropriate forms, submit originals to the State and forward a signed copy of either their Notice of Intent (NOI) or No Exposure Certification (NEC) to the City of Austin. Facilities declaring a non-industrial status were required to sign and return a City of Austin non-industrial Facility Declaration Form and were advised to update their SIC code to one that accurately reflects their business activities.

In addition, SDPP staff also focused efforts on those facilities that may not be subject to the MSGP requirements, but are believed to have the potential to contribute pollutant loads to the MS4. During the reporting period, the staff permitted 997 facilities (both MSGP and non-MSGP) and inspected 370 facilities within the City's Full Purpose Jurisdiction.

As a result of these efforts, the SDPP recovered approximately 1,615 gallons and 33 cubic yards of pollutants. A total of 7 illicit plumbing connections were detected and corrected during illicit discharge investigations by SDPP staff.

Underground Storage Tank Leak Protection Program

The Development Services Department (DSD) Underground Storage Tank Leak Detection Program (UST) continued to focus efforts on all permittable facilities with underground storage tanks found within both the Barton Springs Zone and the Full Purpose City Limits. The UST Program staff conducted inspections of identified facilities, ensuring compliance with City Water Quality Codes, including proper storage, monitoring and leak detection activities. The UST Program staff recommend best management practices and provide educational materials applicable to each operation as needed and during permit renewals. The UST Program issued both storage and/or construction permits to identified facilities in the Barton Springs Zone. During the reporting period, the UST Program issued 8 construction permits; renewed 17 (underground) hazardous materials storage permits (for a three-year period) and completed 103 inspections in the targeted Barton Springs Zone area.

Construction Site Runoff
(Section 6-SWMP)

Site Development Plan Regulations
Status: On-going

The Development Services Department (DSD) staff continued the site plan review program functions within the City's planning jurisdiction. The DSD environmental review staff reviews site plan, subdivision applications and utility projects within the City and the ETJ for compliance with water quality regulations regarding water quality zones, impervious cover limitations, erosion and sedimentation controls, site disturbances, permanent final stabilization, cut and fill, water quality controls, spoil disposal, storm sewer discharges, wastewater restrictions, roadways, where applicable.

The WPD/ERM staff reviews applications for compliance with critical environmental features, including wetlands. Detailed information related to the program activities have been described in the "Areas of New and Significant Redevelopment" component of this section.

Inspection of Sites During Construction
Status: On-going

The DSD Environmental Inspection staff are responsible for inspecting construction projects for compliance with the approved plan which includes code and criteria manual requirements. Environmental inspectors conduct a required Pre-Construction meeting with the owner's representative, engineer, contractor, and relevant inspection staff, to review construction phase activities, in the plan details. The pre-construction handout is signed by the responsible parties, a copy provided to contractor.

Staff developed the Pre-Construction Handout to educate the contractors and developers and help guide them through the City's environmental inspection and enforcement procedures. The handout has detailed diagrams and information on inspection of water quality and drainage ponds, maintenance requirements for BMP's, spill response contacts, TPDES Construction General Permit (CGP) permitting information and contacts. Inspectors review the approved erosion sedimentation plan for placement and maintenance of erosion controls, water quality and drainage construction, and site restoration activities.

During the reporting period, DSD Environmental Inspection Staff:

- Conducted 19,653 inspections at commercial construction sites and 26,384 inspections at residential construction sites to ensure compliance with City Code requirements.
- Inspected 77% of the 17,374 permitted commercial sites monthly.
- Achieved 93% compliance rate at the inspected commercial sites.
- Issued 106 stop-work orders due mostly to inadequate erosion and sedimentation controls and/or development activities without the required approved site plan, or permits

Education and Outreach Program for Construction Site Operators
Status: On-going

During the reporting period, the City continued the Education and Outreach Program for construction site operators, including the following activities:

- Provide written materials upon request related to local, state and federal regulatory requirements and technical guidance and non-technical information to the development, construction and engineering communities as well as the general public on an on-going basis.
- Continued meeting with development, construction and engineering communities as well as City staff during the design, development review and site construction phases of projects.
- Continued internal training of City inspection, review and project management staff related to changing state and federal regulatory requirements associated with construction activities.
- Provide technical guidance and information on a request basis related to compliance with the TCEQ Construction General Permit (CGP).

Public Education and Involvement
(Section 7-SWMP)

Public Education
Water Quality Education and Awareness Programs
Status: On-going

The public education and awareness efforts of the City of Austin encompass a wide variety of water quality-related programs. The Watershed Protection Department (WPD), Austin Resource Recovery (ARR), and Austin Water (AW) each have programs that provide water quality protection and pollution protection education to citizens in the Austin area. Detailed information on the City's public education program efforts during the reporting period have been provided in Section 7 (Enforcement Actions, Inspections & Public Education Programs) of the annual report.

Public Involvement and Participation
Community Education
Status: On-going

Detailed information on the City's public involvement, participation and community education have been provided in Section 7 (Enforcement Actions, Inspections, & Public Education Programs) of the annual report.

Monitoring Programs
(Section 8-SWMP)

Representative Monitoring

Watershed Protection Department (WPD) Environmental Resource Management (ERM) monitoring staff are responsible for the City of Austin's Representative Monitoring Program. The principal objectives in the effort to satisfy the representative monitoring requirements for the City of Austin's municipal separate storm sewer system (MS4) permit are to characterize not only the quality and quantity of storm water discharges, but the effect these discharges may have on aquatic environments in the Austin area. See details in Section 4 (Summary of Monitoring and Other Data) of the annual report.

Water Quality and Biological Monitoring
Status: On-going

Barton Springs Complex Sediment Screening

Three (3) sediment samples were collected from within Barton Springs Pool. Additional sediment samples were collected at Eliza, Old Mill and Upper Barton Springs, karst springs related to Barton Springs (see Appendix E). An extended list of constituents in sediment were analyzed at all the springs in the July 2017 sampling event. Field replicate quality assurance samples were collected per established standard operating procedures and QA results are available on request. Results of all the sediment sampling activities that occurred during the reporting period have been summarized in Section 4 (Summary of Monitoring and Other Data) of the report.

Barton Creek Complex Water Quality Monitoring

As required, Watershed Protection Department conducted a variety of ambient and storm water monitoring along Barton Creek and Barton Springs. A brief description of the types of monitoring conducted during the reporting period is listed below.

- Collection of benthic macroinvertebrate data on a semi-annual basis at a minimum of four representative locations along the mainstem of Barton Creek within the Barton Springs Zone.
- Regular spring outlet and surface water sampling continued at Barton Springs Pool. The frequency was sufficient to identify trends that threaten this water resource in a timely manner. Sampling occurred on a monthly basis and included analysis for nutrients and Total Suspended Solids (TSS).
- Comprehensive water quality sampling at Barton Springs and other associated spring outlets continued on an annual basis. Samples were analyzed for an extensive suite of parameters, including metals, volatiles, semi volatiles, bacteria and selected pesticides and herbicides. Parameters approaching levels of concern or detected frequently will be examined biannually.
- A data logger was continually deployed (except for maintenance and data retrieval) at a cave at the bottom of Barton Springs Pool to collect basic physical parameters.

A summary of the Barton Creek monitoring activities has been provided in Section 4 (Summary of Monitoring and Other Data) of the report.

Environmental Integrity Index (EII)

During the five year permit period, the Environmental Resource Management (ERM) Division of the WPD continued to monitor and assess the ecological integrity and the degree of impairment of creeks within the watersheds of the Barton Springs Zone (BSZ) utilizing the Environmental Integrity Index (EII);
(http://austintexas.gov/department/environmental-integrity-index

During this reporting period, ERM staff conducted EII assessments of the Barton and Williamson Creek watersheds located within the Barton Springs Zone. Additional

information related to the monitoring activities has been provided in Section 4 (Summary of Monitoring and Other Data) of the report.

Critical Environmental Feature Protection
Status: On-going

During the site development permit application process, City of Austin Watershed Protection staff reviewed site plans for large-scale residential and commercial development to ensure that Critical Environmental Features (CEF's) are properly identified and buffered from development. WPD staff identified new CEF's within Austin's jurisdictions, during a review of approximately 742 site development permit applications. Approximately 211 acres of new protective buffers were established by WPD staff, bringing the cumulative citywide total to approximately 6,500 acres.
The estimated area of CEF buffers is less than the total reported in FY16. The GIS layers for CEF buffers were updated correcting some previously redundant areas, improving the accuracy of the estimate.

Dry Weather Screening
Status: On-going

WPD ERM monitoring staff are responsible for the dry weather screening activities. Detailed information on the Dry Weather Screening activities during the reporting period have been provided in Section 4 (Summary of Monitoring and Other Data) of the annual report.

Wet Weather Screening
Status: On-going

WPD TPDES Coordinator staff are responsible for wet weather screening activities. Two (2) watersheds were screened during the reporting period. Detailed information on the wet weather screening activities for these two watersheds has been provided in Section 4 and (Appendix C) of the annual report.

Industrial and High Risk Monitoring
Status: On-going

Austin Fire Department (AFD) and WPD/PPR have an Industrial and High Risk Monitoring Program that identifies and prioritizes facilities that have the potential to discharge pollutants into the municipal separate storm sewer system (MS4). As part of this effort staff identify facilities eligible for NPDES/ TPDES storm water discharge permit coverage and request that analytical monitoring data collected by the facility (to comply with state or federal permit requirements) to be submitted to the WPD/PPR for review. See details in Section 4 (Summary of Monitoring and Other Data) of the report.

Section 2. Proposed Changes to the Storm Water Management Program

2. Proposed Changes to the Storm Water Management Program

Introduction

As required by Parts III.H.1. and IV.C.3.c. of the issued permit, a review of the current Storm Water Management Program (SWMP) was conducted. Based on this review, the City of Austin did not identify any substantive changes to the permit or the associated SWMP for reporting year 2016-2017, Year Six (6) of the Extended Permit.

As required by Part V. C.4.b. of the issued permit, the City of Austin initiated the MS4 permit renewal process in January 2016. As of January 2018 the approved final permit has yet to be issued, but the City recognizes that the new permit may require modifications to the SWMP document. The City will complete any necessary changes to the SWMP document as directed by the compliance schedule included in the new permit once approved, and appropriately identify those modifications in the next system-wide annual report.

Proposed Modifications

Global Changes

Grammatical, typographical, and other incidental, non-substantive changes were made throughout the SWMP document.

Section-Specific Changes

The City of Austin is not requesting any changes to the Storm Water Management Program (SWMP).

Section 3. Revisions to Assessment of Controls and Fiscal Analysis

3. REVISIONS TO ASSESSMENT OF CONTROLS AND FISCAL ANALYSIS

Introduction

As required by Part IV.C.4.c. of the permit, the City of Austin has reviewed the assessment of controls and the fiscal analysis reported in the City's permit renewal application. Based on the review, the City has no information to update in either the assessment of controls or the fiscal analysis for reporting year FY16-17.

Assessment of Controls

No revisions to the assessment of controls submitted in the City's permit renewal application are warranted at this time.

Fiscal Analysis

The amount of funding for each program included in the City of Austin Storm Water Management Program (SWMP) has not changed since the last reporting period.
The Fiscal Analysis for 2016-2017 is provided in Section 6 of the Annual Report.
Funding for each program is dependent upon the collection of adequate revenues and the allocation of these funds to the programs each year by the City Council during the budget approval process.

Section 4. Summary of Monitoring and Other Data

4. SUMMARY OF MONITORING AND OTHER DATA

Introduction

As required by Part IV.C.4. of the City's permit, a summary of the data, including monitoring data that is accumulated throughout the year has been included in the system-wide annual report. During the reporting period between October 1, 2016 and September 30, 2017, the City's Watershed Protection Department (WPD) conducted sampling activities associated with the Representative and Rapid Bioassessment Component monitoring requirements. Information related to all the City's TPDES monitoring efforts has been provided as follows.

Representative Monitoring

The Watershed Protection Department (WPD) Environmental Resource Management (ERM) staff are responsible for the City of Austin's Representative Monitoring Program. The principal objectives in the effort to satisfy the representative monitoring requirements for the City of Austin's municipal separate storm sewer system (MS4) permit are to characterize not only the quality and quantity of storm water discharges, but the effect these discharges may have on aquatic environments in the Austin area. These objectives were met through the continued implementation of a monitoring program composed of traditional chemical water quality measures and biological integrity assessments.

Streams that receive storm water discharges from Austin's MS4 have been selected to represent the variety and intensity of development pressures on Austin's surface water resources. Storm Water monitoring will be conducted at USGS- type stations. Sites will be selected to characterize storm water influences and flow during storm events, a minimum of three sites will be sampled in Year 1 and Year 4 of the permit period. The composite samples will be analyzed for nutrients, metals, field and physical parameters. An overview of Austin area watersheds and the representative monitoring site locations sampled in FY17 have been included in Figure 1.

Storm Water Sampling Component

The storm water monitoring component of the program consists of four monitoring sites at outfalls located within three watersheds. Pertinent information about each monitoring location has been included in Table 1.

Figure 1. City of Austin Representative Monitoring Locations

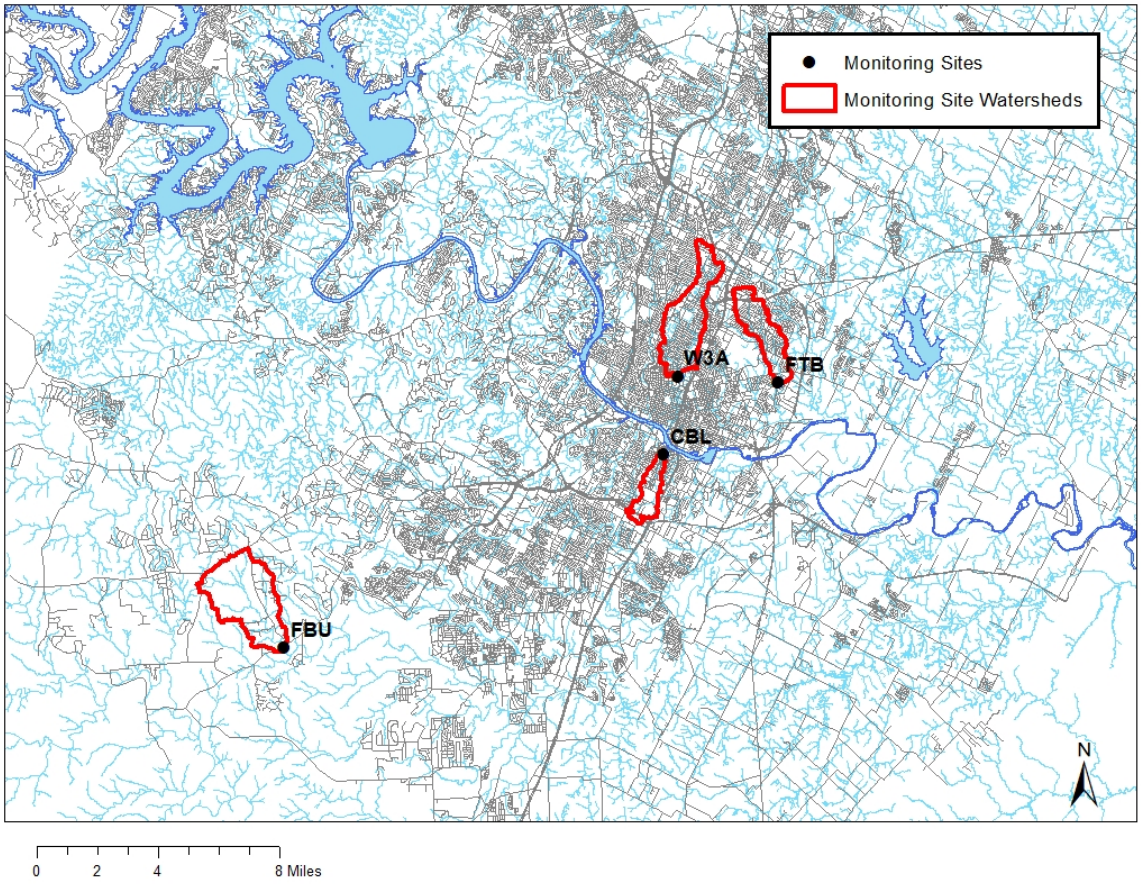


Table 1. Storm Water Monitoring Site Locations

Watershed	Site No.	Monitoring Site Location	Drainage Area (Acres)	Land Use	Receiving Water Body (Segment No.)
Bear Creek					
	001	Bear Creek @ FM 1826	3563	Undeveloped	1427
Waller Creek					
	002	Waller Creek @ 23rd St.	2524	Mixed Urban	1429
Fort Branch Creek					
	003	Fort Branch near Webberville Road	1600	Residential (Mixed) Urban	1428
Blunn Creek					
	004	Blunn Creek near Little Stacey Park	786	Mixed Urban	1429

Sample Collection and Analysis

The City of Austin has chosen to utilize the rapid bioassessment monitoring option. As described in the TPDES Permit No. WQ0004705000, Part IV.A.2.b.; the MS4 will be reporting on storm water monitoring events in permit years one and four. This report provides information on the compliance activities completed in permit year six (6) of the extended permit. All other requirements of Part IV.A1., A.5 remain unchanged.

Storm water monitoring consisted of the collection of composite storm water samples using automatic water quality samplers (Isco3700) and bubbler-type flow meters (generally ISCO 4200) at each outfall during storm events. The sample aliquots were collected for at least the first three hours of runoff or for the entire period of discharge if the duration is less than 3 hours. Sample aliquots were collected based on equal volumes of runoff. In addition to the composite sample, one grab sample was collected at each of the four outfalls during the first 2 hours of runoff of the same runoff event. The storm water samples were taken to an EPA-approved water quality laboratory for analysis and grab samples were tested for the parameters listed in Table 2. Storm water monitoring staff collected pH (S.U.) and temperature (ºC) information from the grab samples prior to transporting the samples to the laboratory.

Table 2. Grab Sample Parameters

PARAMETER	UNITS
Oil and Grease	mg/l
Fecal Coliform	colonies/100ml
Enterococci	colonies/100ml
Hardness (as $CaCO_3$)	mg/l

In addition to the event mean concentration data collected from laboratory analyses, the following information is collected for each sampled storm:

- Rainfall depth (in.)
- Runoff volume (gal.)
- Event duration (hr.)
- Duration of the intervening dry period (hr.)

Seasonal Loadings and Event Mean Concentration

As required by Part IV.A.2.4 of the permit, the City is required to provide the seasonal loadings and event mean concentrations (EMCs) data for the parameters listed in Part IV.A.1.a.(1). of the permit, for each of the four storm water outfall monitoring locations in reporting year four of the permit term. This is reporting year six (6) of an extended permit, therefore no seasonal loadings or event mean concentration information are included.

Dry Weather Field Screening Program

The City of Austin conducted dry-weather screening in 2017 as part of its compliance with the TPDES MS4 permit. Screening was conducted generally between June and September during periods that met dry weather conditions. Outfalls to be screened were selected if they were a) 36” inches or greater, (b) within 50 feet of the centerline of named creeks and c) within the full purpose jurisdiction of the City of Austin.

There were 503 outfalls identified by GIS records for screening. Of the 503 screened outfalls, 27 could not be located or were duplicated in the GIS records. Of the 476 outfalls located, 58 were submerged at the time of screening.

Of the 418 outfalls that could be located and were not submerged, there were 71 outfalls with flow less than 1 gallon per minute (gpm) and 18 with flow greater than 1 gpm. Outfalls with flow greater than 1 gpm were investigated further as described below. The source of flow for 8 of the 10 outfalls with flow greater than 1 gpm was determined to be groundwater. Thus, 65% of outfalls screened were dry with no evidence of recent flow. See Appendix G for Dry Weather Field Investigations.

Wet Weather Field Monitoring

The Wet Weather Screening (WWS) was performed during FY 15-16 in accordance with Part III.B.8.b. (1)(2), as part of the Wet Weather Screening Program. WPD FOD staff is responsible for the WWS Program. During this reporting period 2 of the 25 watersheds were screened; East Bouldin and West Bouldin. The Wet Weather reporting sheets are provided in Appendix C.

Industrial and High Risk Monitoring Program

The Industrial and High Risk Monitoring Program is the responsibility of the Pollution Prevention and Reduction (PPR) Section of the Watershed Protection Department. The Stormwater Discharge Permit Program (SDPP) within the PPR Section is responsible for identifying facilities that may fall under TPDES rules and establishing a database of industrial and high-risk facilities discharging to the City's MS4. TCEQ's Central Registry is reviewed at annually for new facilities. SDPP staff did not submit any enforcement referrals to the TCEQ during this reporting period.

Floatables Monitoring Program

During the reporting period, program staff completed periodic inspections at two boom locations on Lady Bird Lake (Shoal Creek and West Bouldin Creek). A total of 1.50 tons of floatable trash and debris were removed from the two locations during cleaning activities.

Water Quality and Biological Monitoring

Rapid Bioassessment Component

The Environmental Integrity Index (EII) (http://austintexas.gov/department/environmental-integrity-index) is the primary routine non-storm, surface water monitoring program of the Watershed Protection Department (WPD) (COA1997), and is a critical piece of the WPD master planning process (COA 2001). The Environmental Resource Management (ERM) Division of the WPD has implemented the EII as a tool to monitor and assess the ecological integrity and the degree of impairment of Austin's creek watersheds.

In accordance with the approved rapid bioassessment monitoring program; the City of Austin performs EII studies on the following four watersheds on a semi-annual rotation: Barton Creek, Onion Creek, Walnut Creek, and Bull Creek. The ERM staff sampled the following Barton Springs Zone watersheds during the FY17 reporting period: Barton Creek and Williamson Creek. (See Table 5). Sample sites within each watershed are selected for each defined sampling reach, with reaches representing contiguous areas of similar geomorphology and anthropogenic impacts. Each watershed is monitored for six index components: water quality, sediment quality, contact recreation, aesthetics, physical integrity, and aquatic life support.

Water quality samples are collected quarterly, and data are collected for all other components once per sampling year. Each of the six components are averaged by site to produce the overall EII score. The aquatic life support score integrates benthic macroinvertebrate data collected using Surber samplers and periphyton (diatoms) collected from rock scrapings. EII scores are reported on 100-point basis and are associated with narrative score descriptions, see (Table 4).

Table 4. Narrative EII score descriptions

Narrative Score	EII Score Range	
	Lower	Upper
Excellent	89	100
Very Good	76	88
Good	64	75
Fair	51	63
Marginal	39	50
Poor	26	38
Bad	13	25
Very Bad	0	12

The EII narrative scores for all the EII watersheds sampled during the reporting period are found in Table 5; watersheds in the Barton Springs Zone of the Edwards Aquifer are indicated with an asterisk (*) and watersheds monitored to fulfill permit requirements have been highlighted. None of the quarterly water quality sampling events at Johnson Creek yielded flowing water conditions, and thus no water quality samples were collected for this watershed during this reporting period. EII sampling was conducted in 25 watersheds see (Table 5, Figure 2). A total of 70 different reaches within the 25 watersheds were visited approximately 5 times for the EII program. The watersheds which required EII sampling this reporting period (Barton and Williamson creeks) are highlighted in Table 5. Data and resulting analyses obtained from monitoring additional watersheds are included for informational purposes only. Data from Onion, Bear, Slaughter, Little Bear, and Little Barton creeks will be submitted in FY 17-18 as part of the two-year rotational cycle of the EII.

Table 5. Total EII scores by watershed for FY 14-15 EII component. Rapid Bioassessment watersheds highlighted. Watersheds containing the Barton Springs Segment of the Edwards Aquifer Recharge Zone noted with an asterisk (*).

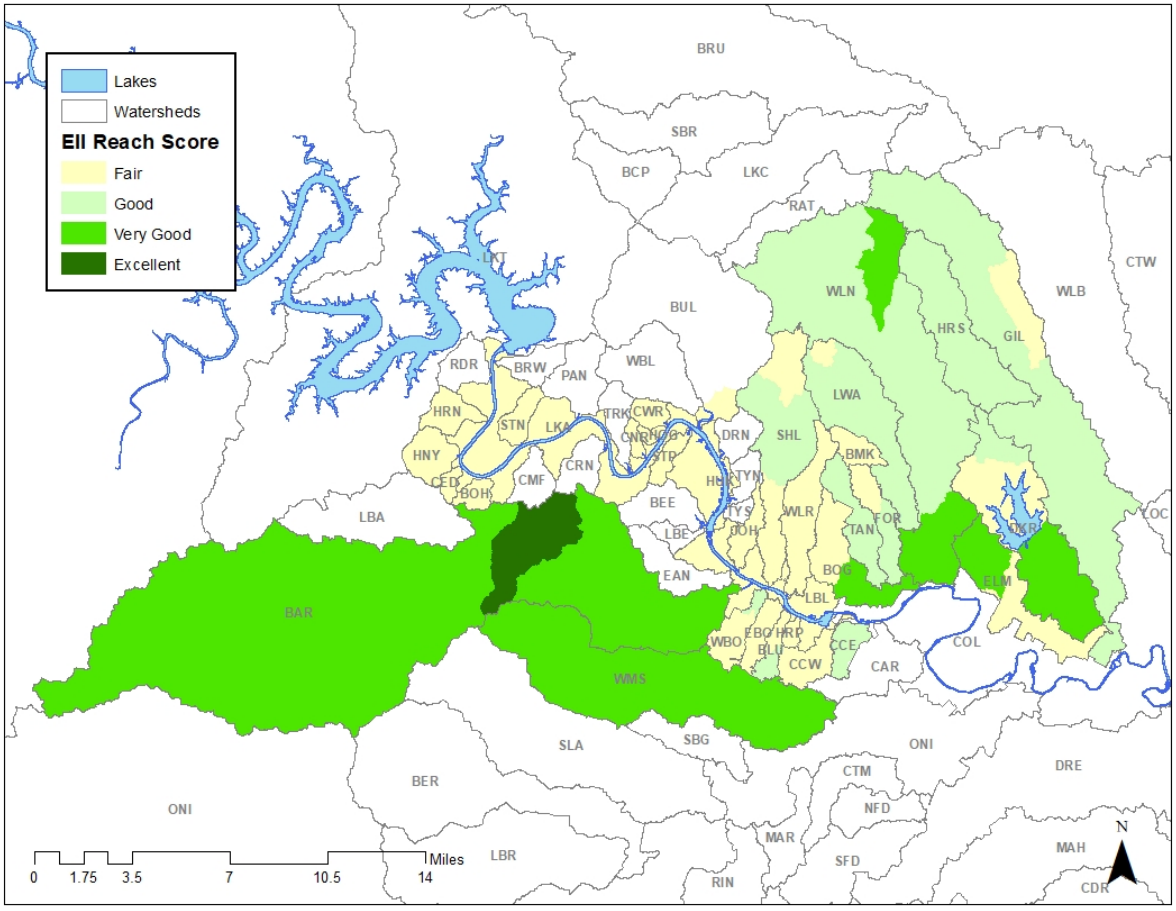
Watershed	Watershed EII Score		Water Quality	Sediment Quality	Contact Recreation	Aesthetics	Habitat	Aquatic Life
Barton Creek*	85	Very Good	76	74	75	97	90	97
Bee Creek West	90	Excellent	81	89	88	96	90	94
Blunn Creek	63	Fair	52	65	34	83	73	69
Boggy Creek	68	Good	51	84	49	76	70	78
Buttermilk Branch	55	Fair	52	72	32	64	47	63
Country Club East	64	Good	49	66	47	73	72	75
Country Club West	62	Fair	64	72	38	60	58	81
Decker Creek	76	Very Good	64	88	76	63	72	90
East Bouldin Creek	58	Fair	48	72	29	69	63	68
Elm Creek	68	Good	64	60	82	76	57	69
Fort Branch	63	Fair	66	81	39	71	49	74
Gilleland Creek	71	Good	37	87	53	84	72	90
Hamilton Creek	82	Very Good	76	88	59	97	77	95
Harper's Branch	53	Fair	42	60	25	87	55	46
Harris Branch	70	Good	44	83	44	88	70	90
Johnson Creek	55	Fair		74		68	39	40
Little Walnut Creek	67	Good	57	79	40	71	64	88
Maha Creek	71	Good	62	85	55	70	76	76
Shoal Creek	58	Fair	56	51	37	76	55	72
Tannehill Branch	69	Good	62	82	47	74	65	84
Waller Creek	55	Fair	46	61	32	76	53	64
Walnut Creek	75	Good	64	79	56	79	78	92
West Bouldin Creek	63	Fair	50	70	39	74	70	74
Wilbarger Creek	76	Very Good	53	86	67	81	83	85
Williamson Creek*	78	Very Good	67	85	72	80	81	85

Current total EII watershed scores indicate that 15 of 25 watersheds did score “good” or better in total overall EII score in the FY2017 reporting period see (Table 5).

Bear Creek West, which flows into Lake Austin yielded highest total overall EII score.

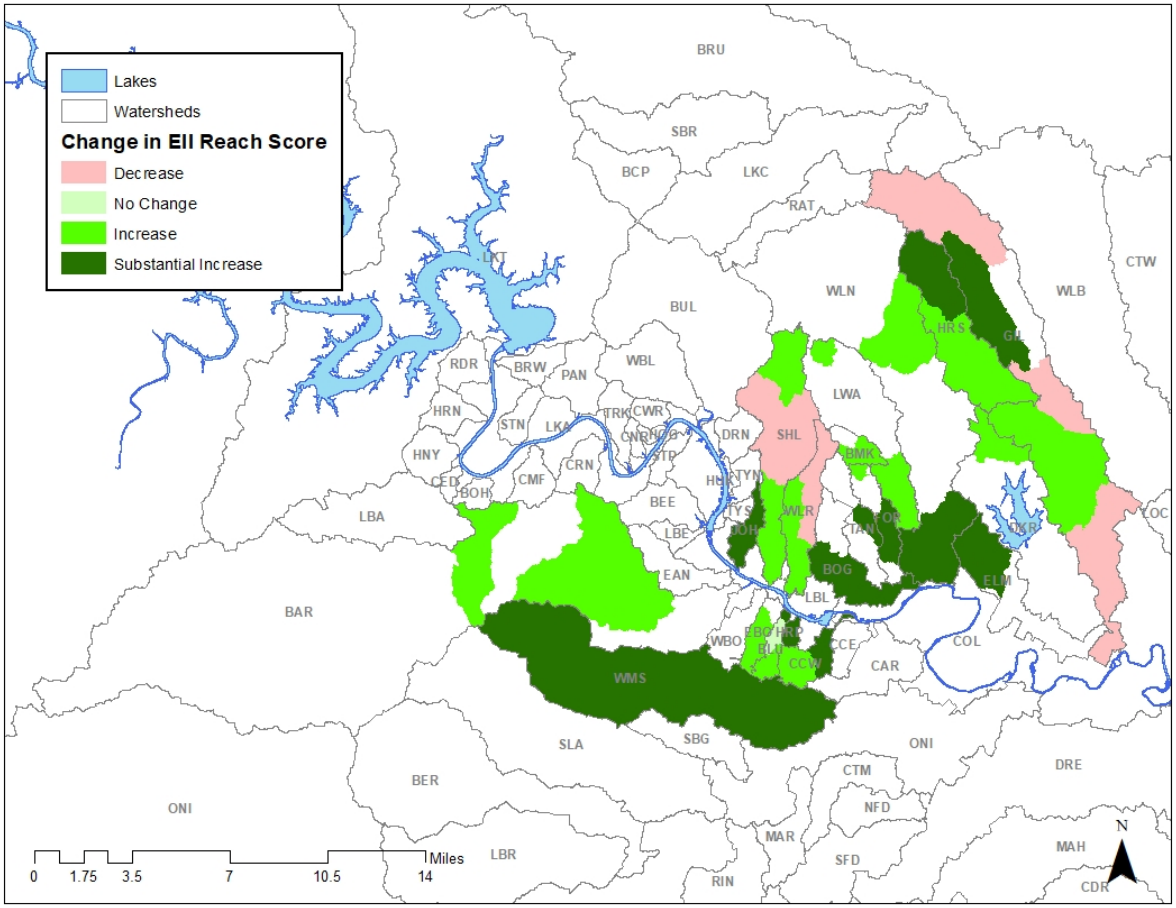
Ten yielded only a “fair” score and Harper’s Branch was the lowest scoring watershed.

Figure 2. Map of FY2017 EII reach total scores. White spaces are watersheds not sampled in this reporting year.



The change in the current EII scores was evaluated relative to baseline conditions established from 1996 to 1999 (Figure 3). Change in a score of more than 12 points represents a significant change of at least one narrative category. There were no significant decreases in EII sampling reach scores relative to baseline levels in the FY2017 reporting period. The maximum decrease in EII scores was -4 points, observed in the Gilleland Creek watershed, a tributary of the Colorado River. Fifteen (15) sampling reaches yielded a substantial positive change. The change in scores from baseline assessments were stable (no change) or improved in 88% of sampled reaches. The overall average change was a plus 10 points.

Figure 3. Change in FY2017 EII reach total scores from baseline sampling year (1996-1999).



Barton Springs Complex Sediment Monitoring

Three sediment samples were collected from within Barton Springs Pool in the FY2017 reporting period. One sediment sample was collected from each of Eliza, Old Mill and Upper Barton springs see (Appendix E). The majority of analytes were less than detection limits as usual. There were no detects of DDT or its metabolites in this reporting period. Multiple polycyclic aromatic hydrocarbon analytes were detected at values above the laboratory reporting limit at multiple locations. ERM staff in FY2016 have completed a new monitoring program to evaluate the spatial and temporal extent of organochlorine and PAH contamination in multiple watersheds in Austin including Barton Creek and published these summary reports in FY2017.

A report on DDT in Barton Springs sediment was published, see link.

http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=276630
http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=283711

Barton Springs Complex Water Quality Monitoring - Biweekly Monitoring

During the reporting period, ERM staff monitored for conventional water quality parameters, including physical parameters and nutrients, yielding a total of 20 samples from Barton Springs see (Appendix F). Nitrate-nitrogen levels were lower in FY2017 with annual average nitrate-nitrogen concentrations of 1.35 mg/L, most likely due to ongoing high spring discharge during the reporting period.

Barton Springs and Associated Springs – Semi-annual and Annual Monitoring

An expanded list of water chemistry analytes was analyzed from Barton Springs on a quarterly basis see (Appendix F). One sample for organic analytes and five samples for ions and metals were collected from Barton Springs in this reporting period. Organic analytes in water at Barton Springs were less than detection limits. Petroleum hydrocarbons have been detected in previous samples at Barton Springs at low levels but were not detected in this reporting period. Tetrachloroethene have been detected in water previously and well samples from other locations in the recharge zone have been evaluated by ERM staff to determine if contaminant plumes may be sourced, potentially related to dry cleaning operations which use the solvent. No detected values of tetrachlorethene were observed in this reporting period.

Additional water quality measures for conventional analytes and physical parameters were conducted four times at Eliza Springs and Old Mill Springs and four times at Upper Barton Springs see (Appendix F). Some metals are not routinely collected for every event at these sites, but all data is reported. One sample was collected from Eliza and Old Mill Springs for an extended list of analytes including organic and volatile parameters in FY 2017 see (Appendix F). All organic analytes in water at Eliza and Old Mill springs were less than detection limits.

Barton Springs Continuous Monitoring

A multi-probe data logger has been continually deployed at a spring-fed cave at the bottom of Barton Springs Pool. The units are serviced every three to four weeks for cleaning and recalibration.

Field parameter and discharge data continues to be monitored by the United States Geological Survey (USGS) in cooperation with City of Austin staff on a 15-minute interval basis and is available real-time via the web (http://waterdata.usgs.gov/tx/nwis/dv?referred_module=sw&site_no=08155500).

Physical parameters including temperature, conductivity and dissolved oxygen, turbidity, pH may be accessed real-time or as daily averages from the USGS website, maintained under contract with the City of Austin. Barton Springs discharge averaged 103.8 ft^3/s during the reporting year higher than the long-term historic average of 62 ft^3/s. A summary of the physical parameters is included in Table 8 below.

Table 8. Multi-probe summary data for FY16-17

Parameter	Units	Mean	Minimum	Maximum	# Days Measured
Temperature	Deg C	21.18	20.3	22	354
Conductivity	uS/cm	652.7	541	668	354
Dissolved Oxygen	mg/L	6.17	5.5	6.7	354
pH	Std Units	6.95	6.8	7.2	354
Turbidity	FNU	1.98	1.4	12	354

Section 5. NPDES & TPDES General Permit Summary Data

5. NPDES & TPDES GENERAL PERMIT SUMMARY DATA

Introduction

As required by Part IV.C.4.d. of the City's permit, a summary of the number of Notices of Intent, Change, Secondary, Termination and Small Construction (CSN) notices received from construction site operators and industrial facilities seeking NPDES or TPDES coverage for storm water discharges, and number of inspections conducted by the City of Austin at construction sites, and industrial facilities during the reporting period from October 1, 2016 through September 30, 2017 has been included in the system-wide annual report as follows. The City of Austin received the following submissions:

TPDES Construction General Permit TXR150000

- 120 Notices of Intent;
- 46 Notices of Termination;
- 124 Construction Site Notices;
- 53 Notices of Change; 31 Secondary Operator Notices.

TPDES Multi-Sector General Permit TXR050000

- 13 Notices of Intent;
- 1 No Exposure Certifications;

TPDES General Permit TXR830000

- 2 Notice of Intent.

Inspections by the City of Austin

- 43,561 construction inspections at permitted development sites;
- 386 industrial inspections at facilities that store hazardous materials; and
- 370 industrial inspections at facilities that may be contributing a substantial pollutant load to the City's municipal storm sewer system (MS4).

Section 6. Annual Expenditures

6. ANNUAL EXPENDITURES

Introduction

As required by Part IV.C.4.b. of the permit, the City of Austin has compiled annual expenditure information for the reporting periods between October 1, 2016 and September 30, 2017 and the anticipated expenditures for the reporting period between October 1, 2017 and September 30, 2018.

Annual Expenditures

The following expenditure information addresses the major elements of the Storm Water Management Program (SWMP). The data reflects current operation budgets of the City of Austin programs utilized to satisfy the TPDES permit requirements. The expenditure information may in some cases include expenses for activities not directly required by the City's permit.

Storm Water Management Program Element	FY 16-17 Actual	FY 17-18 Budget
MS4 Maintenance Activities	50,488,999	74,075,325
[1]Post-Construction Storm Water Control Measures	4,550,089	4,804,835
[2] Illicit Discharges Detection and Elimination	7,994,539	8,789,405
Pollution Prevention/good Housekeeping for Municipal Operation	67,018	68,374
Industrial and High Risk Runoff	1,294,472	1,428,991
Construction Site Runoff	2,334,327	2,766,875
Public Education	1,811,369	2,132,822
Monitoring Programs	784,266	554,215
[4]**Total Expenditures**	**69,325,079**	**94,620,842**

[1]Does not include capital expenditures for construction or retrofit activities.

[2]Does not include capital expenditures for Austin Water.

[4]Total may include expenditures for program activities not directly related to compliance with the City's TPDES Storm Water Permit.

Section 7. Summary of Enforcement Actions, Inspections & Public Education Programs

7. SUMMARY OF ENFORCEMENT ACTIONS, INSPECTIONS AND PUBLIC EDUCATION PROGRAMS

Introduction

As required by Part IV.C.3.d. of the permit, the City of Austin has compiled summary information describing the number and nature of enforcement action, inspections and public education events for the reporting period between October 1, 2016 and September 30, 2017.

Inspection Programs and Enforcement Actions

Various City programs conducted inspections and complaint investigations. A summary of the enforcement and inspection activities of these programs have been summarized below:

Spills and Complaint Response Program

The Watershed Protection Department (WPD) Spills and Complaint Response Program (SCRP) conducted a total of 1,055 incident investigations of which 35 were in the Barton Springs Zone (BSZ). Investigations are conducted to prevent, reduce or facilitate recovery of polluting discharges to the MS4, creeks and lakes from commercial, residential, and industrial sources. As a result of those investigations, SCRP staff initiated 39 enforcement actions citywide, with 5 enforcement actions located in the BSZ. The SCRP staff has continued to work with the criminal prosecutors at the Travis County District Attorney's Office in Austin. During the reporting period, the SCRP staff referred 6 cases for criminal prosecution.

Stormwater Discharge Permit Program

The WPD Stormwater Discharge Permit Program (SDPP) conducted 370 inspections of commercial, industrial, and city facilities in the Full Purpose City Limits, of which 18 are in the BSZ. The activities of these facilities have the potential to discharge

pollutants into the storm sewer system and waterways. As a result of these inspections, 3 enforcement actions were initiated due to non-compliant conditions. No enforcement actions were located in the BSZ. Corrective actions were taken to obtain compliance with the City's water quality code.

Construction Inspection Program

The Development Services Department (DSD) Environmental Inspection Program staff conducted 46,037 inspections at permitted development sites to ensure compliance and proper installation and maintenance of erosion and sedimentation controls, BMP's and on-site Drainage and Water Quality controls. Environmental Inspection staff issued 106 stop work orders, due mostly to inadequate erosion and sedimentation controls. The Environmental Inspection staff filed 111 misdemeanor complaint cases in municipal court (on 33 separate defendants), including 1 Citation.

Underground Storage Tank Inspection and Leak Detection Program

During the reporting period, the DSD Underground Storage Tank (UST) Program issued 8 construction permits; renewed 17 (underground) hazardous materials storage permits (for a 3-year period) and completed 103 inspections in the targeted Barton Springs Zone (BSZ) area.

On-site Sewer System Program

Austin Water (AW) On-site Sewage Facility (OSSF) Program conducted 146 site inspections to ensure compliance with OSSF regulations regarding the installation and modification of on-site sewage facilities. In addition, 108 inspections were conducted to ensure the proper abandonment of existing OSSF. During the reporting period, 10 instances of pollution complaints related to onsite sewage facilities were investigated by AW staff, and 14 notices of violation were issued to address malfunctioning systems and potential permit violations. In addition, AW opened 141 enforcement cases to address maintenance reporting related deficiencies.

Pond Inspection Program

The WPD Field Operations Division (FOD) continued inspection of residential and commercial ponds throughout the permit area for compliance with City code requirements. FOD pond inspection staff inspected 926 residential and 1,974 commercial water quality and detention ponds subject to the City's Land Development Code. The WPD staff mailed a total of 434 Letters of Non-compliance in the effort to resolve problems identified at commercial pond locations throughout the City during inspections. DSD Environmental Inspection Operating Permit Staff for the Barton Springs Zone (BSZ) conducted 1,464 inspections of the 300 permitted commercial water quality controls in the Barton Spring Zone, subject to the BSZ Operating Permit program requirements; with staff issuing 14 letters of non-compliance and 26 corrective action punch lists.

Aboveground Hazardous Materials Permit Program

The Austin Fire Department (AFD) Inspection Services Section conducted inspections at 386 facilities that store hazardous materials. No enforcement actions were necessary to gain compliance.

Inactive Landfill Inspection Program

No new sites or unexpected conditions have been found at any known inactive landfills during the reporting period.

Public Education and Public Involvement Programs

During the reporting period, several City programs conducted public education campaigns that promote water quality protection, pollution prevention, water conservation, and general non-point source pollution.

Water Quality Education Program

CLEAN CREEK CAMPAIGN

The partnership between Watershed Protection Department (WPD) and Keep Austin Beautiful (KAB) has been a very successful partnership. The campaign focuses on one-time creek cleanups, longer commitments through the Adopt-a-Creek program, and in-class education through the Clean Creek Campus program. The Clean Creek Campus, which provides both litter and water quality education to students, reached over 1,656 elementary students with water quality hands-on lessons in the 2016-2017 school year. These students conducted 23 service projects to protect and improve water quality.

The Adopt-a-Creek portion of the campaign continued its enhancement due to the creation of "Grow Zones" along more than twenty creek segments that flow through parks. WPD and KAB collaborate to enhance volunteer restoration protocols to use along these creek segments. During the reporting period educational videos were developed on restoration techniques like planting bare root seedlings. Three English language videos were created that focus on: the benefits of ragweed and when it can be thinned, invasive species removal, and how to make seed balls. Additionally three Spanish language restoration videos were produced. There are currently 104 Adopt-a-Creek groups. See www.keepaustinbeautiful.org and www.austintexas.gov/watershed/creekside.

GROW GREEN

The Interdepartmental Grow Green Team's Landscape Professional Training had 109 citizens attend. Additionally, classes for the public were held in the fall and spring and reached 225 citizens. The group also maintains landscape demonstration gardens at the Zilker Botanical Gardens, Howson Library, One Texas Center office building, and the Parks and Recreation Department headquarters.

An important component of the program is delivering information in a variety of ways including do-it-yourself videos. To date, the mulching video has received more than 7941 views. www.GrowGreen.org

WATER QUALITY EDUCATION PERFORMANCE MEASURES

Through the three, fifth-grade elementary programs, Earth Camp, Teacher-Led Earth Camp and Earth School, the Education group was able to reach most AISD fifth-graders through the following activities during 2016-2017.

- Earth Camp, the four-day outdoor, science-based camp offered to fifth graders in lower socio-economic schools reached 804 students, who showed an improvement in their water quality protection knowledge of 52% between, pre & post-Earth Camp tests.
- Teacher-Led Earth camp, led by classroom teachers who had attended previous Earth Camp sessions reached 794 students.
- Earth School, the in-school fifth grade watershed and aquifer reached 3,839 students in Austin ISD, 565 students in Eanes, ISD, and 377 students in Del Valle ISD.
- Watershed Detectives, a middle school investigative science program: reached 900 students.
- Hydrofiles, a high school aquatic science program: reached 665 students.

WATER QUALITY PUBLIC INVOLVEMENT PERFORMANCE MEASURES

Barton Springs Watershed and Other Watersheds within the Barton Springs Zone

During the reporting period, the Watershed Education Section of the WPD:

- Displayed prominent interpretive signage about the endangered Barton Springs and Austin Blind salamanders, hydrology of the Edwards Aquifer, the history of the springs, and the importance of stewardship at the main entries to Barton Springs Pool.

- Displayed signs in English and Spanish to display at Eliza Spring, Sunken Gardens, and Upper Barton Springs to raise awareness about the endangered salamanders and activities that are not allowed in the area.
- Continued to provide materials such as an audio tour of Barton Springs Pool that citizens can stream on their phones, the "Who's swimming with you?" brochure in both English and Spanish, and Barton Springs salamander masks.
- Provided Grow Green landscaping education that includes a focus on reducing the use of landscaping chemicals by using integrated pest management techniques.
- Continued funding for the Splash! Groundwater education exhibit.
- Designed the "Our Desired Future" exhibit to raise awareness about Texas groundwater issues.
- Installed 73 storm drain markers in the Barton Creek Watershed.

Other Performance measures for 2016-2017 include:

- Grow Green, the landscaping program to benefit water quality**:**
- Number of participating retailers and distribution outlets: 65
- More than 84,000 Fact Sheets distributed.
- 20,746 hits to the Grow Green website.
- Over 52,590 copies of the full color Native and Adapted Plant Guide have been distributed in Austin.
- Integrated Pest Management reviews
  - Staff delivered information at 36 presentations or tabling events.
  - Storm Drain Marking: 1,353 markers were installed throughout the city
- Scoop The Poop, the pet waste cleanup campaign.
  - Over 2,640,000 pet waste bags were purchased during the year.

The Watershed Protection Department (WPD) Pollution Prevention and Reduction Section (PPR), which focuses on pollution prevention education activities, promoted additional public education and awareness programs. During the reporting period the PPR Section accomplished the following:

- East Austin Environmental Initiative (EAEI): One issue of the EAEI newsletter was produced and distributed. The EAEI toured EcoRise award-winning Brooke Elementary. Staff provided an update to the City of Austin Environmental Commission on the remediation of an illegal dumpsite at La Loma/Red Bluff property and on environmental investigation findings at Ebony Acres. Staff promoted a new EPA Brownfields grant given to the City of Austin. Trash and debris dumping educational door hangers were distributed door-to-door in East Austin the Dove Springs area.
- Focused on promotion of our 24-Hour Pollution Hotline. Developed a Hotline marketing/promotion plan, and a new Hotline logo. Promoted the Hotline in the Shoal Creek Conservancy Newsletter, on social media, on web pages, and in Austin Energy's Utility Bill Insert. Placed a Pollution Hotline promotional ad in the fall/winter issue of Austin's Community Impact Newspaper. Added a Hotline promotional ad for the City of Austin's web site and Watershed News. Promoted the Hotline in the annual Austin Preparedness Calendar by designing the page for the month of February with messaging about keeping pollutants out of our storm drains and waterways and timely reporting of illegal activity.
- Developed a new educational brochure called Preventing Stormwater Pollution on Construction Sites. The target audience is construction site workers. The focus is educating contractors in laymen's terms on best practices to prevent polluting discharges during activities such as site dewatering, vehicle and equipment fueling, trash and demolition debris handling, building of structures, and soil disturbance activities.
- Developed a Don't Blow It campaign and posted information on social media that emphasizes keeping leaves and yard debris out of storm drains and waterways. Staff provided an article on this in the Power Plus utility bill insert. Posted information on Facebook and responded to a number of subsequent Facebook comments. Provided written statement on leaf blowing best practices to the Austin Resource Recovery Department so they can answer questions they are receiving on it.
- Austin Enviro-Mechanics (AEM) – AEM is a program that gives incentive and recognition to businesses that contribute exceptional efforts to protect water quality program. Participants were recognized in a Community Impact Newspaper, and various Time Warner Cable media outlets

- Shade Tree Mechanic Program: An initiative aimed at preventing pollution and water quality degradation associated with home automotive repair. Free oil change buckets, educational material and a list of free locations to drop off used oil are all provide to City of Austin residents. If a home auto repair issue is reported to the 24-Hour Pollution Hotline, staff investigates the complaint and meets with home mechanics to educate them on BMP's, water quality laws, and the free oil change bucket for recycling their waste oil. Staff added 31 new participants this year.
- Swimming Pool Outreach: Staff placed over 50 educational door hangers in various neighborhoods where swimming pool backwash discharges have historically occurred. Additionally educational materials were provided to pool operation managers on how to properly manage pools and not create illegal discharges.

Keep Austin Beautiful & Solid Waste Services Anti-litter Education Program

Keep Austin Beautiful (KAB) is a non-profit organization whose mission is to provide resources and education to inspire individuals & the Austin Community toward greater environmental stewardship. During this reporting period KAB was involved in many activities including, but not limited to:

- Facilitated 1366 cleanups utilizing 90,000 volunteer hours, and removing 79 tons of litter.
- Led the Annual Clean Sweep event. During the event, 4,144 volunteers worked at 140 sites in City of Austin and collected 17.5 tons of litter.
- Provided 83 community groups bins through the Event Recycling Program, collecting 4 tons of recycling.
- Supported 220 projects through Tool Shack, engaging 8,840 volunteers, donating 36,270 hours of volunteer time.
- Engaged 577 volunteers in Beautification projects, contributing 1,659 hours of volunteer time.
- Facilitated 56 Adopt-a-Street cleanups, engaging 1,460 volunteers and removing 4 tons of litter.
- Participated in 24 community events including environmental, neighborhood, college and corporate fairs, distributing Keep Austin Beautiful educational materials.

- Distributed a monthly email newsletter to over 10,850 individuals and companies; and a weekly volunteer newsletter to 2,764 individuals and groups.
- Garnered 35,500 unique website visits, 17,700 impressions on twitter daily, and 15,500+ social media followers across platforms.
- Partnered with City of Austin, Travis County, Texas Commission on Environmental Quality, Texas Parks and Wildlife, National Fish and Wildlife Foundation, Keep Texas Beautiful and Keep America Beautiful to raise awareness and educate the community about the importance of implementing environmentally wise practices which ultimately improve the quality of life for all Central Texans.

During the reporting period, Austin Resource Recovery (ARR) Anti-litter Program continued the Pay-as-You-Throw and the curbside recycling campaigns in the effort to educate citizenry and promote recycling. Efforts included promotion of the yard waste pick-up services, the annual Christmas tree recycling event and phone book recycling. ARR also continued promotion of the Household Hazardous Waste Facility through various means including the distribution of an educational flyer. The flyer is written in Spanish and English and indicates the types of materials the facility accepts, the facility's hours, a facility location map and helpful tips related to home chemicals.

Section 8. Identification of Water Quality Improvements or Degradation

8. IDENTIFICATION OF WATER QUALITY IMPROVEMENTS OR DEGRADATION

Introduction

As required by Part IV.C.4.a. of the permit, the City of Austin has reviewed the annual report summary data in the effort to identify any water quality improvement or degradation.

Identification of Improvements or Degradation

Identification of improvement or degradation of water quality can be done directly or indirectly. Because of the limited monitoring period (two years), within the five year permit term, changes in water quality trends are difficult to determine from direct measures of water quality. However, indirect measures of water quality improvements related to the pollution prevention efforts of several City programs have been identified. The following are indirect measures of City's storm water pollutant load reduction efforts during the October 1, 2016 through September 30, 2017 reporting period:

- Collected 4,410 tons of trash, leaves, dirt and debris from roadways throughout the City.
- Properly disposed of approximately 1,872,485 pounds of household hazardous waste.
- Recycled 105,397 pounds of waste oil and 4,400 pounds of oil filters.
- Recycled 333,795 pounds of paint.
- Recovered approximately 284,337 gallons and 554 cubic yards of pollutants as a result of pollution investigations.
- Removed approximately 1.50 tons of floatable trash and debris from two floatable boom locations.

Appendix A

City of Austin
Storm Water Management Program

TPDES Permit No. WQ0004705000 *(EPA I.D. No. TXS000401)*
STORM WATER MANAGEMENT PROGRAM
City of Austin

STORM WATER MANAGEMENT PROGRAM

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Storm Water Management Program

1. MS4 Maintenance Activities

A. Structural Controls

Introduction

The inspection and maintenance programs are part of a comprehensive drainage maintenance plan to identify, evaluate and solve flooding, erosion and water quality problems, including those related to non-point source pollution. The goal of the inspection and maintenance of drainage works program is to ensure satisfactory operation of those facilities and to preserve and enhance the quality of storm water runoff. Specific elements of the current maintenance and inspection program are described below:

Program Activities Description

Maintenance and Inspection Activities

The City's storm water conveyance system is composed of natural and engineered creeks and channels, a network of drainage pipelines, and structural storm water management controls. The Watershed Protection Department (WPD) Field Operations Division (FOD) is responsible for the maintenance of this system, which includes a variety of activities to ensure conveyance for storm water runoff. FOD staff removes excessive vegetation debris and obstructions from open channels and waterways, culvert and bridge locations. The frequency of maintenance activities varies from creek to creek and includes creek bank and flow line stabilization projects as needed to address significant erosion. Routine vegetation control is achieved primarily through private sector maintenance contracts.

FOD personnel also maintain storm drain pipes and inlets. They inspect, clean and repair the system as needed throughout the year to maintain proper operation and conveyance of storm water runoff. The frequency of routine maintenance and cleaning activities varies from location to location based on identified needs.

WPD staff, including FOD and Watershed Engineering Department (WED), inspects storm water structural controls associated with the residential development and City facilities annually. Excess vegetation and any identified structural issues are addressed as necessary to ensure proper functionality. Storm water controls associated with commercial development are inspected on a three year schedule, by the FOD Commercial Pond Inspectors. Any necessary repairs identified are documented, and staff works with the responsible parties to ensure functionality and compliance with City code and criteria.

WPD and Development Services Department (DSD) staff are responsible for the identification and inspection of residential and commercial storm water controls in the Barton Springs Zone, repairing non-functioning residential ponds as necessary and ensuring compliance and enforcement of commercial pond maintenance and repair requirements.

WPD staff will maintain the Department's residential and commercial pond databases in order to ensure more accurate documentation of:

- pond type and function
- inspection records
- maintenance records
- compliance records

Engineering Activities

The WPD project planning process involves procedures to allow for multi-disciplinary review of proposed projects; opportunities for flood, water quality and erosion control needs to be addressed simultaneously (within one project) are identified and discussed prior to project scheduling. The goal is to reduce sedimentation in receiving streams by mitigating erosion in contributing creeks. Erosion control features are incorporated in previously authorized flood control projects whenever that work can address both flood control and erosion control needs simultaneously.

Public Participation

Public involvement in the inspection and maintenance programs will be provided through customer service representatives in the WPD. Citizen complaints, inquiries and requests are assigned to an investigator. If a solution is determined to be feasible and appropriate, the work is assigned to a maintenance unit for action. Critical or emergency situations are dispatched by two-way radio and pagers to a maintenance unit for immediate attention. Citizen input is also received at various public meetings and forums to identify long-term planning needs as well as current drainage problems.

Program Activities Description

The following program tasks will be performed on an annual basis to accomplish the City's inspection and maintenance goals:

- Remove debris and excessive vegetation from approximately 50 miles of open channels to maintain and improve flood flow conveyance and improve water quality.
- Provide scheduled vegetation maintenance at 75% of all storm water controls identified to be the responsibility of the City of Austin.
- Inspect 75% of the storm water controls identified to be maintained by the City of Austin.
- Inspect 1,200 storm water controls associated with commercial development to enforce compliance with City Code.
- Clear at least three miles of open waterways of sediment and obstructions in order to maintain flood flow conveyance, minimize erosion and improve water quality.
- Remove debris, sediment, vegetation and obstructions from at least 500 culvert and bridge locations in order to maintain flood flow conveyance and improve water quality.
- Clean at least four miles (21,120 ft.) of the storm drain pipe system annually to maintain flood flow conveyance and improve water quality.
- Clean at least 2,500 storm drain inlets to maintain flood flow conveyance and remove collected sediment and other pollutants.

The inspection and maintenance program activities may be modified during the permit period as a result of City annexations, development activity and identification

of additional drainage maintenance needs. Additional program changes may be made if efficiencies in operating procedures or costs are realized. Significant increases to service activities that are determined to be critical with respect to the public's safety, health or welfare can be requested through the City's annual budget process to provide funding for that work.

As stated in the introduction, the City of Austin has assumed responsibility for the inspection and maintenance of drainage infrastructure that it either owns or has the legal authority and responsibility to maintain. The City cooperates with adjacent counties, the State of Texas, school districts and the Lower Colorado River Authority to determine appropriate responsibility for inspection, maintenance and operation of the local drainage infrastructure.

B. Floatables Program

Introduction

The City of Austin's floatables program has established collection sites at the mouth of two urban creeks just prior to their discharge into Lady Bird Lake. Each site consists of one boom, made of plastic material that floats at the water surface and extends across the width of the creek to trap floating materials flowing toward the mouth of the creek. Each boom is anchored on either shoreline to maintain its position in the creek.

Program Activities Description

The FOD staff checks the condition of each monitoring site on a weekly basis, and each site is cleaned on a monthly basis if necessary. In addition, FOD staff checks the condition of the sites after major storm events, and removal activities commence when the access areas to the monitoring sites have dried sufficiently to allow the use of mechanical equipment without damage to the surrounding ground. FOD crews remove all trapped floating material using nets that reach the middle of the creek, allowing removal from both sides of the creeks. Heavier material such as wet wood is pulled to the shorelines and removed with mechanical equipment.

The material removed from each site is loaded into City dump trucks, hauled to an acceptable local landfill and measured by weight at the disposal site. The unit of measurement is wet tons. The amount of material removed and taken to the landfill is tabulated on a monthly basis.

Monitoring and Collection Locations

Site Selection

Site selection criteria for the floatables program were generally based on the following:

- Ability to access site in a safe and secure manner
- Public access to creek
- Impact by urban land use activities
- Suitable conditions for boom deployment and cleaning activities

Site Locations

Two urban creeks that receive storm water discharges from Austin's MS4 are used as the collection locations for the floatables program. See Table 6-1.

Table 6-1. Floatables Removal Site Locations

Watershed	Site No.	Monitoring and Collection Site Location	Land Use
Shoal Creek	1	Shoal Creek at Lady Bird Lake	Mixed Urban
West Bouldin Creek	2	West Bouldin Creek at Lady Bird Lake	Residential Urban

Site Descriptions

As noted in the site selection section, each stream used for the monitoring program has been identified as having characteristics that would make it likely to be impacted by urban land use activities and the associated human-generated debris. The following is a more detailed description of each proposed stream, the characteristics of the associated drainage basins and the site selection considerations.

- **Shoal Creek** runs north south through the western portion of central Austin. It is 11.2 miles in length and has a drainage area of 12.9 square miles of highly urbanized development.

The land-use break down for the watershed is 54% residential, 19% business, 9% civic, 6% roadways and 12% undeveloped. Shoal Creek is a highly utilized public resource that passes through several City parks and includes a Hike and Bike Trail that runs the length of the stream. This stream was selected due to the abundance of impervious cover in the watershed, the extensive amount of public use along the stream length and the potential for refuse to enter the stream. Site conditions are suitable for proper boom deployment and continuous operation.

- **West Bouldin Creek** winds through a primarily residential area of south central Austin, is three miles in length and has a drainage area of approximately 2.9 square miles. West Bouldin Creek passes through several parks before entering Lady Bird Lake at Auditorium Shores and has been identified by neighborhood associations as a potential location for greenbelt development. The land-use breakdown for the watershed is 69% residential, 12% business, 4% civic, 3% roadways and 12% undeveloped. This stream was selected due to the abundance of impervious cover in the watershed, the numerous public access locations along the stream, the potential for refuse associated with human activities to enter the stream and the possibility of increased public use in the future. Site conditions are suitable for proper boom deployment and continuous operation.

C. Roadways

A. Roadways Operation and Maintenance Program

Introduction

In the effort to reduce the amount of pollutants discharged into local waterways from streets and roadways, the City of Austin has developed a Roadways Program that addresses snow and ice response, road repair, street cleaning, litter control, and pollutants from traffic.

Program Activities Description

Snow and Ice Response

Snow, ice, and sleet may create unsafe driving surfaces on streets and bridges. As such, the City has developed an emergency response program that uses barricading and sanding to effectively treat slick streets and roadways during the rare ice and snow events. During these events Public Works Department (PWD) staff evaluates the road conditions and identifies the streets and bridges that need to be sanded or barricaded to ensure public safety.

Based on the staff determinations, PWD sand trucks and staff are dispatched to the various locations and appropriate treatment (sanding or barricading) is completed. Once it has been determined that the ice or snow conditions are no longer a threat, PWD will dispatch staff to remove barricades and start street sweeping activities in the areas where sand was used. The PWD will continue to use the described snow management activities during the remaining permit period, although changes to the scope of the program activities may occur during the annual review of the program budget and effectiveness.

Road/Right of Way Maintenance and Repair

Routine maintenance of the streets, bridges, and ROW within the City of Austin are the responsibility of the PWD. The primary maintenance functions of the Street and Bridge Operations Division of PWD include, but are not limited to:

- repairs to potholes, surface replacements and pavement failures
- overlays and leveling of streets
- pavement milling
- crack sealing
- seal coating
- grading and maintenance of unpaved streets and alleys
- removal of debris from the Rights of Way (ROW)
- Bridge repair and management
- Utility excavation repairs, concrete structure repairs

PWD roadway maintenance projects involving excavation are completed under a General Permit issued by the City's Development Services Department (DSD). The General Permit is an "umbrella" work permit issued on an annual basis to City departments and commercial entities operating within the City's jurisdiction under inter local agreements. These entities are typically related to utility and telecommunications services. Work covered involves on-going repair, maintenance and some types of infrastructure extensions within the City's planning jurisdiction. Work to be completed under a General Permit requires written notification to the

General Permit Office, including information concerning the location and duration of the work to be performed, who will be performing the work, contact information and the erosion and sedimentation controls to be used. The PWD General Permit requires the use of erosion and sedimentation controls on all projects and will typically include:

- Temporary inlet protection
- Silt fence
- Rock berms
- Mulch logs and socks
- Stabilized construction entrances
- Work areas dewatering measures;
- Seeding and sodding revegetation measures
- Soil stabilization matting, as appropriate

The controls to be used for each type of maintenance activity are reviewed and approved by DSD staff during the General Permit development process. Inspections by the projects responsible party are also required by City Code. Public Works provides inspections of all projects covered under the general permit. In addition to the project specific controls used, the PWD incorporates storm water control measures at all PWD aggregate stockpile sites, where silt fencing and/or storm water structural controls are located appropriately to provide storm water treatment.

PWD equipment maintenance activities are also conducted under controlled conditions at the equipment yards. PWD staff use approved cleaning materials, good house cleaning practices, proper waste disposal methods and other best management practices (BMP) to minimize the occurrence of non-storm water discharges. Furthermore, the Storm Water Discharge Permit Program (SDPP) of the WPD conducts biannual facility inspections at City of Austin fleet maintenance locations, including the PWD maintenance facilities, to ensure appropriate water quality protection BMPs are being used. Over the five year permit period the PWD will continue the roadway maintenance as described, although changes to the scope of the

program activities may occur during the annual review of the program budget and effectiveness.

Street Cleaning

Routine street cleaning in the City of Austin is the responsibility of the City's Austin Resource Recovery (ARR). The City of Austin Street Cleaning Program targets the cleaning of City streets in all areas within the City limits for removal of trash, litter and dirt that has collected in the streets and gutters for health, safety, aesthetic and water quality reasons.

Each year, this program cleans over 52,955 curb miles of streets in Austin and collects over 6300 tons of trash, leaves, debris and dirt from impervious roadway surfaces. ARR Street Cleaning Program uses regenerative air street sweepers in its operations to clean the streets in Austin. During the permit period, the Central Business District will be swept daily to maximize removal efficiencies. Residential curbed streets will be swept on an average frequency of twice per year. Other areas are swept on varying schedules depending on traffic and need.

Changes or improvements to the Street Cleaning Program may be considered as part of the City's annual operating budget review. In addition, consideration may also be given to conducting controlled studies in selected areas of the City to determine the impact of varying street cleaning intervals on resultant storm water runoff quality.

Litter Control

The Litter Control Program of the City of Austin is the responsibility of ARR, Litter Abatement Division. The Litter Control Program is implemented within the City limits and targets:

- some of the City-owned property within the City limits for removal of trash, litter, and debris which has collected in the streets and the public rights-of-way
- neighborhood cleanups as requested
- brush and bulk pick-up approximately twice per year (Brush and Bulk Collection Program)

- Clean Austin program services high need areas within the city approximately every other month
- trash collection and maintenance for litter receptacles
- removal of dead animals from roadways and public property
- marketing of anti-littering programs in Austin

Programs to control litter are also implemented by the Collection Services Division, which include Pay-As-You-Throw (PAYT) and Curbside Single Stream Recycling. PAYT is a garbage collection system that aggressively encourages recycling and "smart" trash habits. Residents are issued a 24, 32, 64 or 96 gallon wheeled plastic trash cart for their garbage, which is collected once a week. Recyclables are collected every other week, and grass clippings and leaves are collected weekly and taken to Hornsby Bend for composting into "Dillo Dirt." Periodically, there are brush and bulky pick-ups scheduled for neighborhoods which include items such as old furniture, appliances and large tree limbs. PAYT reaches residential and commercial customers through billboards, print ads, utility bill inserts and the City's website.

The Curbside Single Stream Recycling Program provides biweekly collection of newspaper, corrugated cardboard, plastic, glass bottles and jars, tin and aluminum cans and all #1 through #7 plastic containers to all households served by City garbage collection. Qualified commercial customers located in residential neighborhoods also receive collection every other week. The program also includes the Block Leader Program and "Recycling Right" projects to promote public awareness and participation in the program. In addition ARR staff works with other groups on seasonal projects such as Christmas tree recycling, and used oil recycling.
ARR also provides convenient recycling services to all City employees through the workplace recycling program known as "office stream" recycle. This program is continually evaluated to provide the most efficient service, and as a result the frequency of collection may vary.

Program Goals

During the permit period, ARR Litter Abatement Crews will complete the following tasks:

- Litter containers in the downtown area will be emptied of accumulated litter daily
- Litter crews will remove litter from uncurbed streets, uncurbed right-of-ways and other City property as needed
- Illegal dumping of trash and waste material on public property will be removed as necessary
- Dead animals on roadways will be removed, within 24 hours of being reported, six days per week
- Brush and bulk items will be collected on a scheduled basis each year from residences, so that such items do not get dumped along city watercourses
- Street cleaning crews will remove trash, litter and dirt that has collected in the streets and gutters on a scheduled basis

The City does not anticipate any changes to the Litter Abatement Program. However changes to the scope of this program may be considered during review of the City's annual operating budget. Although the City maintains most of the roadways in the Austin area, the Texas Department of Transportation (TxDoT) is responsible for the maintenance, cleaning and closure management of certain State and Federal highways within the corporate limits of the City in accordance with an interagency maintenance agreement.

The City does not anticipate any changes to the Roadways Program. However changes to the scope of the program components may be considered during review of the City's annual operating budget.

2. Post-Construction Storm Water Control Measures

A . Areas of New Development and Significant Redevelopment

One goal of the City's land development process is to protect water quality within the City's jurisdiction. To that end, the City has adopted a number of planning and water quality regulations. Among other things, the ordinances referenced in this section establish effluent limitations and are required, at a minimum, to meet water quality standards.

1. Comprehensive Planning Process

Introduction

The Planning and Zoning Services (PAZ) are responsible for comprehensive planning in the City. Comprehensive planning is done to assure orderly growth, protect environmentally sensitive areas and maintain an efficient infrastructure within the City's planning jurisdiction, which is defined as the areas within the City's territorial and extra-territorial boundaries. Major program areas within Austin's comprehensive planning scope include:

- Implementation of the Imagine Austin Comprehensive Plan (Imagine Austin)
- land use inventories and projections
- demographics and population projections
- neighborhood planning

The land use and population information produced by the PAZ are utilized by a number of City departments for comprehensive planning activities. Comprehensive planning activities are conducted by other City of Austin departments as well. These activities include, but are not limited to the following:

- Implementation of Imagine Austin through the eight identified priority program teams
- Watershed, land use and natural resource studies are conducted by the WPD which is responsible for the development of water quality control programs, planning and design for flood control structures, erosion control and prevention projects and implementation of regulatory controls

- Wastewater facility planning is conducted on an on-going basis by the Austin Water, as part of the City's Capital Improvements Program
- Transportation planning conducted by the Transportation Department
- The base-map maintenance program provided by the Geographic Information Systems Section of the City's Communication and Technology Management Office, which is directed at building and maintaining a uniform land use base map to be used by all utilities and City departments, as one of several on-going planning support programs. Additional mapped data available includes topography, floodplains, geological features and political jurisdictions.

Program Activities Description

The Imagine Austin Comprehensive Plan was adopted by the Austin City Council in June 2012. Informed by broad community input, Imagine Austin provides a vision and roadmap for our community's future. This vision includes ensuring the city "will be safe and affordable; promote physical activity, community engagement, and inclusion; make amenities and services for current and future residents. Imagine Austin is a broad plan covering many areas that when realized will make Austin a better place to live, work, and play. Two major themes of Imagine Austin are "Complete Communities" and "Sustainability." As written in the plan, "sustainability means finding a balance among three sets of goals: 1) prosperity and jobs 2) conservation and the environment 3) community health, equity, and cultural vitality. It means taking positive proactive steps to protect quality of life now and for future generations." Complete communities are "safe and affordable; promote physical activity, community engagement, and inclusion; make amenities and services accessible to everybody, and contribute to Austin's unique community spirit."

To effectively address the themes of sustainability and complete communities, Imagine Austin covers the built and natural environment, economy and equity topic areas. Since its adoption, Imagine Austin has been recognized by peer groups and was honored in April 2014 with the American Planning Association's inaugural "Sustainable plan Award."

This award honors those projects, policies, plans, and people who show exemplary scholarship, leadership and inspiration in sustainability planning and implementation." In order to transform the plan's vision into reality, eight priority programs were identified to provide the structure and direction to implement the plan:

1. Invest in a compact and connected Austin
2. Sustainably manage our water resources
3. Continue to grow Austin's economy by investing in our workforce, education systems, entrepreneurs, and local businesses
4. Use green infrastructure to protect environmentally sensitive areas and integrate nature into the City of Austin
5. Grow and invest in Austin's creative economy
6. Develop and maintain household affordability throughout Austin
7. Create a Healthy Austin Program
8. Revise Austin's development regulations and processes to promote a compact and connected city (also known as CodeNEXT)

The Growth Concept Map was created in tandem with the vision in order to illustrate where and how we should accommodate new growth in alignment with the 8 priority programs. The Growth Concept Map illustrates how Austin should coordinate transportation features roads, transit, and urban trails with activity centers and corridors, in such a way as to reduce degradation of Austin's environmental resources. The map assembles compact and walkable activity centers and corridors, as well as job centers, and coordinates them with future transportation improvements. These centers and corridors allow people to reside, work shop, access services, without traveling far distances. Within them the design and scale of buildings and the design and availability of parks and gathering spaces will welcome people of all ages and abilities. They will be walkable, bikeable, and connected to one another, the rest of the city and the region by roads, transit, bicycle routes and lanes and trails.

The activity centers and corridors included on this map identify locations for additional people and jobs above what currently exists on the ground.

By focusing growth into these centers and corridors, it is hoped that suburban sprawl trends can be reversed which will lead to numerous benefits including environmental. Five centers are located over the recharge or contributing zones of the Barton Springs Zone of the Edwards Aquifer or within Water-Supply watersheds. These centers are located on already developed areas and in some instances provide opportunities to address long-standing water quality issues and provide walkable areas in and near existing neighborhoods. These centers should also be carefully evaluated to fit within their infrastructural and environmental context. One of the Land Use and Transportation policies LUT P21 clarifies the intent, "Ensure that redevelopment in the EARZ and Contributing Zones maintains the quality to improve creek and floodplain protection; prevent unsustainable public expense on drainage systems; simplify development regulations where possible; and minimize the impact on the ability to develop land.

On October 17, 2013 the Austin City Council passed a new Watershed Protection Ordinance to improve creek and floodplain protection; prevent unsustainable public expense on drainage systems; simplify development regulation where possible; and minimize the impact on the ability to develop land. The Watershed Protection Ordinance is the result of a resolution approved by City Council on January 13, 2011. The City held an extensive series of stakeholder meetings with over 200 participants from August 2011 through June 2013 to obtain public input. (See Table 6) and revised (Table 5)

In 2001, the WPD developed a Watershed Protection Master Plan to better prioritize service needs and refine program direction. The multi-phase Master Plan is an on-going effort to inventory existing watershed problems and gauge and mitigate for the impact of future urbanization over a 40 year horizon. Through the Master Plan process, the City assesses technical information to identify erosion, flood and water quality problem areas; prioritizes problem areas; and identifies, evaluates, develops, and implements solutions. Solutions include capital infrastructure projects, operating program enhancements, and regulatory modifications.

Other active planning functions that support water quality planning are demographics and population forecasting and land use planning analysis. The 2000 and 2003 land use data has been collected and correlated with the 2010 census data. Development information that tracks new construction modeling efforts and infill project creation is continuously updated, analyzed and mapped, resulting in a wide variety of development activity trend analysis. PAZ staff has created a 2010 land use inventory.

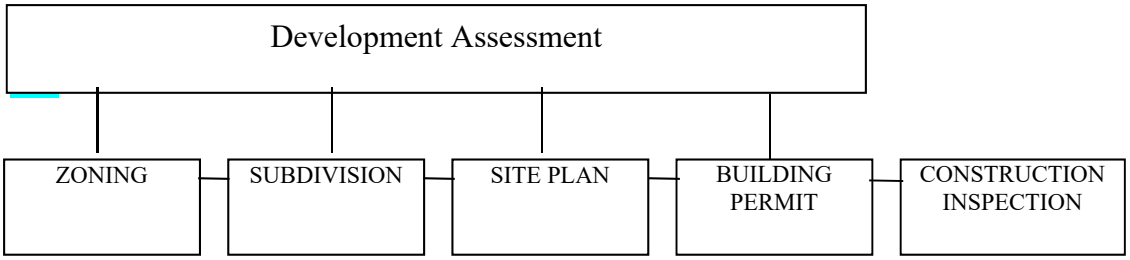
City comprehensive planning activities also include transportation planning. Transportation planning takes into consideration the impacts of water quality regulations on population and land use patterns. The Austin Metropolitan Area Transportation Plan (AMATP) is implemented through subdivision requirements and through the City's Capital Improvements Program. AMATP is being reviewed for possible amendments to reflect recent water quality regulation amendments and effects of the Endangered Species Act on local development within sensitive habitats. Currently, City transportation planning is part of a joint effort with the Capital Area Metropolitan Planning Organization (CAMPO), the designated metropolitan planning organization that coordinates transportation planning in the Austin area. The Austin City Council has four representatives on the CAMPO Policy Advisory Committee, the decision-making authority for CAMPO. Preparation of transportation plans requires close coordination with county governments, other local jurisdictions, CAMPO and the Texas Department of Transportation. The City makes use of boards and Commissions to review projects and make recommendations on a variety of issues before the City Council takes action.

The City of Austin's comprehensive planning programs will continue the various land-use, environmental, and neighborhood and transportation planning activities throughout the permit period. The City does not anticipate any immediate changes to the planning programs. However changes to the scope of the program elements may be considered during review of the City's annual operating budget.

2. Development Regulation

Introduction

New development and redevelopment activities in the City of Austin's planning jurisdiction are subject to internal review for compliance with water quality regulations of the Austin City Code. Development or redevelopment of an individual parcel of land generally undergoes the following review process:



As part of the overall development review process, PAZ reviews zoning cases, and DSD reviews subdivision proposals, site development plan applications and proposed utility projects for compliance with the water quality regulations of the Austin City Code. The planning staff is responsible for the review of water quality related development intensities for various watershed categories and specific water quality and flood control requirements in the City of Austin Code.

The DSD includes development review staff that is responsible for the water quality related aspects of project review, including:

- the general review of new subdivisions for compliance with City drainage standards with respect to structural water quality controls, drainage easements and other proposed drainage facilities; and
- the detailed review of specific water quality control structures, drainage easements and drainage facilities in the construction plans for subdivisions, site development projects and utility projects.

The DSD review staff prepares comments and recommendations regarding the compliance status of each zoning case or development proposal with respect to water quality and drainage codes. If not administratively approved, the comments and recommendations become part of the overall review comment packet prepared for the

Environmental Commission, Planning Commission and Zoning and Platting Commission. The board and commission members consider these staff comments in their deliberations and may hold public hearings, when appropriate, prior to submitting their recommendations to City Council. Tables 2-2, 2-3 and 2-4 at the end of this section provide descriptions of the environmental and engineering development review process functions.

Austin Water's On-site Sewage Facilities (OSSF) division has the primary responsibility for regulation of on-site wastewater facilities. A permit is required to construct any new on-site system. (More information regarding on-site wastewater facilities is provided in the Illicit Discharge and Improper Disposal Section 3).

Austin has an extremely active and environmentally knowledgeable citizenry that participates in the development review process by attending public hearings held by the boards, commissions and City Council. The City Council appoints members to the Environmental Commission, Planning Commission and Zoning and Platting Commission from the City's general public. These commissions address matters of environmental concern to the community by reviewing specific projects, holding public hearings and advising the City Council on priority issues. When making appointments to the boards and commissions, the City Council attempts to strike a balance between members who represent the environmental and the development communities.

The City of Austin has overlapping responsibility for subdivision and site plan review with Travis, Williamson, and Hays Counties for those areas lying outside the City limits but still within the Austin (ETJ). In the past, development permits were required from both units of government in order to proceed. However with passage of HB 1204 (formally known as 1445), that became effective on June 20, 2003, cities and counties must now enter into an interlocal agreement to address subdivision regulatory authority within a city's ETJ. A uniform set of regulations (Title 30 of the City Code) for the Travis County ETJ was adopted on December 11, 2003. Separate regulations have been adopted for Williamson and Hays Counties.

Under most of the agreements, the City retains primary authority for enforcing water quality regulations in the City and the ETJ. Development on state-owned property lying within the City's jurisdiction is not regulated by the City. However, in some cases, a development agreement that addresses water quality issues has been negotiated between the City and the relevant state agency. These agreements typically include provisions for treatment of storm water runoff and maximum levels of development intensity.

3. Zoning, Subdivision, and Site Plan Regulations

Zoning Regulations

Introduction

Zoning districts have been established in order to regulate the type of development that can occur on a certain parcel of land. The land use regulations include the size of yards, courts and other open spaces, the applicable density of population and the location and use of buildings, structures and land for trade, residence and other purposes.

Although not specifically categorized as zoning districts, restrictions to impervious cover levels and/or density have been established by watershed ordinances and included in the Austin City Code. Research shows that water quality protection can be addressed through low intensity zoning districts and through the water quality related development requirements found in the Austin City Code for various watershed categories. Specific water quality zoning districts are not yet in existence in the City of Austin; however, the reduced density or impervious cover requirements of certain base districts or conditional overlay combining districts should provide water quality benefits when located adjacent to or in proximity to waterways. These existing zoning districts include the following: Rural Residential District often used to zone the 100-year floodplain; Development Reserve District; Lake Austin Residence District; and Conditional Overlay Combining District. In addition, the City Code addresses water quality related development intensities for critical water quality zones, water quality transition zones and upland zones.

Even though zoning districts and land uses are not specifically assigned, the impervious cover requirements for the water quality zones and upland zones are limiting factors in the development process. These nonstructural water quality regulations are designed to reduce the impact of development on water quality by providing for control of impervious cover in the drainage basin and buffer zones along watercourses.

Program Activities Description

The DSD and PAZ staff review zoning cases for compliance with water quality related development intensity regulations in the City Code.

This involves review of the following:

- designation of the critical water quality zone and water quality transition zone adjacent to waterways;
- compliance with impervious cover limitations assigned within each water quality zone and the upland zone based on the watershed category and proximity to the waterway given in Table 2; and
- compliance with impervious cover requirements.

Zoning change requests and development proposals are submitted to the Central Intake Facility. At that time, planning staff prepares comments on the proposal within the time frame set by City Code. Comments are made regarding the compliance status of each zoning change proposal with applicable City zoning and water quality related intensity regulations, and include staff recommendations for approval or denial. The project review and comment packet is transmitted to the Planning Commission or Zoning and Platting Commission for action. The commission considers these staff comments prior to submitting their recommendations to City Council. The City Council has the final approval/denial authority on zoning cases. See Table 2 for the zoning/environmental review function description. Currently, all zoning districts have maximum impervious coverage limitations, but zoning code requirements may be superseded by the impervious cover limitations found in the water quality related development intensities in the City of Austin Code.

Subdivision Regulations
Introduction

The subdivision of land involves the division of any lot or parcel of land into two or more lots for the purpose of sale or development, including re-subdivision of existing lots in lawfully platted land. The subdivision provisions in the City of Austin Code regulate the manner in which development can proceed. These subdivision requirements include the development and approval of preliminary plans, the review and approval of final plats and the approval of subdivision layout plans for streets, alleys, sidewalks, block lengths, lot arrangements and lot sizes, the dedication of parkland and the installation of utilities. The subdivision regulations in the City Code require plans for drainage controls and adequate provisions for floodplains. The City Code also gives specific water quality related requirements for development of land within the City's planning jurisdiction.

Proposed preliminary plans, final plats and subdivision construction plans are reviewed for compliance with the water quality regulations of the Austin City Code. The review of preliminary and final subdivision plats involve a general examination of layout design for residential/commercial development and infrastructure. The preliminary or final plat must demonstrate compliance with the intent of subdivision and water quality regulations, so that once site development plans are submitted, the plans are not in violation of or do not require a revision of the final plats. As with site development plan applications, a detailed review of subdivision construction plans both within the City limits and ETJ is conducted to ensure compliance with the water quality regulations described below:

- *Water Quality Related Development Intensities and Water Quality*: Requires that land adjacent to waterways be designated as critical water quality zones and water quality transition zones and sets out specific uses and impervious cover requirements.
- *Drainage*: Allows only very limited open space related development in the 100-year floodplain. New development is generally prohibited, and dedication of the fully developed condition 100-year floodplain as drainage easement is required with all new subdivisions.

Open channel drainage and storm sewer drainage requirements are also found in the City Code. Improvements are prohibited in the Erosion Hazard Zone unless protective works are provided.

- *Environmental Protection and Management and Water Quality*: requires specific structural and nonstructural regulations for water quality protection.

Subdivision proposals for preliminary plans, final plats and subdivision construction plans are submitted to the Central Intake Facility. At that time, DSD staff prepares comments within the time frame set by City Code. Staff comments reflect whether the plans comply with City water quality and drainage regulations, and may include recommendations for approval or denial. The DSD reviews subdivision applications within the City and the ETJ for compliance with water quality regulations regarding water quality zones, impervious cover limitations, erosion and sedimentation controls, tree preservation, site disturbances, cut and fill, water quality controls, spoil disposal, storm sewer discharges, wastewater restrictions, blasting, floodplain modification, industrial uses, roadways, pollution reduction measures and monitoring, where applicable. The WPD reviews applications for compliance with critical environmental features, including wetlands. Table 5 provides summaries of City relevant water quality regulations.

The DSD staff review the preliminary designs of water quality control structures and the provisions for drainage easements (including 100-year floodplains) in the subdivision applications. In addition, review staff estimate fiscal obligation requirements for water quality controls and erosion and sedimentation controls. Once all staff review has been completed, the project review and comment packet is transmitted to the appropriate boards and commissions. See Table 3 for the subdivision/environmental review function description. The subdivision review program, as currently organized in the DSD, will continue to function and be enforced as described above within the City's Full Purpose jurisdiction and ETJ. New administrative rules will be developed and implemented as needed. City Council initiatives for development of more water quality protection ordinances could occur in the future, but specific enactments cannot be foreseen at this time.

Site Development Plan Regulations

Introduction

In the City of Austin, multifamily or commercial development on a specific parcel of land requires the approval of a site plan and release of a site development permit. Site plans involve two primary elements, the land use element and the construction element. Review authority for the land use site plan extends to the City's full purpose limits, but the City's authority to review the water quality and drainage element extends to the City's planning jurisdiction (ETJ).

The earliest watershed ordinances for Austin have been in existence since 1974. Current water quality regulations in the Austin City Code were developed as part of the 1986 Comprehensive Watersheds Ordinance (CWO), and amended by the 1991 Urban Watersheds Ordinance. As part of the citizens Save Our Springs (S.O.S.) initiative to further protect the Barton Springs Zone, additional water quality regulations were adopted by City Council. Austin water quality regulations apply in the City's planning jurisdiction. Since 1980, City watershed ordinances have included water quality regulations for drainage from development. These apply within the City and ETJ. The early ordinances regulated density/intensity of development to protect water quality and in some cases required the use of nonstructural controls, structural controls, or both to minimize the impact of storm water that drains off development.

The CWO, adopted in 1986, combined environmentally related site development and subdivision regulations into one document, thereby combining water quality regulations for all non-urban watersheds within the City five-mile ETJ in one document. The CWO, as amended and codified in the Austin City Code, contains the current water quality regulations used for site development plan and subdivision plan review; in the Barton Springs Zone, additional code requirements apply. Table 5 gives a brief summary of current City structural and nonstructural water quality control requirements.

The Watershed Protection Ordinance passed by Austin City Council October 17, 2013 amended the CWO; the SWMP was revised in 2014 year to reflect the changes, significant improvements like increased waterway setbacks and erosion hazard zones, Site plans must also comply with the other water quality related regulations, including those related to water quality related development intensities, landscaping and tree preservation, drainage controls and floodplain provisions and specific on-site water quality factors.

Program Activities Description

Applications for site development permits are submitted to the Central Intake Facility. At that time, DSD staff review the site plans and prepare comments within the time frame set forth by City Code. Staff comments reflect whether the plans comply with City water quality and drainage regulations, and include recommendations for approval or denial of the development permit. Administrative approval of site plans may occur if the site plan complies with City Code and if it does not involve a conditional use, the Hill Country Roadway requirements, or variances. If variances are requested, the project review and comment packet is transmitted to the Environmental Commission, Planning Commission and Zoning and Platting Commission for action. The Environmental Commission considers these staff comments prior to submitting recommendations to the Planning Commission, Zoning and Platting Commission and City Council. The approval authority for site plans involving conditional uses and the Hill Country Roadway lies with the Planning Commission or Zoning and Platting Commission. In some limited circumstances, decisions regarding variances to site plans may be appealed to the City Council. The DSD reviews the land use element of site plans for site design and layout to ensure compliance with water quality zone requirements, with development intensity and impervious cover limitations (which also have water quality effects), for impacts on "the natural and traditional character" of the landscape, landscape ordinance, tree protection ordinance, and for compliance with the City's Floodplain Modification Guidelines.

The construction element of site plans is reviewed for the structural and nonstructural water quality control requirements, as summarized in Table 5. The DSD staff review the structural design of water quality control structures proposed in the site plans. The design and maintenance criteria for these systems are specified by the City in the Environmental Criteria Manual. In addition, grading and the provision for drainage and drainage easements (including the 100-year floodplain) is reviewed. The Erosion Hazard Zone is reviewed for development within 100 feet of waterways with more than 64 acres of drainage.

See Table 5 for the environmental site plan review function description. See Table 6 Watershed Protection Ordinance Regulations Summary Table. The site plan review program, as currently organized in the DSD, will continue to function and be enforced as described above within the City's planning jurisdiction.

Table 2. City of Austin Zoning Process within the City Limits

Submittal	To DSD Intake
Environmental Regulation Review Elements	*Development:* Intensity Density *Environmental:* Water resources/quality Floodplain/flooding Critical environmental features Existing trees Significant slopes greater than 15%
Review Authority	DSD PAZ Planning Commission Environmental Commission Zoning and Platting Commission
Notice	Property owners within 500 feet Registered neighborhood organizations within 500 feet Utility Customers within 500 feet Public hearings notification through sign posting and newspaper advertisements
Approval Authority	City Council
Product	Zoning change

Table 3. City of Austin Subdivision Development Process within City Limits and ETJ

Submittal	To DSD Intake
Environmental Regulation Review Elements	*Design and Engineering:* Lot size and layout Drainage and floodplains Erosion Hazard Zone Runoff controls and water quality controls *Environmental:* Water quality zones Impervious cover calculations Non-structural water quality controls Structural water quality controls Critical environmental features Existing trees Significant slopes greater than 15%
Review Authority	DSD Environmental Commission Planning Commission Zoning and Platting Commission
Notice	Property owners within 500 feet Registered neighborhood organizations within500 feet Utility customers within 500' Public hearings notification through sign posting and newspaper advertisements (preliminary plan only)
Approval Authority	Planning Commission Zoning and Platting Commission DSD & PAZ Director
Product	Preliminary plan Final plat Released subdivision construction plan

Table 4. City of Austin Site Plan Process*

Submittal	To DSD Intake
Environmental Regulation Review Elements	*Design:* Intensity Density Setbacks *Environmental:* Water quality zones Impervious cover calculations Non-structural water quality controls Structural water quality controls Critical environmental features Existing trees Significant slopes greater than 15% Landscape requirements *Construction:* Drainage and floodplains Erosion Hazard Zone Runoff controls and water quality controls
Review Authority	DSD Environmental Commission Planning Commission Zoning and Platting Commission
Notice	Property owners within 500 feet Registered neighborhood organizations within 500 feet Utility customers within 500 feet Public hearings notification through sign posting and newspaper advertisements
Approval Authority	Planning Commission for: Hill Country Roadway site plans Conditional use site plans Variances Administrative approval for all others if complying with City Code

Table 5. Summary of Water Quality Regulations in the Austin City Code, Chapter 25-8 Relative to the Watershed Protection Ordinance (Applicable Within City and ETJ)

General Standards – Chapter 25-8, Subchapter A	
Critical Water Quality Zones (CWQZ)	Establishes CWQZs along creeks with drainage basins over 64 acres as well as the shorelines of lakes and rivers. The geometry of the buffer can vary with the size of the contributing drainage area and the watershed classification. Most waterways are classified as minor, intermediate, or major. Development or alterations within the CWQZ is prohibited, with exceptions for limited roadway
Water Quality Transition Zones (WQTZ)	Established WQTZs parallel to all CWQZs, except for waterways in the Urban and Suburban watersheds. Width differs depending on type of waterway. Limited development and impervious cover is allowed within WQTZs depending on watershed category.
Construction on Slopes	Prohibits roadways or driveways on slopes over 15% unless providing access to flatter slopes. Prohibits structures on slopes over 25%. Allows structures on slopes between 15-25% if less than 10% impervious cover on slopes of 15-25% with containment and terracing.
Erosion & Sedimentation Controls (ESC)	Requires ESC for all construction and development within all watersheds. ESC plan must comply with standards in the City of Austin Environmental Criteria Manual.
Clearing and Temporary Site Disturbances	Limits survey width to 15 feet. Limits length of time between rough cutting and surfacing/stabilization to 18 months. Limits roadway clearing to twice the surface width. Required in all watersheds.
Cut and Fill	Prohibits cut or fill over four feet except for within roadway rights-of-way and for structural excavation. Not applicable within Urban watersheds.
Water Quality Controls	Requires water quality controls to capture, and treat runoff from all contributing areas in all watersheds. Innovative runoff management practices must be reviewed and approved by WPD. Requires water quality controls for all development in the Barton Springs Zone and for greater than 8,000 square feet of impervious cover in all other watersheds
Optional Payment-In-Lieu of Structural Controls	Allows developer the option to request authorization to deposit a cash payment with the City in lieu of constructing onsite structural water quality controls. Applicable only with Urban watersheds.
Floodplain Modification	Floodplain modification is permitted if the modifications are necessary to protect public health and safety; would provide a significant, demonstrable environmental benefit; are necessary for development allowed in the CWQZ; or are located outside of the CWQZ in an area determined to be in poor or fair condition by a functional assessment of floodplain health.
Impervious Cover	Impervious cover is defined as the total area of any surface that prevents the infiltration of water into the ground, with exceptions for things like trails, water quality controls, and pools. Limits in upland areas vary by watershed classification.

Redevelopment Exception	Properties that meet all the requirements of the redevelopment exception (e.g., no increase in impervious cover, install water quality controls) do not have to comply with the rest of the requirements of Section 25-8 Subchapter A. The Redevelopment Exception varies by watershed regulation area.
Spoils Disposal	Prohibits spoils sites in 100-year floodplains or on slopes over 15%, with some exceptions. Sites require reasonable access, restoration, and revegetation. Required in all watersheds.
Critical Environmental Features (CEFs)	Requires 150-foot setbacks from bluffs, springs, canyon rimrocks, caves, sinkholes, karst features, and wetlands. Setbacks may be administratively reduced upon inspection by staff geologists/biologists in WPD. No wetland protection in the central business district.
Wastewater Treatment	Wastewater treatment by land application prohibited on slopes greater than 15 percent, in a critical water quality zone, in a 100-year floodplain, on the trunk of surveyed trees, in a CEF buffer, or during wet weather conditions.
Storm Sewer Discharges	Allows issuance of a certificate of occupancy only if it is in compliance with requirements of Discharges to Storm Sewers or Watercourses of the City Code.
Additional Standards	
Environmental Resource Inventory	Requires an environmental resource inventory in accordance with the Environmental Criteria Manual regarding hydrology, vegetation, wastewater treatment, critical environmental features, and storm water runoff and pollution abatement.
Overland Flow	Requires maintenance of overland flow patterns, natural drainage features and dispersion of runoff to sheet flow whenever possible.
Blasting	Restrictions placed on blasting for projects in CWQZs or WQTZs over the Edwards Aquifer Recharge Zone and within 300 feet of critical environmental features.
Industrial Uses	Requires pollutant attenuation plans and refers to City Code storage design requirements for hazardous materials. Requires detention of storm water onsite and filtration before discharge.
Roadways and Driveways	Requires alternative designs for streets in water quality transition zones, minimum lot sizes and lot frontage and reasonable driveway access relative to design, grades and joint use.
Wastewater Treatment	Wastewater treatment by land application prohibited on slopes greater than 15 percent, in a critical water quality zone, in a 100-year floodplain, on the trunk of surveyed trees, in a CEF buffer, or during wet weather conditions.
Storm Sewer Discharges	Allows issuance of a certificate of occupancy only if it is in compliance with requirements of Discharges to Storm Sewers or Watercourses of the City Code.

Table 5. Continued

Additional Standards for Watersheds in the Barton Springs Zone	
Impervious Cover Limits	All percentages listed are maximums allowable values calculated on a net site area basis. 15% is allowed over the Recharge Zone. 20% is allowed over the Barton Springs Contributing Zone within the Barton Creek Watershed. 25% is allowed over the remaining portion of the Barton Springs Contributing Zone.
Pollutant Load Restrictions	Requires that runoff be managed and treated such that no increases occur in the average annual loadings of total suspended solids, total phosphorus, total nitrogen, chemical oxygen demand, total lead, cadmium, E. coli, volatile organic compounds, total organic carbon, pesticides, and herbicides from the site.
Pollution Reduction Measures	Impervious cover must be reduced if needed to assure compliance with pollutant load restrictions.
Critical Water Quality Zones (CWQZ)	Boundary of the CWQZ shall not be less than 200 feet from the centerline of a major waterway, or less than 400 feet from the centerline of the main channel of Barton Creek. No pollution control structures or residential or commercial buildings may be established within the CWQZ.

Note: Pre-existing and non-conforming development approvals are subject to the grandfathering provisions of ordinance No. 20140612-084 which may be amended from time to time.

Table 6. City of Austin Watershed Protection Ordinance Regulations Summary Table
Effective: October 28, 2013

Red Text = Change from Previous Requirements

REGULATORY CATEGORY	ZONE	DESIRED DEVELOPMENT ZONE			DRINKING WATER PROTECTION ZONE		
		Urban	Suburban City Limits	Suburban N. Edwards / ETJ	Water Supply Suburban	Water Supply Rural	Barton Springs Zone
Impervious Cover (IC)	Calculation Basis	Gross Site Area	Gross Site Area	Gross Site Area	Net Site Area	Net Site Area	Net Site Area
	Transfers Allowed	No	Yes	Yes	Yes	Yes	No
	Uplands: Max Pct IC	Max Pct	Max Pct Std / w Transfer	Max Pct Std / w Transfer	Max Pct Std / w Transfer	Max Pct Std / w Transfer	Max Pct [No Transfers]
	Single-Family Res. (Lot > 5750 ft²)	No Watershed IC Limit: Zoning Limits only	50% / 60%	45% / 50%	30% / 40%	1 unit per 1 ac. / 1 unit per 2 ac.*	R / BC / C ** 15% / 20% / 25% for all uses
	Single-Family Res. (Lot < 5750 ft²)		55% / 60%	55% / 60%			
	Multi-Family Residential Max Pct		60% / 70%	60% / 65%	40% / 55%	20% / 25%	
	Commercial Max Pct		80% / 90%	65% / 70%			
						* Min lot ¾-acre; ½-acre with transfers; Clustering: 1 unit/ac max; 2 units/ac w transfer	** R = Recharge Zone BC = Barton Creek Contributing C = Other Contributing
	WQ Transition Zone Max Pct IC (outside floodplain)	Not Applicable	Not Applicable	Not Applicable	18%	1 SF unit / 3 acres	1 SF unit / 3 acres None over recharge
	Critical WQ Zone: Max Pct IC	None (except road crossings)	None (except limited road crossings)	None (except limited road crossings)	None (except limited road crossings)	None (except limited road crossings)	None (except limited road crossings)
	Critical Environmental Feature (CEF) Max Pct IC	None within 150 to 300 ft radius	None within 150 to 300 ft radius	None within 150 to 300 ft radius	None within 150 to 300 ft radius	None within 150 to 300 ft radius	None within 150 to 300 ft radius
Waterway Classifications	Minor	64 acres	64 – 320 acres	64 – 320 acres	64 – 320 acres	64 – 320 acres	64 – 320 acres
	Intermediate		320 – 640 acres	320 – 640 acres	320 – 640 acres	320 – 640 acres	320 – 640 acres
	Major		over 640 acres	over 640 acres	over 640 acres	over 640 acres	over 640 acres
	Notes	Urban creeks not classified					
Waterway Setbacks	Critical Water Quality Zone						
	Minor	50 – 400 ft. No CWQZ Downtown	100 ft.	100 ft.	50 – 100 ft.	50 – 100 ft.	50 – 100 ft.
	Intermediate		200 ft.	200 ft.	100 – 200 ft.	100 – 200 ft.	100 – 200 ft.
	Major		300 ft.	300 ft.	200 – 400 ft.	200 – 400 ft.	200 – 400 ft. (Barton mainstem 400 ft.)
	Notes	Between min and max width, coincides with the 100-year fully-developed floodplain	"Buffer averaging" allows sites to reduce width of buffers by up to one-half if the overall amount protected remains the same		Between min and max width, coincides with the 100-year fully-developed floodplain		
	Water Quality Transition Zone						
	Minor	Not Required	Not Required	Not Required	100 ft.	100 ft.	100 ft.
	Intermediate				200 ft.	200 ft.	200 ft.
	Major				300 ft.	300 ft.	300 ft.
	Variances from Buffers	Administrative under certain conditions	Must apply for Land Use Commission variance		Must apply for Land Use Commission variance.		
Water Quality Controls	Treatment Standard	Sedimentation/ Filtration	Sedimentation/ Filtration	Sedimentation/ Filtration	Sedimentation/ Filtration	Sedimentation/ Filtration	Non-Degradation
	When Required	All new/redeveloped if IC > 8,000 sq. ft.	All new/redeveloped if IC > 8,000 sq. ft.	All new/redeveloped if IC > 8,000 sq. ft.	All new/redeveloped if IC > 8,000 sq. ft.; all IC in WQTZ	All new/redeveloped if IC > 8,000 sq. ft.; all IC in WQTZ	All development
	Allowed in Creek Buffer	CWQZ = Yes per ECM WQTZ = N/A	CWQZ = Yes per ECM WQTZ = N/A	CWQZ = Yes per ECM WQTZ = N/A	CWQZ = No WQTZ = Yes per ECM	CWQZ = No WQTZ = Yes per ECM	CWQZ = No WQTZ = Yes per ECM
	Alternative Strategies Allowed	Yes	Yes	Yes	Yes	Yes	No
	Optional Payment-in-Lieu	Yes	No	No	No	No	No

key: CWQZ = Critical Water Quality Zone; ETJ = Extra-Territorial Jurisdiction; IC = Impervious Cover; SF = Single-Family Residential; WQ = Water Quality; WQTZ = Water Quality Transition Zone

B. Flood Control Projects

1. Existing Flood Control Retrofit Program

Introduction

The WPD Watershed Engineering Division evaluates storm water structural controls throughout the City's MS4 to determine if retrofitting is feasible.

Program Activities Description

Although historically many structural flood control devices have been implemented through the City's Regional Storm Water Management Program (RSMP), many other flood and water quality controls were built through private development. The WPD will evaluate the existing RSMP flood control structures (regional detention ponds), non-RSMP flood control structures and other urban sites as potential flood/water quality retrofit locations. Each of the identified facilities will be assessed utilizing the following site evaluation criteria:

- General size and layout
- Critical or constraining environmental features
- Topographic constraints or opportunities
- Drainage area size and pollutant load
- Opportunities for BMP integration with existing features
- Community acceptance

The following are examples of the water quality technologies that may be considered for use at each identified facility as determined practicable by the City:

- Permanent wet pool
- Bio-retention systems
- Extended detention

Erosion detention and base flow augmentation may also be considered for use in combination with these water quality technologies. Cost effectiveness of retrofit activities will be taken into account during the evaluation process to determine implementation priority.

Program Schedule

Evaluations and consideration of flood/water quality retrofit potential will continue at each of the identified structures throughout the five-year permit period. No specific schedule will be set for the retrofit evaluation process as it will be done in conjunction with other master planning processes, to be based on a needs assessment currently underway.

2. Future Flood Control Review Program

Introduction

In the effort to assess the potential water quality impacts from proposed flood control projects, the City of Austin uses both regulatory design requirements and technical review to evaluate both municipal and private flood control projects.

Program Activities Description

City of Austin Land Development Code (LDC) currently requires an Environmental Assessment (EA) be filed with the director of the WPD for any proposed development located in a floodplain. This includes both City and private flood control projects such as large regional detention facilities and any type of floodplain modification. The requirements of the EA include a Hydrogeological Report which must demonstrate that the proposed drainage patterns resulting from the construction of the project will protect the quality and quantity of recharge at significant points. The EA must also include a Vegetation Report, a Wastewater Report, and a Pollutant Attenuation Plan for any proposed industrial use that is not completely enclosed in a building.

For both City and private flood control projects, the flood control facility design and the accompanying EA are submitted with the permit application and reviewed by WPD staff. The proposed project must also comply with the requirements of the City's LDC, Environmental Criteria Manual (ECM) and Drainage Criteria Manual (DCM). LDC and ECM codes and rules require project impacts to water quality and riparian systems to be evaluated and minimized. The DCM outlines design, performance and safety criteria for storm water management.

As part of the Master Plan, WPD's MIP Team will integrate, to the greatest extent possible, flood control, erosion control and water quality goals into future WPD projects. Currently, all WPD flood control projects meet LDC, ECM and DCM requirements and include evaluations of opportunities to incorporate erosion control and water quality design features.

During the five-year permit period the City of Austin will continue to evaluate proposed flood control projects as outlined above, with more refined evaluation and assessment criteria to be developed based on the Master Plan activities. The City does not anticipate any changes to the flood control programs. However changes to the scope of these programs may be considered during review of the City's annual operating budget.

3. Illicit Discharges and Improper Disposal

A. Illicit and Allowable Discharges

Ordinance

To effectively prohibit illicit discharges to the municipal separate storm sewer system (MS4), the City of Austin uses a series of ordinances. The City code sections that address illicit discharges and improper disposal are as follows:

Water Quality Regulations

Title 6, Chapter 6-5. Water Quality

The chapter 6-5 Water Quality regulations of the Austin City Code contain regulatory language that prohibits non-storm water discharges into storm sewers or water courses and provides requirements for pretreatment, monitoring and specifications related to specific activities. In addition, provisions for inspection by the City and penalties due to violations are included in this chapter.

Watershed Regulations

Title 25, Chapter 25-8. Environmental

This chapter of the Austin City Code contains language that prohibits illegal connections to the storm sewer system or any other illicit discharges at newly constructed facilities. Section 25-8-362 (Storm Sewer Discharge) of the Chapter states: "A certificate of occupancy may not be issued for development subject to this subchapter unless the development is in compliance with Chapter 6-5, Article 5 *(Discharges Into Storm Sewers Or Watercourses)*."

Hazardous Materials Storage and Registration Regulations

2003 International Fire Code

The Austin Fire Department enforces the 2003 International Fire Code (IFC) to regulate hazardous materials storage and registration in the City of Austin. Included in IFC is regulatory language that prohibits the discharge of materials into the storm sewer or watercourses. Section 2703.3 of the IFC states: "Hazardous materials in any quantity shall not be released into a sewer, storm drain, ditch, drainage canal, creek, stream, river, lake or tidal waterway or on the ground, sidewalk, street, and highway or into the atmosphere."

The City of Austin also has amended sections of the IFC to include provisions for reporting emergencies and cost recovery. In addition, the Fire Department requires adherence with Section 6-5-51 of the City of Austin Code.

Litter Regulations

Title 10, Chapter 10-5. Litter

Chapter 10-5, Article 3 of the Austin City Code prohibits litter. Section 10-5-42 (Littering Prohibited) of the chapter states: (A) A person commits an offense if the person deposits or throws litter on a street, alley, sidewalk, premises, vacant lot or public property, including a park or playground.

(B) A person commits an offense if the person deposits or throws litter along a street, alley, sidewalk or public property, including a park or playground.(C) A person commits an offense if the person deposits or throws litter from cleaning the interior of a residence, business or premises on a street, alley, sidewalk or creek."

On-Site Sewage Facility Regulations

Title 15, Chapter 15-5. Private Sewage Facilities

Chapter 15-5 of the Austin City Code provides regulations for sewage facilities. Section 15-5-26 (discharge or spill) of the chapter provides specific guidelines for reporting and cleanup activities so that appropriate action is taken to "protect public health and the environment."

Enforcement

The City investigates illicit discharges on a complaint or emergency response basis and on the results of the dry weather screening activities. Investigations of suspect facilities or activities include a thorough inspection of the premises and the connections to the MS4 to determine if an illicit discharge has occurred, or if the potential for illicit discharges exists. When an illicit discharge is found, City investigators work with the responsible party(s) to obtain voluntary compliance with City Code requirements. If voluntary compliance cannot be achieved, legal action can be taken against the violators in Municipal Court (See Prosecution). Illicit discharges to the storm sewer system found during routine facility inspections conducted by other City programs are addressed by the investigator conducting the inspection. If the illicit discharge cannot be addressed in this manner, the problem will be reported to the Pollution Hotline for follow-up inspection and investigation. In addition, other City field staffs have been instructed to follow the proper procedures for reporting illicit discharges.

Municipal Court Prosecution

If voluntary compliance is not obtained, evidence of the violation, including investigation reports, photo documentation of the violation and all correspondence with the responsible party is obtained for the DSD Environmental Inspection Legal Enforcement Liaison and City's Law Department staff. The DSD legal enforcement liaison will then file a complaint in Municipal Court and work with a prosecutor to prepare the case against the violator and any responsible party(s).
The City's Law Department prosecutes environmental cases, as necessary in Municipal Court, and in most cases Chapters 25-8 (Land Development Code) and 6-5 (Water Quality Code) of the Austin City Code are cited as the legal mechanism for prosecution.

Violations of Chapters 6-5 and 25-8 are Class C misdemeanors, finable up to $2,000 per violation. The penalty and fines imposed by the Municipal Court Judge are generally based upon the recommendation of the City Prosecutor, but in most cases a plea bargain is negotiated and a "deferred disposition" verdict is reached. In such cases, the defendant may be required to post a $1,000 bond that will be returned upon completion of the court ordered cleanup or corrective activities. If the defendant corrects the violation in the negotiated time frame to the satisfaction of the investigator and the court then the charges will be dropped from the defendant's record. If the defendant fails to comply with the court Order, a "revocation hearing" will be held, at which time the judge will rule on the case. Depending on the court ruling, bond money may not be returned and additional fines may be assessed. New charges may be filed against the defendant the next working day (as the violation of City Code still exists), beginning the process again.

Criminal Prosecution

During a site investigation or inspection of a permitted site in Travis County, if the investigator determines criminal or malicious intent associated with a violation, the investigation may be referred to the Travis County District Attorney's Office for

possible criminal prosecution under Texas Water Code Section 7.145. As with municipal prosecution, staff provide Travis County officials with evidence of the violation, reports, photo documentation and any correspondence with the responsible party. Travis County then conducts a thorough review of the evidence and determines if there is enough evidence to support filing criminal charges in County court. A violation of Texas Water Code 7.145 is a Class B misdemeanor. Fines of between $1,000 and $100,000 as well as jail time of up to five years are possible for a responsible party, if found guilty. If Travis County determines that there is not enough evidence to support prosecution, the case is handed back to WPD investigators for further investigation or possible prosecution in Municipal Court (see Municipal Court Prosecution above).

Referral to the TCEQ

During a spill investigation or a site inspection of a permitted site in Williamson County or Hays County, if the investigator determines criminal or malicious intent associated with a violation, the investigation may be referred to the TCEQ for possible prosecution under Texas Water Code Section 7.145. Furthermore, if a responsible party is unwilling or financially unable to mitigate an illicit discharge, notification to the TCEQ is made for legal enforcement and/or possible mitigation funding.

B. Detection and Elimination of Illicit Discharges

Wastewater Pipelines

Introduction

The City's wastewater collection system (separate from the storm water system) is operated and maintained by the Pipeline Operations Program. Austin Water (AW) who is responsible for inspection and repair of wastewater infrastructure within the utility's service area.

Program Activities Description

Austin Water (AW) continues its active Operation and Maintenance (O&M) program that includes cleaning, TV inspection, and smoke testing to clean and identify public and private defects in the collection system. In addition AW continues to repair and improve the collection system and has an emergency response plan that includes emergency crews and contractors available 24 hours a day, 7 days a week. These O&M activities as well as improvements and emergency response resources to the collection system have continued to reduce the number of overflows and their duration. AW has installed permanent flow monitoring equipment with telemetry at its major wastewater interceptors to monitor significant sources of inflow and infiltration (I&I). The utility conducts Sewer System Evaluation Survey (SSES) studies for the collection system in the drainage basins of its wastewater service area. The collection system located within the Edwards Aquifer Recharge Zone (EARZ) is televised once every five years to comply with the Texas Commission Environmental Quality (TCEQ) Edwards Aquifer Rules. In addition to the closed circuit TV inspection required by TCEQ, the utility also cleans the wastewater lines and inspects manholes located in the EARZ.

Interceptors in creeks are “walked” for visual inspection of any damage after indication of significantly high flows. The utility uses television trucks for conducting closed circuit TV inspection of its wastewater lines. Sources of infiltration and seepage that cannot be eliminated through the routine maintenance are evaluated as part of a SSES to determine the best method of rehabilitation/repair/replacement. Illegal connections of storm sewers to sanitary sewers are removed as soon as they are detected during the various monitoring activities such as flow monitoring, sewer cleaning, TV inspection, smoke testing, dye testing and creek walking. Any illicit discharge of sewage or wastewater from a private or public system may be reported to the Austin Water or WPD Pollution Hotline by the public. The City’s Spills and Complaint Response Program (SCRP) of the WPD investigate any Pollution Hotline reports of overflows that threaten to discharge to a storm sewer or waterway.

As noted in the introduction, SCRP staff is responsible for determining the source of illegal discharge such as wastewater discharges into Austin waterways, and enforcing regulations preventing these discharges.

The Plumbing Inspection Division of the DSD enforces appropriate provisions of the plumbing code relative to on-site sewage piping and connections. In addition Austin Water has a division called Utility Development Services (UDS) who has a team that investigates wastewater issues related to private laterals. This team works on the resolution of stop-ups, back-ups, and SSO's on the lateral side. The Austin city code requires customers to repair sections of their private plumbing that are not per code or functioning properly. UDS has legal authority to require homeowners to repair their private plumbing using the Private Lateral (PLAT) program.

AW and SCRP staff may also coordinate with other governmental agencies, such as the TCEQ, and/or the Environmental Protection Agency (EPA) during emergency spill incidents.

During the five year permit period, the City's program to prevent the infiltration or seepage of wastewater from wastewater lines into its storm sewer system and waterways will be responsible for completing the following of activities each year:

- Clean wastewater lines
- TV inspection of wastewater lines
- Smoke test wastewater line interceptors
- Provide routine maintenance of wastewater lines as necessary
- Replace or rehabilitate wastewater lines as necessary

C. Overflows and Infiltration

On-site Sewage Facilities (Septic Systems)

Introduction

The Water Department of the City of Austin (Austin Water) regulates On-Site Sewage Facilities (OSSF"s) Utility located within the City's jurisdictional boundaries for OSSF's. The City's jurisdictional boundaries include the City's corporate limits and areas annexed for

the implementation of the Health and Safety code. The Texas Commission on Environmental Quality (TCEQ) has granted authority to Austin Water to enforce the requirements established in Title 30 of the Texas Administrative Code (TAC) Chapter 285 and has approved additional requirements under City Code 15-5 article I for the regulation of OSSF's. The focus of the OSSF program is to abate and/or prevent pollution and injury to the public health from the inadequate treatment and disposal of on-site treated sewage.

Program Activities Description

The OSSF Program uses a multi-step process to reduce or prevent illegal discharges of improperly treated on-site sewage into the city's municipal separate storm sewer system. Potential unpermitted discharges include but are not limited to; seepage/infiltration and runoff of partially treated effluent and/or raw wastewater. To increase public protection and prevent the introduction of partially treated effluent into the environment, Austin Water amended Chapter 15-5 on October 3, 2013. The effective date of the revised ordinance was November 1, 2013. The revised ordinance included more stringent design and monitoring requirements for OSSF.

Properties with an OSSF in which the property owner is seeking to obtain a building permit from the City of Austin must be evaluated for potential impacts to the OSSF before a building permit can be issued. Design plans for the installation of new or modified systems installation requirements. The current City code does not require existing OSSF to be abandoned unless the systems are failing (e.g., the OSSF are known sources of pollution, nuisance conditions and/or a threat to public health, or when the system is altered).

The City may inspect OSSF reasonably believed to be causing pollution. Enforcement action may be taken for any non-compliant OSSF. Enforcement actions may include citations for failure or refusal to remedy conditions prohibited by City Code. Violations of City Code may be issued through the appropriate municipal court. Violations of the City Water Quality Code, which include any un-permitted or illicit discharges of sewage or wastewater from a private or public system, into a storm

sewer system or waterway are reported to City's WPD Spill Complaint Response Program (SCRP). The SCRP is responsible for determining the source of illegal discharges such as wastewater discharges to storm water sewers, evaluating the impacts of such discharges to Austin's waterways and enforcing regulations preventing these discharges.

When necessary action may be taken through Municipal Court to enforce these provisions of the City Code. Additional remedies available to the City include; but are not limited to, the temporary disconnection of water and/or electric services to non-compliant sites. Austin Water also coordinates enforcement activities with several other local agencies such as the TCEQ, the Lower Colorado River Authority (LCRA), Travis County Transportation and Natural Resources Department and the Williamson County Health District on an as needed basis. For example, the TCEQ may assist with the enforcement of special regulations for the construction of wastewater systems over the Edwards Aquifer Recharge Zone, and the LCRA may assist with regulations regarding private sewage facilities near Lake Travis and the other Highland Lakes.

The effectiveness of the City's program to prevent the infiltration or seepage, or runoff of partially treated wastewater into its storm sewer system and waterways will be measured through several indirect means, including:

- the number of new OSSF's permitted and inspected;
- the number of enforcement actions taken against poorly maintained OSSF's with advanced treatment systems (secondary and tertiary);
- the number of investigations and enforcement actions taken to correct failing OSSF's ; and
- the number of complaint responses related to illegal discharges from private sewage systems.

D. Household Hazardous Waste and Used Motor Vehicle Fluids

Introduction

The City's Austin Resource Recovery ARR is responsible for the development and management of the City's Household Hazardous Waste (HHW) Program. These programs fall within the disposal services operational area. In October 2015, the HHW Program was combined with the Resource Recovery Center (RRC) to become the Recycle and Reuse Drop Off Center (RRDOC). Within the umbrella of the RRDOC the HHW still operates in the same manner as before with a staff of environmental professionals. Staff members provide the day-to-day operations and management of the facility and program.

The City of Austin's HHW Program serves the residents of Austin and Travis County, Texas. Funding is primarily from the City ARR customers, although 10-15 percent of program participants come from Travis County outside the City's service area, and Travis County contributes close to 10 percent of the annual program budget. The program focus is on decreasing pollution from indiscriminate use or disposal of home chemical and used oil, thus preventing pollution of local watersheds. Citizens from surrounding counties may use the program's services, although they must pay a fee for the use. Publicity is provided through local newspapers and other news media, and talks provided to area schools, professional organizations and environmental conferences. With the assistance of the TCEQs Pollution Prevention and Education Section, and the North American Hazardous Materials Management Association (NAHMMA), information on the operation and success of Austin's program is made available to communities throughout Texas and the United States.

This program continues to benefit Austin and Travis County residents by providing convenient, responsible disposal options so that hazardous household wastes are removed from the City's and County's regular liquid (sanitary sewer) and solid waste streams. Proper disposal of hazardous waste also decreases this category of material from being disposed of in vacant yards, easements or storm sewers.

Removing flammable, caustic or explosive hazards from solid waste collections contributes to a safer work place for sanitation workers and lessens risks for fire fighters. Program awareness and participation also helps make homes safer. Public education efforts are detailed in Section 7, Public Education and Involvement.

Program Activities Description

Household Hazardous Waste Program

The HHW Program consists of a daily collection program at a permanent solid waste transfer facility, and customers who require home pickups or other accommodations will be helped throughout the week. Household battery collection and recycling through numerous area stores, latex paint recycling through numerous area stores, latex paint recycling and distribution, and reusing safe, good quality products in a product reuse program will continue.

In October 2015, the HHW Program expanded to include the Resource Recovery Center (RRC) and became the The Recycle and Reuse Drop-off Center (RRDOC). This new name and larger scope of services increased participation dramatically. The Household Hazardous Waste Program is fenced separately per TCEQ requirements. The RRDOC takes Styrofoam, rigid plastics, appliances, electronics, single stream recycling and brush from the public. Additionally the facility will operate the ReUse store. In December 2016 the RRDOC will started collecting textiles as well. Although the City can no longer accept Conditionally Exempt Small Quantity Generator (CESQG) wastes, as 30 TAC 335 Subchapter N disallows this practice, CESQG customers will be provided a list of vendors. The City of Austin's HHW Program operations will be reviewed to maximize waste reductions and enhance recycling whenever possible.

City of Austin staff accepts and segregates waste into approved shipping containers for storage until the disposal contractor can transport the waste for disposal or recycling. Mixed solvents, antifreeze, oil, and latex paint will be bulked into drums (or storage tanks for oil and antifreeze) during collection hours.

Oil-based paint is packaged into cubic yard boxes. A qualified, permitted hazardous waste transporter and disposal contractor is present, on a weekly basis, to further segregate the collected material, manifest, package and transport collected wastes for disposal at U.S. EPA licensed disposal facilities. Collected waste will be stored at the HHW Facility in accordance with Title 30 Texas Administrative Code (30 TAC) Chapter 335 Subchapter N.

Paint Recycling Program

Another successful program under the HHW umbrella is the latex paint recycling program. Part of the segregation operation at the facility includes determining if latex paint, which is dropped off, is in usable condition. Good latex paint is poured into two separate containers to make up white, green and dark latex paint. The City of Austin has a contract with a local paint company to blend and package the latex paint into 3.5 gallon containers. It is given to the general public 501(c) groups for building projects, to the Physical Graffiti Abatement Program of the Austin Police Department and to other groups deemed candidates for the paint.

Public Education Involvement and Intergovernmental Coordination

Another key component to the success of the HHW Program will be continued public involvement and coordination with other government entities. The City's HHW Program works closely and coordinates program planning and implementation with the TCEQs Pollution Prevention and Education Section. Notification of any HHW collection program is required 45 days prior, and a full operational plan with specific regulatory requirements is required to be available on site for any HHW collection. For permanent sites such as Austin's, the notification is required to be updated periodically (typically annually) while the operational plan is updated as changes occur within the program. The City will also continue to work closely with the LCRA and Travis County. As noted previously, Travis County contributes funds to pay for the county's share of hazardous waste transportation and disposal costs and additional employees to handle the workload in managing HHW from County residents outside

the City. The county and the City have agreed that County funding contributions to the program will be based on the percentage of participation coming from areas in the county outside the City limits.

E. MS4 Screening and Illicit Discharge Inspections

Introduction

The primary goal of the illicit discharge inspection program is to detect the source of illicit discharges to the City's municipal separate storm sewer system (MS4) in the effort to prevent or minimize the impact to water quality or other natural resources in the Austin area. This goal will be achieved through investigation of portions of the MS4 identified as potential sources of non-storm water discharges due to illicit connections or improper disposal practices.

Program Activities Description

The illicit discharge inspection program is based primarily on the activities of the SCRP of the WPD. The SCRP staff investigates reports of illicit discharges to the storm sewer system. The SCRP investigators track the route of an illicit discharge and attempt to identify its source and cause. The standard procedures for conducting illicit discharge investigations have been summarized in the following outline (Figure 6-1).

The SCRP staff maintains written documentation on all illicit discharge investigations. The documentation will include, as necessary, information such as field observations, potential responsible party information, causes, sources, specific violations (or potential violations) observed, response action requested and final resolution. Incident reports are kept in a computer database that can be queried by map grid, watershed, facility name and various other pertinent fields. Any supporting material acquired during the investigation, including MSDSs, photos, phone logs or waste manifests are kept in respective hard copy incident files.

Illicit discharge investigation and inspection activities are not scheduled; rather they are initiated as warranted by the dry weather screening program referrals or reports of

illicit discharges or improper disposal practices submitted by citizens, other City departments or agencies. The City does not anticipate any changes to the illicit discharges and improper disposal program, however changes to the scope of the various program components may be considered during review of the City's annual operating budget.

F. NPDES and TPDES Permittee List

The SDPP staff has implemented a database of industrial and high-risk facilities discharging to the City's MS4. SDPP staff utilizes the TCEQ NOI database, and information from field inspections to maintain the database. Summary data is reported annually in Section 5 of the System-wide Annual Report.

G. MS4 Maps

The WPD maintains a Geographic Information System (GIS) feature class of the mapped MS4 system. This information is continually updated and MS4 system maps are produced upon request.

H. Spill Prevention and Response

Introduction

This program seeks to protect the water quality of streams and related natural resources in Austin. This program targets illegal or illicit discharge to the storm sewer system and spills of hazardous and non-hazardous materials, which might be a threat to water quality within the City's planning jurisdiction and water supply watersheds. Discharges may occur through illicit plumbing connections to the City's storm sewer system, deliberate dumping or accidental spills of hazardous and non-hazardous materials. This program will work to reduce the number of these discharges by tracking and eliminating illicit connections, enforcing state and local statutes regarding illegal discharges and responding to accidental spills to monitor material containment and clean-up.

The responsibility for responding to surface water quality complaints and hazardous and non-hazardous materials spills for water quality protection is held by the WPD, ERM Division, Pollution Prevention and Reduction (PPR) Section. The Austin Fire Department (AFD) is responsible for responding to hazardous material spills for protection of human health and safety. AFD also responds to certain non-hazardous materials releases that may be a threat to life, property, or the environment. The TCEQ is responsible for regulating disposal of hazardous waste.

Program Activities Description

The WPD maintains a rapid response capability by having investigators on-call on a rotating basis, and after-hours notification of environmental emergencies is accomplished through a 24-hour hotline operated by the WPD. In a typical response situation, the Spills and Complaints Response Program (SCRP) investigators are notified of hazardous material incidents by the AFD dispatch office. Occasionally, this notification is from the TCEQ or the Austin and Travis/Travis County Health and Human Services (HHSD). Water pollution complaints are received from many sources: directly from private citizens calling the department's Pollution Hotline, and referrals from other City departments such as the ATCHD or AW and referrals from other regulatory agencies such as TCEQ or LCRA. Figure 7-1 shows the procedures for conducting an investigation and Figure 7-2 describes each procedure.

The SCRP classifies incident investigations into two different categories: Priority Incidents and non-priority incidents. “Priority Incidents” are generally emergency spill incidents and situations that pose an immediate threat to water resources. “Non-priority incidents” are general environmental complaints that do not pose an immediate threat to water resources. SCRP investigators respond to priority and non-priority incidents within the scope of WPD programs. However, when the investigators note other problems outside their jurisdiction, they will refer them to other departments or agencies for action as appropriate.

SCRP investigators attempt to obtain voluntary compliance with applicable water quality regulations when violations are found. If unable to obtain voluntary compliance with City regulations, WPD staff has the option of filing complaints against the responsible party(s) in municipal court. Uncooperative offenders are referred to the TCEQ or EPA for enforcement as well. Criminal investigations where necessary are referred to Travis County Attorney's Office. Ultimate enforcement may be through one or more City departments or external agencies as their jurisdictions apply. Investigators in this program work with a large number of regulatory entities, including interactions with government organizations at the federal, state, county and local level. It is the policy of the WPD to provide all possible cooperation with these agencies, and SCRP staff meets periodically with the different agencies to discuss cooperation and coordination, lines of communication and areas of jurisdiction.

In addition to the spill and complaint response activities, the SCRP staff provides a data retrieval service for industry and interested citizens seeking data on spills and complaints. Investigation reports are recorded from a field notebook into a computerized database. Materials gathered during an investigation, such as photographs, reports, correspondence and Material Safety Data Sheets (MSDS) are kept in an investigation file. Information requests under the Freedom of Information Act are also received from businesses, citizens and the media.

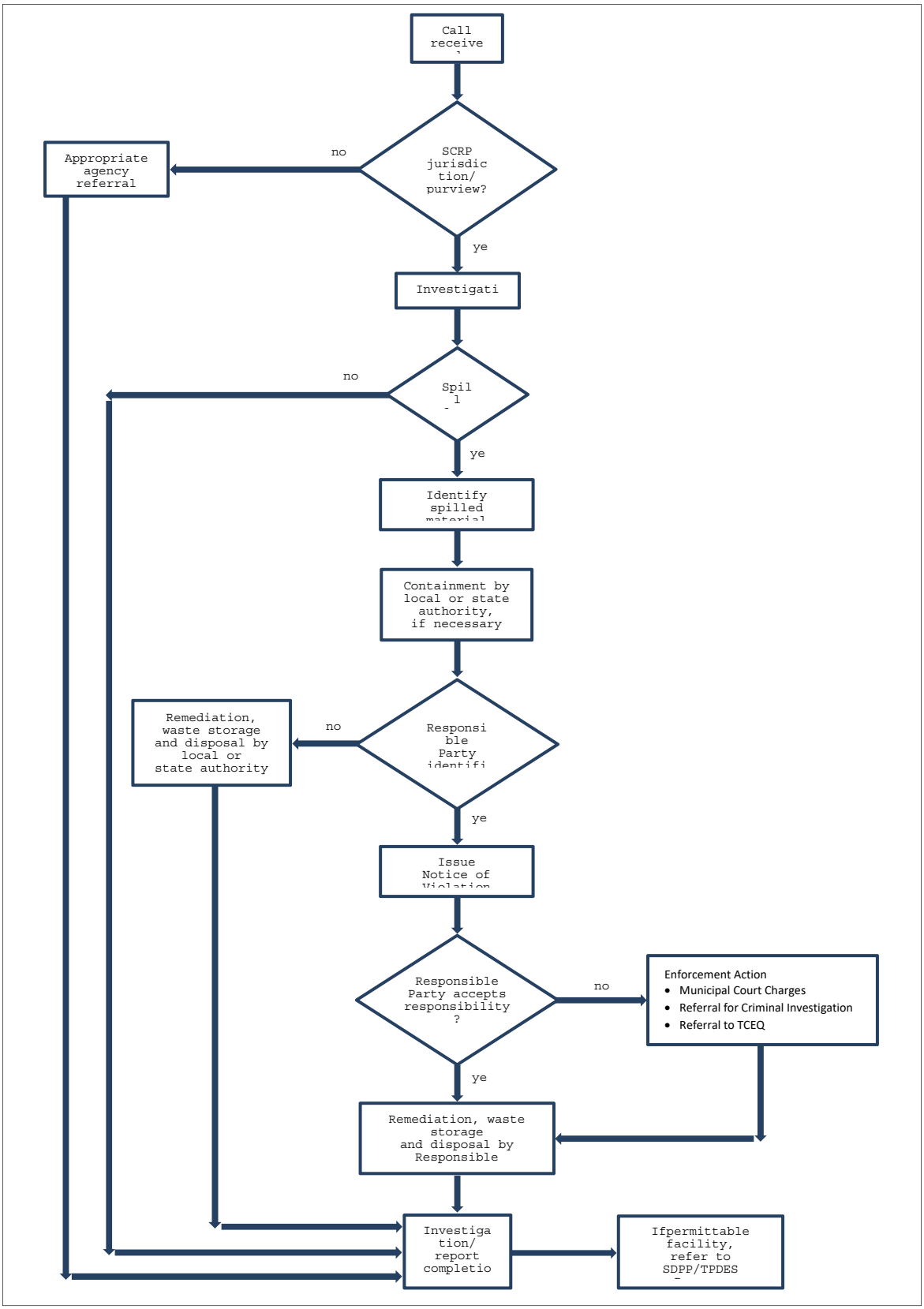
Program staff also provides an educational service by offering information to regulated businesses, City departments that work with WPD and citizens groups. This information is provided in the form of written handouts and staff presentations. Currently handouts include general program description, regulatory contact information, good housekeeping and spill clean-up procedures, and waste recycling information.

During the permit period, the SCRP will continue spill and complaint response activities. However the program expects to see continued growth in the number of investigations. This increase is expected to be due in part by efforts to increase community awareness of environmental issues and the City's pollution prevention

programs. Enhanced public awareness may be achieved through the development of educational materials for public distribution, working with local media and marketing program staff and giving public presentations to targeted organizations.

The WPD currently sponsors a youth monitoring program that monitors the water quality of local streams, creeks and lakes. These young citizens are an excellent source of routine information on polluting discharges to storm sewers and watercourses, and have been briefed on how to contact the SCRP in the event that they observe a polluting discharge while in the field. These efforts are expected to increase the number of spills and pollution problems reported to the program, thereby increasing the amount of pollutants (i.e. spill residues) removed from the environment.

Figure 7-1. Spill and Complaint Response Process Flow Chart



Over the five-year permit period WPD will continue to seek advanced training opportunities to expand emergency response personnel knowledge and experience in addition to maintaining the current level of training, which includes:

- Hazardous Materials Operations and Emergency Response 40 hour course (satisfies OSHA 1910.120)
- In house training using staff resources, training manuals, videos, WPD safety liaison and various reference manuals
- Various conferences, workshops and seminars related to spill clean-up techniques, disposal of contaminated materials, federal and state environmental regulations, emergency response, and investigation techniques, and other related subjects such as confined spaces and rail car releases

Periodic review of the City the Water Quality Code, which regulates discharges to storm sewers and watercourses, may also occur during the five year permit period to consider whether modifications are appropriate.

Figure 7-2. Spills and Complaints Response Program Investigation Procedure

CALL RECEIVED
- Call is received by WPD Spill and Complaint Response Program Investigators through the City of Austin
- 24-Hour Pollution Hotline.

SCRP JURISDICTION / PURVIEW?

Yes:
- Investigator prioritizes call according to potential environmental impact, and responds to calls in order of priority.

No:
- Refer to appropriate agency (see *Appropriate Agency Referral*).

APPROPRIATE AGENCY REFERRAL
- Refer to appropriate agency.
  For example: Austin Health and Human Services Department, Travis County, TCEQ.

INVESTIGATION
- Review information reported.
- Check and prepare equipment anticipated for the investigation.
- Mobilize to Site.
- Observe from safe distance and approach with caution from upwind direction, if necessary.
- Establish contact with potential responsible party(ies) and/or other agency representatives. Present credentials, explain authority and purpose of investigation.
- Record observations in field notebook, documenting violations or potential violations.

SPILL FOUND?

Yes:

- See *Identify Spilled Material.*
- Assess general properties of material spilled to determine method of initial containment, if necessary.
- Evaluate environmental impact(s).
- Coordinate with other agencies and contractors, if necessary.
- Collect samples, if necessary.
- Communicate applicable regulations and associated legal responsibilities to suspected or potential responsible party(ies).

No:

- Verify spill / complaint information with caller.
- Gather all pertinent information and evidence if a spill is suspected, but not found.
- Communicate applicable regulations and associated legal responsibilities to suspected or potential responsible party(ies).
- Complete investigation report (see *Investigation / report completion*)

IDENTIFY SPILLED MATERIAL

- If material is not positively identified by observation, consult resources such as: AFD, Safety Data Sheet(s), Chemtrec, Emergency Response Guidebook, other reference books.
- Take appropriate safety precautions for exposure to material.

CONTAINMENT BY LOCAL OR STATE AUTHORITY

- AFD conducts initial spill containment when material is a public hazard.
- SCRP Investigator conducts initial spill containment when material is an immediate threat to a storm sewer or watercourse, but is not a significant public hazard.

Figure 7-2. Spills and Complaints Response Program Investigation Procedure *continued*

RESPONSIBLE PARTY IDENTIFIED?

Responsible party is person(s) or business causing the illegal discharge. If no responsible party is identified, the owner of the property on which the material is spilled is responsible. Unknown property ownership is determined by accessing City of Austin utility records or county tax records.

Yes:

- See *Issue Notice of Violation.*

No:

- See *Cleanup, storage, disposal by local or state authority.*

REMEDIATION, WASTE STORAGE AND DISPOSAL BY LOCAL OR STATE AUTHORITY

- When no responsible party is identified, and if necessary, local or state authority (e.g. WPD, AFD or TCEQ), or contractor hired by local/state authority, performs remediation, waste storage and disposal.
- SCRP Investigator makes recommendations on remediation methods, sample parameters, waste storage and disposal methods, etc.

ISSUE NOTICE OF VIOLATION

- Verbally issue notice of violation and request for remediation.
- If violation is a repeat-offense, egregious, neglectful or malicious, or the Responsible Party is absent, issue a written Notice of Violation with a compliance deadline.

RESPONSBILE PARTY ACCEPTS RESPONSIBILITY?

Yes:

- See *Remediation, storage and disposal by Responsible Party or RP contractor*.

No:

- See *Enforcement Action.*

ENFORCMENT ACTION

- Notify personnel necessary to begin enforcement process, potentially including WPD management and COA legal staff and superior authorities.
- SCRP Investigator gathers case documentation (SDS, photos, field notebook entries, NOVs) and files affidavit for civil charges in municipal court.
- Notify County District Attorney, if investigation reveals potential criminal intent.
- Notify TCEQ for enforcement and/or possible funding if Responsible Party refuses or is financially-unable to perform remediation.
- Conduct legal enforcement seeking Responsible Party remediation (see *Cleanup, storage, disposal by responsible party or RP contractor*).

REMEDIATION, WASTE STORAGE AND DISPOSAL BY RESPONSIBLE PARTY OR RP CONTRACTOR

- If necessary, Responsible Party (or contractor hired by Responsible Party) conducts remediation.
- SCRP Investigator makes recommendations on remediation methods, sample parameters, waste storage and disposal methods, etc.

INVESTIGATION / REPORT COMPLETION

- Inspect Site to verify remediation of observable contamination.
- Review lab analyses, waste manifests and other remediation documentation.
- Complete and document follow-up investigations, as necessary.
- Enter report into database.

Austin Fire Department Special Operations Division

Introduction

The AFD Hazardous Materials Response Team was reorganized in 2002 and was combined with other specialty teams within AFD. The Hazardous Materials Team is now referred to as the Special Operations Division. The Special Operations Division supplies hazardous material response personnel, apparatus and equipment from four fire stations located in the central, north, east and south sectors of Austin. This Division also supplies Special Operations personnel who act as incident advisors, provide training, evaluate new equipment and maintain specialized response equipment.

Program Activities Description

Generally, this program targets the control of potentially hazardous material spills or other incidents that may endanger human health and safety within the City limits. The AFD emergency response activities are not targeted to any specific industry or business, rather the Special Operations Division is trained to handle a wide variety of hazardous materials incidents including liquid spills, gas releases and rescues under hazardous conditions.

In addition to providing personnel, training and equipment for emergency response, the AFD maintains a large inventory of equipment for use during hazardous materials incidents, including spill containment, chemical monitoring, personnel protective clothing, confined space entry, decontamination and water rescue equipment.

Incidents are responded to in an expeditious manner with a priority given to life safety and protection of property. Fire suppression may not be initiated due to possible run-off of toxic substances. The "no attack" strategy has become an important consideration during the incident pre-planning effort.
Once an immediate hazard has been alleviated, the Special Operations Division has required follow-up remediation when a responsible party is identified, or actually performs cleanup operations.

The AFD Special Operations Division coordinates with the City of Austin WPD, TCEQ, and the HHSD to ensure that current environmental and life safety regulations are met. The Special Operations Division will continue to provide emergency response capabilities as described throughout the permit period.
The City does not anticipate any further changes to the Spill Response Program, however changes to the scope of the program components may be considered during review of the City’s annual operating budget.

4. Pollution Prevention/Good Housekeeping for Municipal Operations

Introduction

In the effort to reduce the amount of pollutants discharged into local waterways from municipal operations, the City of Austin has developed and implemented several programs. Many of these programs are also described in detail throughout various sections in the SWMP.

Program Activities Description

A. Pollution Prevention and Reduction/Good Housekeeping Programs

The Pollution Prevention and Reduction for Municipal Operations programs are implemented by several departments as described in the Storm Water Management Plan (SWMP). The WPD screens a list of all City properties and facilities for the purpose of identifying those operations with potential municipal sources of stormwater pollution. Site visits to those identified city facilities are then conducted on a rotational basis.. Some examples of City facilities and properties included in this program are fleet service stations, power plants, fire stations, municipal pools, golf courses, airport operations, the household hazardous waste facility, and material storage areas.

Inspections include confirmation of proper waste storage, handling and disposal practices; plumbing connections to the storm sewer system; and review of housekeeping and facility maintenance practices. In addition, staff initiates training to periodically advise City personnel on stormwater best management practices (BMPs). City staff also determines which of these facilities require coverage under the Texas Pollution Discharge Elimination System (TPDES). Facilities that are subject to TPDES permit requirements receive a more detailed inspection that includes a thorough review of the facility's Stormwater Pollution Prevention Plan (SWP3), including the description of potential pollutants and their sources and required documentation. Staff monitors the facility's active implementation of the SWP3 to verify that the plan is current and site specific.

Spill and Complaints Response Program (SCRP) staff responds to emergency spill incidents and investigates pollution complaints involving City properties. Calls are typically reported to the City's 24-Hour Pollution Hotline and response is rapid to prevent and/or minimize potentially polluting discharges to the storm sewer system. Staff identifies illicit discharges and requests that corrective actions and preventive measures be taken. Again, SCRP staff provides training on best management practices and other environmental regulatory requirements. Follow up visits are conducted to ensure compliance.

The ARR Litter Abatement Program targets City owned property within the City limits, including parks, for removal of trash, litter and debris which has collected in the parks, streets and the public rights-of way. The ARR Street Cleaning Program targets the cleaning of curbed City streets within the City limits for removal of trash, litter and dirt streets and gutters, for health, safety, aesthetic and water quality reasons. ARR also provides convenient recycling services for municipal facilities, through the workplace recycling program known as "Office Stream" Recycle, Reduce, Reuse, Rethink.

The City of Austin supports Keep Austin Beautiful (KAB) which targets business and citizens in the City of Austin, through activities that center on litter abatement, recycling, environmental education, and beautification in Austin. WPD, Scoop the Poop Program, partners with the Parks and Recreation Department. Pet Waste dispensers are located in over half the City's parks and facilities to encourage dog owners to clean up after their pets. The City of Austin's education and awareness programs are conducted by the WPD, ARR, AW, and Austin Energy (AE). Training for internal customers, (employees), is used to maximize participation in water quality, waste reduction, and water and energy conservation programs. Safety training is mandatory for City employees and provided quarterly on a variety of subjects including BMP's for municipal operations.

B. Waste Handling

The City of Austin properly disposes of waste that is removed from the MS4, and other municipal operations, including maintenance of storm water structural controls. For example WPD, FOD crews when removing trapped floating materials from its two locations on Lady Bird Lake, load the materials into City dump trucks and haul the material to an acceptable local landfill. The materials removed from the maintenance of City of Austin storm water structural controls are taken to a local approved landfill. FOD vactor trucks remove materials from the City of Austin storm sewer pipes and drains. The materials are taken to a Field Operations maintenance facility with dewatering areas, and solids are taken to an approved local landfill. PWD takes all the litter and debris picked up from streets to an approved landfill.

C. Pesticide, Herbicide, and Fertilizer Application

Integrated Pest Management Program Activities Description

In order to satisfy the MS4 storm water permit requirement to implement controls to reduce the discharge of pollutants related to the storage and application of pesticide, herbicide and fertilizers, the City of Austin uses the activities of the City's Integrated Pest Management (IPM) Program.

The IPM Program, managed by the WPD, will be responsible for the following activities over the course of the permit term:

- Implementation of an IPM public education campaign;
- Providing guidance to City of Austin departments and programs in pest management issues;
- Review IPM plans when they are required in the land development review process;
- Providing technical assistance on IPM practices for negotiated development agreements between the City and other entities;
- Ensuring compliance of the Save Our Springs (SOS) water quality ordinance via review of IPM plans required for development projects in the Barton Springs Zone;

- Coordination of compliance with the TPDES Pesticides General Permit TXG870000;
- Maintain pesticide application and pesticide applicator license records for some city departments that use pesticides.

The activities listed above would target audiences such as:

- Homeowners and the general public in the Austin area
- Professional communities including those who design, and manage outdoor areas
- Retail distributors of pest control products and gardening supplies
- City of Austin contractors responsible for pest management and area maintenance

Conduct an IPM Public Education Campaign

The primary focus of the City's IPM public education program is to provide information related to IPM principles and practices and non-point source pollution that may result from improper fertilizing and pest management practices. Program staff also provides information related to specific yard and garden products, general water quality, xeriscaping, erosion control practices, rain gardens, and wet pond maintenance. Information is disseminated through various means including the Grow Green/IPM websites (www.GrowGreen.org) and (www.austintexas.gov/ipm) social media, public service announcements, and printed media. Printed material include posters, bookmarks and brochures distributed in displays at local gardening centers, City libraries, and facilities, at fairs, festivals, trades shows on billboards; via one-on-one conversations; and presentations to community and professional volunteer and non-profit organizations.

Administration of an Internal City of Austin IPM Program

The focus of the internal City of Austin IPM program is to provide guidance to City of Austin departments who are responsible for application of pesticides, herbicides, or fertilizers on City-owned or managed land by staff or contractors;

- When requested by city staff, the IPM Coordinator conducts on-site visits, consults, researches, advises diagnosis and treatment methods when unique IPM situations arise.

- IPM Program staff coordinates compliance with the TPDES General Pesticide Discharge Permit TXG870000.

Administration of an IPM Program for Private Development Projects

City of Austin codes and criteria require certain development projects to prepare and submit an IPM plan for the proposed development. IPM plans for water quality protection are required when one or more of the following conditions exist;

- If development is to occur within identified environmentally sensitive areas within the City's planning jurisdiction.
- On intensive landscape management sites such as athletic fields and golf courses;
- When required by a negotiated agreement, such as a Planned Unit Development;
- To qualify for Green Building certification credits;
- When certain storm water control measures are utilized to meet development requirements; these measures can include; Wet Ponds, Retention/irrigation systems, Vegetated filter strips, Biofiltration systems, Rainwater harvesting and Rain gardens.

The IPM program staff review proposed private IPM plans for the minimum pollution prevention and source control measures outlined in the City of Austin Environmental Criteria Manual and provide approval. IPM program components required by the Environmental Criteria Manual include:

- Lists of any pests (insects, mammals, plant disease, weeds, etc.) anticipated to require control
- For each pest, a hierarchy of treatments must be developed beginning with cultural, mechanical, biological and other non-toxic controls and ending with chemical control.
- A description of the monitoring plan, damage level or other method to be used to determine when treatments are necessary
- A list of control products included in the hierarchies, identified by active ingredients and toxicity class, if necessary
- A description of the project for which the plan has been developed (commercial, residential, etc.), including approximate acreage of each landscape type(s) (i.e., turf, ornamental, etc.)

- If the project is being developed under the Save Our Springs (SOS) Ordinance, a drawing that identifies any watercourse, creek, spring, pond, storm sewer inlet, sinkhole, cave or fault within 150 feet of the area to be maintained. Additionally, no pesticide and fertilizer may be applied within 100 feet of these features or within the setback of any Critical Environmental Feature, as defined by the City of Austin Land Development Code.

The IPM plans are considered dynamic documents that may be amended to eliminate measures proven to be ineffective, add additional measures, amend pest control hierarchies or address pest problems that may arise after the original IPM plan submittal. Program staff also provide technical guidance to development applicants as needed.

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D. List of Municipal Facilities

See appendix

5. Industrial and High Risk Program

Industrial and High Risk Inspection Program

Introduction

The goal of the City's Industrial and High Risk Runoff Program is to identify and control pollutants in storm water discharges to the municipal separate storm sewer system (MS4). This goal will be achieved through the establishment of priorities and procedures for inspections and monitoring of the industrial facilities identified in § 122.26 (d) (2) (IV) (C) of the NPDES regulations.

Program Activities Description

The Industrial and High Risk Program will be based on the activities of the AFD Aboveground Hazardous Material Permit Program and the WPD programs related to the inspection of municipal landfills and industrial facilities the City may determine as potentially contributing a substantial pollutant load to the municipal storm sewer system.

Hazardous waste treatment, disposal or recovery facilities and facilities subject to SARA Title III: The permitting of hazardous material locations in Austin began in 1985 with City Council approval of the Hazardous Materials Ordinance. Since that time the AFD Aboveground Hazardous Materials Permit Program has been permitting and conducting inspections of facilities that store or handle hazardous materials. As defined in the International Fire Code (IFC) and Local Amendments, industries and commercial facilities storing hazardous materials that meet the following requirements are required to obtain an Aboveground Hazardous Materials Storage Permit:

- The Hazardous Material has a health, flammability, or instability rating of 2 or more as defined in the National Fire Protection Association (NFPA) Standard 704.
- The Hazardous Material is stored or used aboveground in quantities exceeding the amounts specified in the Local Amendments to the IFC.
- The Hazardous Material is a compressed or liquefied compressed gas in a quantity exceeding 100 cu. Ft at NTP.

The Aboveground Hazardous Materials Permit Program has identified approximately 2,486 facilities in the Austin city limits that meet the above noted criteria.
These facilities are issued Aboveground Hazardous Materials Storage Permits that are renewed every three years. These locations are subject to periodic, routine inspections to ensure proper storage, handling and disposal practices. Of the total number of facilities included in the Aboveground Hazardous Materials Storage Permit Program, there are approximately 376 above ground storage/use facilities that are considered Texas Tier Two facilities. None of these facilities are known to be federally permitted hazardous waste treatment, storage or disposal facilities. The Tier Two facilities are subject to the federal (EPCRA Title III) and state "Community Right to Know" reporting requirements and as such, provide the AFD with all the reports required by the regulations.

The AFD currently inspects the Tier Two facilities on an as needed basis, usually in response to new construction permit approvals, or as a result of citizen complaints. During inspections, AFD reviews the facility's hazardous material storage, handling and disposal practices and enforces City and IFC requirements. Many of the Fire Code requirements that are enforced have the potential to impact storm water discharges at the facility.

These requirements include, but are not limited to

- proper storage of raw and finished materials
- proper spill control, drainage control and secondary containment
- prohibitions on unauthorized discharges
- proper procedures for outdoor storage, dispensing and use of materials
- leak detection, leak reporting and emergency shut-off equipment maintenance

If during facility inspections or reviews AFD observes practices or procedures that may affect storm water discharge quality but are not violations of the IFC, the City's Pollution Hotline will be notified and an inspection by WPD will be initiated. In addition to coordinating efforts with the WPD, AFD also coordinates its permitting

activities with the TCEQ, and the HHSD. Coordination with these agencies should result in the identification of additional facilities that have not obtained an AFD Aboveground Hazardous Materials Permit.

Municipal Landfills: The City of Austin currently has no active landfill locations. As such, the City has implemented a program to investigate inactive landfills that is directed primarily by WPD, with assistance from the AW, and the ARR.

The goals of the Inactive Municipal Landfill Investigation Program include enforcing code provisions, preventing polluting discharges to waterways, eliminating nuisance conditions and preventing hazardous public health conditions. These goals are accomplished by:

- locating and identifying older closed and abandoned landfills in the City of Austin
- performing periodic visual inspections of each site as necessary
- collecting and analyzing leachate from selected sites as necessary
- prioritizing potential problem sites for future investigations and land use planning
- plotting all locations on base maps and digitizing locations into a geographic information system
- providing information to City staff and interested citizens
- using centralized files for landfill information; and
- responding to citizen-generated complaints, requests for information from the general public, and information requests by private firms conducting environmental audits.

Forty-six former landfills have been inspected in the Austin area. Additional sites have also been identified that appear to contain only buried construction debris. Efforts to investigate former landfill sites will continue to be coordinated with the TCEQ, HHSD, AFD, and Travis County environmental staff as appropriate.

Investigations of specific sites will also be conducted based on complaints or evidence of a particular pollution problem. When investigated, sites are examined for access, proximity to waterways, presence of exposed waste, odors, landfill gas generation, land subsidence, erosion or cracking of waste cover, water ponding,

vegetative stress, leachate discharge, conditions of adjacent waterways and presence of structures or buried utility lines. Surface water, groundwater or leachate samples may be collected to determine public health threats or environmental hazards. Photographs may also be taken to document site conditions and demonstrate changes that occur over time.

During the five year permit period, WPD staff will provide visual inspections:

- periodically at the inactive municipal sites
- at initiation of remediation activities at selected sites and
- upon receipt of complaints or reports of pollution problems

Industrial facilities that the municipality determines may contribute a substantial pollutant load to the municipal storm sewer system: In the effort to identify facilities that may be contributing a substantial pollutant load to the City's municipal storm sewer system (MS4), the WPD Storm Sewer Discharge Permit Program (SDPP) has implemented a database of industrial and high-risk facilities discharging to the City's MS4 within the Austin city limits. The SDPP staff will continue to utilize the TCEQ NOI database and information gathered during field inspections by the AFD and other City departments to populate and maintain information in the database. In addition, the SDPP will send out periodic surveys to:

- industrial facilities the City has identified as high-risk based on the criteria listed in §122.26 (d)(2)(iv)(C) of the NPDES regulations; and
- facilities required to obtain TPDES industrial storm water permit coverage.

The survey includes specific questions related to the facilities operations, maintenance practices and activities that may contribute pollutants to storm water discharges. The survey also requests that the facility certify that one of the three following scenarios is accurate:

- The facility is not an industrial facility required to obtain TPDES Storm Water Permit coverage;
- The facility currently has a TPDES Storm Water Permit; or
- The facility is eligible to use the "No Exposure" exclusion for TPDES Storm Water Permit coverage.

If the facility has obtained a TPDES Storm Water Permit, the SDPP requests that the operator submit a letter certifying that a Storm Water Pollution Prevention Plan (SWP3) has been developed and is available for viewing by inspectors. The SDPP also requires that the operator submit a copy of any monitoring results for the facility (if monitoring is required). SDPP staff will review the monitoring results submitted by each facility, and if the results are questionable, SDPP staff may conduct a facility inspection. SDPP may also conduct a facility inspection if questionable structures or activities are identified during inspections by other City departments. When a facility is identified as requiring a TPDES storm water permit but does not currently possess proper permit coverage, SDPP staff will inform facility representatives of the TPDES regulations and their responsibilities to obtain permit coverage. If the facility does not obtain proper permit coverage or is violating provisions of a storm water permit, SDPP staff will report the facility to the appropriate permitting agency, in most cases the TCEQ, for possible enforcement action.

Over the five year permit period the City will continue the industrial and high-risk inspection activities as described, focusing primarily on:

- Tier II facilities in the AFD Aboveground Hazardous Materials Permit Program,
- Inactive landfills, and
- Facilities identified as posing the greatest threat to discharge pollutants to the City’s MS4 through the City's survey and inspection efforts.

The SDPP will continue efforts to identify permit and inspect facilities located within both the Barton Springs Zone (BSZ) and the Full Purpose City limits that conduct activities with a high potential for illicit discharges of pollutants. Staff targets facilities with activities such as motor rebuilding and repair, machine shop services, transmission rebuilding and repair, radiator repair, fuel storage and dispensing facilities. During inspections of facilities, SDPP staff will confirm proper waste storage, handling and disposal practices, inspect plumbing connections to the storm sewer system and review housekeeping and facility maintenance practices.

SDPP staff may also recommend best management practices that are appropriate for the facility during facility inspections.

Underground Storage Tank

The Underground Storage Tank (UST) Leak Detection Program continues to focus efforts on all permittable facilities with underground storage tanks found within both the Barton Springs Zone (BSZ) and the Full Purpose City limits. The UST Program staff conducts inspections of identified facilities, and construction of new facilities ensuring compliance with City Water Quality Codes, including proper storage, monitoring and leak detection activities. UST Program staff recommends best management practices and provides educational materials applicable to each operation as needed, during permit review and renewals. The UST Program will issue UST storage and/or construction permits to facilities in the targeted BSZ area.

Monitoring

Most of the EPCRA Title III facilities found in the Austin area are included in one of the industrial activity SIC codes or in one of the narrative industrial activity descriptions that require storm water permit coverage. As such, the City of Austin will not conduct any storm water discharge monitoring at facilities where the terms of the TPDES storm water permit are considered by the City to be sufficient, and if the review of the monitoring results (based on monitoring conducted by the facility) are in compliance. If the SDPP staff determines that the monitoring results submitted to the City by the facility are not in compliance, a letter will be sent to the facility requesting compliance. If repeated non-compliance occurs, the program will notify the appropriate permitting agency, TCEQ, for possible enforcement action. If it is determined that a facility included in either the AFD or SDPP high-risk inspection program does not meet the eligibility requirements for TPDES storm water permit coverage, a self-monitoring and reporting program may be established for the facility. The City does not anticipate any changes to the Industrial and High Risk Program.

6. Construction Site Storm Water Runoff

A. Site Development Plan Regulations

As noted in the Areas of New Development and Significant Redevelopment section two of the Storm Water Management Program, the City of Austin requires the approval of a site plan and release of a site development permit for multifamily or commercial development on a specific parcel of land. For a detailed description of responsibilities and procedures related to the site development plan regulations, please refer to the Areas of New Development and Significant Redevelopment Section 2 of the SWMP.

B. Construction Waste

DSD Environmental Inspectors inspect all projects which have site development plans during construction for compliance with BMPs and with the erosion and sedimentation control plan and the water quality/detention plan. The erosion and sedimentation control plan shows appropriate areas for staging, construction waste, spoils, concrete washout, dumpsters for litter and sanitary waste from porta-toilets. The pre-construction meeting handout includes a page stating “all spoils, fill, and waste from the construction site is required to go to an approved land fill.” The inspector can request trip tickets from construction site managers to verify where the construction waste and spoils have been taken.

C. Inspection of Sites during Construction

Introduction

The Environmental Inspection Section of the DSD is responsible for ensuring field enforcement of City water quality regulations, as found in the specific conditions of approved development permits. DSD Environmental Inspectors take the lead role for environmental field inspection of all projects issued site development permits, and for enforcement on projects that become non-compliant. The DSD Site Subdivision Inspectors take the lead role on environmental field inspections on subdivision

construction projects. The Construction Inspection (CIP) Section of Public Works has the lead authority for inspection of CIP Projects, including environmental site inspections. DSD Site Subdivision Inspectors monitor compliance with approved erosion and sedimentation control plans ESC on subdivision construction plans. PWD Construction Inspectors monitor ESC's on CIP projects. DSD Environmental Inspectors provide assistance on monitoring and take the lead on enforcement actions relating to site construction sequencing of water quality and drainage structures, and maintenance of erosion and sedimentation control (ESC) plans. The purpose of this program is to inspect development projects to ensure compliance with requirements of valid development permits and approved (ESC) plans; and to ensure proper construction of on-site drainage facilities and water quality controls during the construction process.

Currently, all construction and development projects involving land-disturbing activities within the City and ETJ are required to use erosion and sedimentation controls in accordance with technical guidelines found in the City's Environmental Criteria Manual (ECM), and Drainage Criteria Manual (DCM).

Program Activities Description

At the commencement of development or construction activity, the project site engineer/manager is required to contact the supervisor of the DSD Environmental Inspection, and/or PWD Construction Inspection Section. A pre-construction meeting is conducted at project inception, to verify installation of the ESC's and BMP's per the approved plan, and followed by regular site inspections.

If during site inspections the inspector finds the applicable ESC plans to be inadequate at a given site, minor modifications to the approved ESC plan and construction sequencing plan may be made in the field to upgrade erosion controls without written DSD approval. Major modifications may require a plan correction. At the final inspection, the appropriate inspector confirms the proper completion of runoff and water quality controls, permanent ESC controls and site restoration as a prerequisite to project acceptance or issuance of a certificate of occupancy.

If a development project is found in non-compliance with conditions of the development permit during a site visit, an inspector may give the project manager a verbal warning with instructions to achieve compliance within 24 to 48 hours. This action is followed by a written warning if remedial action was not taken to resolve the problems. If corrective actions to bring about compliance are not achieved, a cease-and-desist order may be issued, whereby all work at the project site is stopped until compliance is achieved. A "red-tag" is posted at the site, and a written notice of the cease-and-desist order is mailed to the alleged violator with an explanation of the site factors resulting in non-compliance. If a development project is found to be without a valid development permit and in non-compliance with applicable water quality regulations, or a high priority violation exists, a cease-and-desist order may be issued immediately.

In addition, DSD will continue to dedicate environmental inspectors to the Barton Springs Zone (BSZ) to ensure development projects comply with applicable erosion control standards. This program coordinates with and assists inspectors from other governmental entities in controlling erosion from active construction sites. Such inspection coordination most commonly occurs with Travis County and the TCEQ. Citizens in the Austin area call Environmental Inspection with complaints and requests for inspections, on sites that appear to not be in compliance with the site development permit or might not have a site development permit. Environmental Inspection investigates these complaints, or requests for inspection, and documents the investigation and reports the findings to the concerned citizen.

D. Public Education for Construction Site Operators

Introduction

In the effort to reduce the amount of pollutants discharged into local waterways from construction related activities, the City of Austin has developed and implemented a

variety of public information and education tools for construction site operators and the development community.

Program Activities Description

The City provides educational information related to storm water management techniques such as erosion and sedimentation controls, construction sequencing, permanent water quality controls and site restoration activities. Information has also been developed related to construction site pollution prevention activities and "green building." The City provides this information to developers and construction site operators in the following ways:

- Written materials
- One-on-one meetings
- Training and seminars

Written Materials

The City has found that written materials are an effective tool in communicating regulatory guidelines, technical guidance and basic non-technical information to both the development and construction communities. The WPD and DSD have developed many of these documents that range from fact sheets on good housekeeping practices for construction sites to detailed criteria for the design and implementation of various storm water control structures.

One-on-One Meetings

The City's Development Assistance Center (DAC) provides the first one-on-one interaction with the development community. During the initial discussions, City staff provides general information and guidance to the development proponents related to the various permit applications, certification and regulatory requirements that may be associated with their particular type of development project. The DAC has environmental, water quality & drainage staff to assist with issues owners, engineers, contractors, consultants, and citizens may encounter.

During the project review and approval process, DSD staff members assigned to projects continually coordinate with the project proponents to resolve many of the details related to the site specific environmental needs, including the particular erosion control and sedimentation requirements. Environmental Inspectors work with on-site operators during routine site inspections to achieve compliance.

Training and Seminars

The City has developed and implemented several training courses that provide storm water management and pollution prevention information to the development and construction communities.

The following are the types of training tools utilized:

- Topic Specific Presentations
- Technical Seminars & Workshops
- Conferences & Trade Shows

Many of the training tools have been crafted for the development and construction communities, but City staff is also encouraged to participate and generally take advantage of the training opportunities. A variety of other workshops have been developed specifically for the City's construction project management and inspection staff in to relate regulatory requirements and provide superior inspection services to new and redevelopment projects.

The City does not anticipate any changes to the Construction Site Runoff Program. However changes to the scope of the program components may be considered during review of the City's annual operating budget.

7. Public Education and Involvement

A. Public Education

1. Water Quality Education and Awareness Programs

Introduction

The City of Austin's public education and awareness programs are conducted by the WPD, and ARR. Advertising, education, both internal and external, and outreach activities are used to maximize participation in water quality, waste reduction and conservation programs. The target audience for educational programs includes homeowners, students, businesses and professionals.

The Policy and Planning Division of the WPD has primary responsibility for the management of the water quality component of these programs. ARR is responsible for the trash abatement, hazardous chemical and recycling components. When possible, these departments have formed partnerships to increase their ability to reach a larger audience with a wider, yet compatible, message.

Program Activities Description

The public education and awareness efforts of the City of Austin encompass a number of different elements reflecting the wide variety of water quality-related programs that are supported by the City. Specific elements, which will likely continue through the permit period include the following:

- ***Grow Green*** – This interdepartmental homeowner and landscape professional outreach program provides Earth-Wise gardening tips in nearly all of the nurseries and the big box retail in Travis County. The Watershed Education group coordinates this effort to provide "one-stop shopping" for citizens for all their gardening needs. Six City departments participate and address water quality, water conservation, composting Dillo Dirt, The Don't Bag It Program among other issues. The effort helps prevent duplication of effort and provide cost savings. Display units contain a wide variety of fact sheets to help homeowners make informed decisions on least toxic alternatives for their yard care at the point of purchase for pesticides and fertilizers. A full-color Native and Adapted Plant Guide is also available to encourage the use of plants that require fewer pesticides and less water, and is available as an online searchable database. Grow Green offers classes for homeowner's and a Landscape Professional Training series.

- ***Integrated Pest Management*** – The City's IPM program produces brochures, posters and a web page (under the auspices of the Grow Green program) containing information on least toxic pest management techniques. Presentations and public appearances on TV and radio also supplement the public outreach activities of this program. Grow Green includes television spots that ask homeowners to avoid inappropriate use of pesticides in the spring gardening season. Assistance to City of Austin staff and the general public is offered via a telephone assistance line.
- ***Earth Camp*** - The camp is offered to fifth grade students in the lower socio-economic areas of Austin and focuses on watershed and aquifer education. Earth Camp provides teacher training, curriculum and materials for classroom lessons, as well as field trips, outdoor activities and environmental expertise, all of which are provided free of charge. Components include water quality testing, lessons on macro-invertebrates, green gardening, cave tours and visits to Splash! Into the Edwards Aquifer, a hands-on, interactive educational exhibit. A teacher-led version of Earth Camp allows teachers who have attended regular Earth Camp to come back, and lead the following year. The City supports this program with full time and temporary staff, training, equipment, and bus funding.
- ***Earth School*** - This one-hour, in-school lesson provides hands-on watershed and aquifer education to Austin Independent School District (AISD) and Eanes Independent School district (EISD) fifth graders. Using models developed by WPD and other educational sources, students learn how storm water carries pollutants to creeks and aquifers. Earth Camp, teacher Led Earth Camp, or Earth School are offered to 100% of AISD elementary schools.
- ***Watershed Detectives*** – The middle school curriculum involves students in a hands-on simulation of an investigation of a real live fish – kill. Students use topographic maps and a watershed model to determine flow paths and then locate the source of contamination by conducting simulated tests.
- ***Hydrofiles*** - This program teaches high school students how to monitor water quality in our creeks. Classes are also given the opportunity to go on field trips to local creeks or caves.
- ***Storm Drain Marking*** - Volunteers are recruited to affix tile markers to storm drains, informing citizens, "*No Dumping, Drains to Creek"*. The tiles are available in both English and Spanish.
- ***Scoop the Poop****:* In partnership with the Parks and Recreation Department, pet waste bag dispensers have been placed in City parks to encourage dog owners to clean up after their pets. The program also partners with dog focused non-profits to raise awareness about the importance of picking up pet waste by distributing branded giveaways and including educational articles in newsletters and social media.

- ***East Austin Environmental Initiative (EAEI)*** - The WPD publishes the *Eastside Environmental News*, a biannual newsletter that has hard copies and electronic versions which focus on environmental issues and City activities affecting east Austin communities. Staff may participate in community events such as neighborhood cleanups, meetings, and special events.
- ***Austin Enviro Mechanics*** – This program is a cooperative effort between WPD and local businesses. The program encourages businesses to adopt shop practices that keep pollutants from entering storm drains and waterways. Those who participate are given rewards that benefit both the shop operators and their customers.
- ***Shade Tree Mechanic*** – This program is targeted at do it yourself citizens who like to take care of vehicles. Citizens are allowed to pick up a free oil change bucket, sun shade and educational materials by providing proof of residency at the WPD office, or Household Waste Facility. Home site inspections are performed if there is a violation reported to the 24-hr pollution hotline, or by citizen request.

Some additional programs currently created for the education programs are:

Printed Material - Watershed and Aquifer Education:

Brochures, posters, and signage are produced as new needs are defined.

Media: As funding allows, the City will run advertisements and radio spots in the local media to promote water quality education.

As noted in the introduction, City departments have formed partnerships to increase their ability to reach a larger audience. The City of Austin also coordinates its various public education and awareness efforts with other governmental entities. Partners have included Austin Independent School District, Lower Colorado River Authority, Keep Austin Beautiful, Texas Parks and Wildlife Department and The Barton Springs/Edwards Aquifer Conservation District the Friends of the Colorado River, Children in Nature Collaborative of Austin, and other groups.

B. Public Involvement and Participation

1. Keep Austin Beautiful Program

Introduction

Keep Austin Beautiful (KAB) Program is a 501(c) (3) non-profit organization, officially certified affiliate of Keep America Beautiful. KAB's core purpose is to inspire and educate individuals and our community towards greater environmental stewardship. The organization operates with the support of the City of Austin, Travis County, local businesses, community groups and citizens. Extensive coordination occurs between the KAB program staff and the staff of City and County programs that benefit from KAB's public education and awareness efforts in the areas of water quality, non-point source pollution, littering, recycling and beautification. Continuing support of this program is provided yearly by the City of Austin and Travis County through funding approval during budget cycles. Responsibility for the operations of the program rest with the KAB staff and policy and oversight is the responsibility of a volunteer board of directors. The programs of KAB target all business and citizens in the greater Austin area through activities, that center on litter abatement, recycling, environmental education and beautification. The primary goal of KAB is to clean, beautify and protect the Austin environment through physical improvements and hands-on education:

- ***Clean*** - Removing litter from our neighborhoods, streets, schools, parks and public spaces, and promoting a litter-free Austin.
- ***Beautify*** - Empowering and supporting schools, neighborhood groups and local businesses in efforts to beautify their communities and restore habitats.
- ***Educate*** - Promoting environmental stewardship through presentations, hands-on activities and service-learning projects.
- ***Recognize*** – honoring the most outstanding environmental efforts of individuals, schools, and organizations.

Effectiveness of the Keep Austin Beautiful Program has been measured utilizing a number of parameters including:

- estimated litter reduction
- the number of river and creek clean-up events sponsored each year
- the number of student and teachers reached through the education program
- the number of promotional materials distributed
- the number of volunteers engaged in service projects
- the number of volunteer hours donated to the community

Program Activities Description

The KAB board and staff develop and implement projects and programs in the areas of cleanup, beautification, habitat and creek restoration, and education. Major activities sponsored or supported through the efforts of KAB in past years have included the following:

- Environmental Education - Providing environmental presentations and activities to students K-12.
- Awards - Recognizing positive behavior in all segments of the community

  Clean Sweep - Providing opportunities for grassroots involvement in city-wide clean-ups
- Community Cleanups - Providing opportunities for grassroots involvement in cleanups year-round
- Adopt a Creek - providing the community with an opportunity to take ownership of local creeks and help keep them clean.

KAB anticipates these activities will continue over the five year permit period. In addition KAB will continue to coordinate its program with public agencies with the same or similar environmental focus. These include the City of Austin, Travis County, Keep America Beautiful, Keep Texas Beautiful, LCRA, TCEQ, Texas General Land Office, AISD and the University of Texas at Austin, Austin Community College, Capital Area Council of Governments and Texas Department of Transportation.

2. Pollution Hotline Public Education

Introduction

In the effort to protect water quality, the City of Austin established a 24-Hour Pollution Hotline for citizens to report pollution concerns in 1986. The City has promoted the Pollution Hotline in a variety of ways over the years and the WPD Spills and Complaint Response Program (SCRP) staff now investigates approximately 1,400 pollution complaints each year, the majority of which are citizen pollution complaints received through the Pollution Hotline. The increase in calls to the Pollution Hotline over the years is believed to be in large part due to the increase in public awareness about the reporting system and not just an increase in the number of incidents occurring in the Austin area.

Program Activities Description

The Pollution Hotline is a system that allows the general public to report pollution 24 hours a day, seven days a week. The hotline is answered by a WPD staff member during normal business hours and by an automated voice mail and paging system after hours. The SCRP staff investigates the complaints received on the hotline, identifying the pollutants, the potential pollutant sources and the party responsible for the illicit discharge. All complaints received on the Pollution Hotline are treated as anonymous complaints and the WPD makes every effort attempt to keep complainants' names confidential. The SCRP staff believes citizens are more inclined to use the public reporting system if there is an attempt to restrict access to their names. The WPD promotes public reporting of illicit discharges and improper disposal activities on the hotline in a variety of ways, with some of the Pollution Hotline promotional materials published in both Spanish and English. The following is a list of promotional materials and activities the City uses:

- Newsletters, fact sheets and specific promotional materials such as brochures and magnets are provided to the public at trade shows, libraries, community centers, community events and a variety of speaking engagements
- The WPD web site provides information on the Pollution Hotline, the SCRP activities and common pollutants and potential sources

- Radio announcements, newspaper advertisements and periodic press releases to the media are used to publicize the hotline, the SCRP and specific pollution prevention initiatives
- Magnets, brochures and door hangers promoting the Pollution Hotline, the SCRP and specific pollution prevention practices are provided to citizens by SCRP staff during complaint investigations
- Other City Department staff provides Pollution Hotline magnets and materials to the public at their offices and during field inspections

The WPD and the SCRP will continue to promote the Pollution Hotline and facilitate public reporting of illicit discharges and improper disposal activities in the Austin area during the five year permit period.

3. Austin Resource Recovery Public Education

Introduction

The ARR implements education programs that reduce the generation of litter and promote proper disposal of household hazardous waste.

Program Activities Description

Pay-As-You-Throw Educational Support

Pay-As-You-Throw (PAYT) is a garbage collection system that aggressively encourages recycling and “smart” trash habits. The PAYT program reaches residential and commercial customers through billboards, print ads, utility bill inserts and the City's web site.

Curbside Single Stream Recycling Educational Support

The Curbside Single Stream Recycling Program provides weekly collection of newspaper, corrugated cardboard, glass bottles and jars, and tin and aluminum cans and many plastic bottles to all households served by City garbage collection. The program includes the Block Leader Program and Recycling Pays projects to promote public awareness and participation in the program.

The Recycling Program reaches the various audiences through brochures, magnets, billboards, radio ads, public service announcements, print ads, seasonal event fliers,

compost kitchen buckets made from recycled materials, rulers and pencils made from 50% post-consumer material.

Household Hazardous Waste Collection Facility Education

The City of Austin operates a permanent facility to collect hazardous home chemicals from Austin and Travis County residences a throughout the week in the effort to direct the citizenry to properly dispose of waste and prevent disposal in the landfill or dumping on the ground where chemicals can cause pollution. A key to the HHW Program's long-term success is effective public education on aspects of waste reduction, pollution prevention and consumer behavior.

The program's educational mission is to encourage the use and purchase of non-toxic or less-toxic alternative products, wise consumer practices, and to avoid purchase or acquisition of materials and products that may not be used. One of the program goals is for individual residents or participants to need HHW programs less often and for less material in the future. Information is provided over the telephone, webpages, to ARR/AW customers through utility bills, fliers, newspaper advertising, presentations to area schools, professional organizations, and environmental conferences, and outreach at the facility during collection activities. Public education and information efforts will be reviewed each year.

4. Barton Spring Zone Specific Education

Over the five year permit period the WPD will continue the following activities:

- Maintain the educational signage at Barton Springs Pool that explains how the Edwards Aquifer functions and provides information on the Barton Springs Salamander, and Austin Blind Salamander endangered species that reside in the Barton Springs.
- Maintain two education stations at the Splash! Groundwater education exhibit.
- Coordinate storm drain marking activities in portions of the Barton Springs Zone watersheds within the permit area.

The City does not anticipate any changes to the Public Education Program. However changes to the scope of the program components may be considered during review of the City's annual operating budget.

8. Monitoring Programs

A. Dry Weather Screening

Introduction

The general topography of the City of Austin is characterized by a large number of natural creeks and tributaries that serve as the primary conveyance of storm water through the City. For this reason, the typical storm sewer pipe system is short in length and serves to carry storm water runoff from a limited drainage area to the nearest waterway. The result is a municipal separate storm sewer system (MS4) that is comprised of numerous small pipe networks and many outfalls. In past dry weather screening activities, relatively few outfalls were found to have dry weather flow.

Program Activities Description

The goal of the dry weather screening program will again be to screen a proportionate number of storm water outfalls within the City of Austin MS4 during the five year permit term, focusing screening efforts in several watersheds each year, and using a ratio of outfalls screened to total number of outfalls to calculate and report the percent of MS4 in which outfall evaluations have been completed. Storm water outfalls with a diameter of 36 inches or larger identified and located during the first permit term and additional outfalls identified for inclusion in the screening program will be screened, based on visual observation of flow during field investigation activities.

Program Procedures

During dry weather periods (no rainfall in the previous three days), Storm Water Monitoring Program staff will physically locate each targeted outfall. Once an outfall has been located in the field, the physical description of the outfall will be recorded in a field logbook. The physical characteristics to be recorded will include the dimensions of the storm sewer pipe, a description of any stains, deposition or vegetative growth present and any other site-specific information that may be relative to the screening efforts. If flow exists at an outfall, a sample will be collected and flow conditions, discharge color and odor information will be recorded.

Samples will be tested for pH, TDS, temperature, ammonia, chlorine, detergents, TPH, fluoride, potassium and chromium using Hach field test kits and hand held Oakton probes to help determine the possible source. The City's Spills and Complaints Response Program (SCRP) staff will be notified of the flow and results of the analyses. If flow is present at an outfall, the outfall will be resampled after eight hours but before 24 hours to determine if any changes in the discharge have occurred. Any change in analyses will be reported to SCRP.

Program Schedule

As noted previously, the Storm Water Monitoring Program staff will work in dry weather periods throughout the permit period to evaluate storm water outfalls in each of the twenty-eight watersheds found within the City's permit area. Building on experience from the screening during the first permit, the dry weather screening program will focus on fewer watersheds, concentrating on those most likely to have illicit connections.

The following is a list of the watersheds that will be included in the screening program:

- Blunn
- Boggy
- Bull
- Buttermilk
- Carson
- Country Club E
- Country Club W
- East Bouldin
- Fort Branch
- Harper's Branch
- Huck's Slough
- Johnson
- Little Walnut
- Shoal
- South Boggy
- Tannehill
- Taylor Slough S.
- Taylor Slough N.
- Lady Bird
- Waller
- Walnut
- West Bouldin
- West Bull

B. Wet Weather Screening

Introduction

The general topography of the City of Austin is characterized by a large number of natural streams and tributaries that serve as the primary conveyance of storm water through the City. As such, the municipal separate storm sewer system (MS4) is comprised of numerous pipe networks that carry storm water runoff from a limited drainage area to the nearest waterway.

Program Activities Description

In order to satisfy the TPDES storm water permit requirements related to wet weather monitoring, the City of Austin will use a visual assessment to provide a post-storm event evaluation of the storm water runoff in the Austin area waterways.

The program will be implemented over the five year permit term, using watersheds as the basis for defining the City's MS4 and measuring program progress. The City anticipates that the wet weather monitoring program will accomplish the following objectives over the permit period:

- Provide a tool to detect excessive levels of pollutants in waterways after storm events
- Provide information related to the type of pollutants present in waterways after storm events
- Provide a tool for investigating the origin of pollutants
- Provide a limited assessment of storm water impact on aquatic life
- Provide a tool to detect acute pollution events

Site Selection

Because the majority of the MS4 discharges into nearby waterways, the City will use watersheds to define the MS4 areas and track the progression of the monitoring activities. The proposed monitoring sites within each watershed have been selected based on the following criteria:

- within the City's permit area
- along the main stem of the stream
- longitudinal distribution along the stream length
- ability for staff to access site safely
- ability to determine the MS4 area discharging to the stream segment upstream of the site;

Site Locations

The wet weather monitoring program will complete visual assessments of storm water flow in the following watersheds: Barton, Blunn, Bull, Buttermilk, Carson,

Country Club East, Country Club West, Decker, Dry Creek, Eanes, East Bouldin, West Bouldin, Fort Branch, Harper's Branch, Huck's Slough, Johnson, Little Walnut, North Boggy, South Boggy, Tannehill Branch, Taylor Slough North, Taylor Slough South, Waller, Walnut, West Bouldin, West Bull, and Williamson.

Program Procedures

Each watershed monitoring site(s) will be screened at least once during the permit term. A visual assessment of storm water flow will be completed at each monitoring site within 36 hours of a storm event. For the purposes of this monitoring program, a storm event will be defined as any event with greater than 0.10 inches of rain. After determining that a storm event has occurred within the target watersheds, WPD staff will conduct a visual evaluation related to the type of pollutants that may be present in the storm water flow at each monitoring site. WPD staff will review each monitoring site assessment form for indications of elevated pollutant levels. If unusual conditions exist at a monitoring location, the WPD Spills and Complaint Response Program (SCRP) may be notified and a complaint investigation could be initiated. If, during an assessment, site conditions indicate that an acute pollutant event may have occurred, the SCRP will be notified immediately, and the SCRP investigator will respond to initiate a detailed investigation of the situation.

Program Schedule

WPD staff will complete an assessment at each monitoring site at least once during the permit period. In doing so, the City will have completed the required wet weather screening of the City's MS4, as defined for the purposes of this monitoring program.

C. Industrial and High Risk Monitoring

Introduction

The AFD and WPD have an Industrial and High Risk Runoff Program that identifies and prioritizes facilities that have the potential to discharge pollutants into the municipal separate storm sewer system (MS4). As part of this effort, staff identify

facilities eligible for NPDES/TPDES storm water discharge permit coverage and request that analytical monitoring data collected by the facility (to comply with state or federal permit requirements) be submitted to the City for review.

Program Activities Description

As noted in the Industrial and High Risk Runoff section of the Storm Water Management Program, most of the type 1 and 2 facilities found in the Austin area are included in one of the industrial activity SIC codes or narrative industrial activity descriptions that require storm water permit coverage. As such, the City of Austin will not conduct any storm water discharge monitoring at facilities where the terms of the TPDES storm water permit are considered by the City to be sufficient, and if the review of the monitoring results (based on monitoring conducted by the facility) are in compliance. This will avoid unnecessary cost and duplication of efforts. If the WPD staff determines that the monitoring results submitted to the City by the facility are not in compliance, a letter will be sent to the facility requesting compliance. If repeated non-compliance occurs, the program will notify the appropriate permitting agency, either EPA or TCEQ, for possible enforcement action. If it is determined that a type 1 or 2 facility included in either the AFD or WPD high-risk inspection program does not meet the eligibility requirements for TPDES storm water permit coverage, a self-monitoring and reporting program will be established for the facility. The City does not anticipate any changes to the monitoring programs. However, changes to the scope of the program components may be considered during review of the City's annual operating budget.

D. Water Quality and Biological Monitoring

1. Barton Springs Complex Sediment Monitoring

The City's ERM division of WPD will continue periodic sediment sampling of Barton Springs and other associated spring outlets as well as sediment monitoring from the contributing watersheds to the Barton Springs Zone. The monitoring will consist of quarterly monitoring at Barton Springs; annual sampling of Eliza, Old Mill,

and Upper Barton Springs, where accumulations of sediment and flow conditions allow for collection. The type of parameters to be analyzed will include metals, oil and grease, semi-volatile organics, petroleum hydrocarbons, polychlorinated biphenyls and selected pesticides.

2. Barton Springs Complex Water Quality Monitoring

WPD will conduct a variety of ambient and storm water monitoring during the permit period,

- Intensive spring outlet and surface water sampling will continue at Barton Springs Pool. The frequency will be sufficient to identify trends that threaten this water resource in a timely manner. Sampling will occur at a minimum on a monthly basis and include analysis for nutrients and Total Suspended Solids (TSS).
- Water quality sampling will be conducted at Barton Springs and at the other associated spring outlets on an annual basis. Samples will be analyzed for an extensive suite of parameters including metals, volatiles, semivolatiles, bacteria and selected pesticides and herbicides. Parameters approaching levels of concern or detected frequently enough that trends may be examined will be examined at a minimum biannually.
- A data logger will be continually deployed (except for maintenance and data retrieval) at a cave at the bottom of Barton Springs Pool to collect basic physical parameters.

3. Environmental Integrity Index (EII)

During the five year permit period, the Environmental Resource Management Division of the WPD will continue to monitor and assess the ecological integrity and the degree of impairment of creeks within the watersheds of the Barton Springs Zone (BSZ) using the Environmental Integrity Index (EII). ERM staff will conduct EII assessments of the Onion Creek, Barton Creek, Little Barton Creek, Williamson Creek, Slaughter Creek, Bear and Little Bear Creek watersheds located within the Barton Springs Zone on a semi-annual monitoring schedule.

The following six protection categories (sub-indices) are used in the EII:

- **Contact Recreation (Swimming/Wading)** - The suitability of a water body for contact recreational use is evaluated using *Escherichia coli* bacteria concentration, which is an indicator of fecal contamination. Concentration numbers are converted to an index score relative to common State of Texas criteria for human health protection.

- **Non-Contact Recreation/Aesthetic** - The parameters included in the non-contact recreation field assessment include water surface appearance, litter, odor, clarity and percent algae cover. Scoring is primarily from visual assessment by trained staff.

- **Water Quality** - Water quality subcomponents are calculated from chemical analysis of grab samples from all study sites during baseflow conditions.

- **Sediment Quality -** Sediment sampling is also conducted at one site in each watershed located near the mouth. Scoring is from concentration data compared to local reference conditions for water and aquatic toxicity effects levels published for sediment.

- **Habitat Quality Index** - Parameters used to measure habitat quality include instream cover, embeddedness, velocity/depth regimes, channel alteration, sediment deposition, frequency of riffles, channel flow status, condition of banks and riparian zone width. Scoring is from field measurements and visual assessment by trained staff.

- **Aquatic Life Support** - Aquatic life support evaluates biological health using benthic macroinvertebrate and diatom community structure. Scoring is from biological indices calculated from taxonomic identification and compared to a reference condition.

Scores of the six sub-indices are averaged to obtain one EII score for each monitoring site. EII scores range from 0 to 100 and are characterized by using the following eight ranges: very bad (0-12), bad (13-25), poor (26-37), marginal (38-50), fair (51-62), good (63-75), very good (76-87), and excellent (88-100). Overall watershed scores are determined by averaging the site specific scores for all reaches within the watershed.

4. Critical Environmental Feature Protection

Critical Environmental Feature (CEF) is defined by COA Land Development Code, and includes wetlands, springs, seeps, rim rocks, bluffs, sinkholes and caves. Protective buffers from 150 feet to 300 feet are typically established to protect the character and function of CEF during and after the development process. During the site development permit application process, City of Austin staff review site plans for large-scale residential and commercial development to ensure that critical environmental features are properly identified and buffered from the development. These buffers are critical to maintaining the quality and quantity of recharge to karst aquifers, maintaining the stability of vertical rock outcrops, and maintain the water quality functions of wetlands. The number of CEF identified, and protective CEF buffers established by COA staff will reported annually.

Appendix C

Wet Weather Screening Field Sheets

City of Austin
Wet Weather Monitoring Program
Field Observation Form

Date: 6/27/2017 **Watershed:** E. Bouldin **Observations by:** Lee C. Lawson

Signature: Lee C. Lawson

Site No. 119 **Location Description:** East Bouldin Creek Elizabeth St. S.1st School for the Deaf

	Level of Concern				
Oily Sheen:	[0]	1	2	3	Comments:
Discolored Water:	[0]	1	2	3	Comments:
Turbid Water:	[0]	1	2	3	Comments:
Trash or Debris:	0	[1]	2	3	Comments:
Odor Detected?	Y	[N]			Comments:
Aquatic Life Affected?	Y	[N]			Comments:

Other Observations:

Site No. 107 **Location Description:** East Bouldin Creek @ El Mercado

	Level of Concern				
Oily Sheen:	[0]	1	2	3	Comments:
Discolored Water:	[0]	1	2	3	Comments:
Turbid Water:	[0]	1	2	3	Comments:
Trash or Debris:	0	[1]	2	3	Comments:
Odor Detected?	Y	[N]			Comments:
Aquatic Life Affected?	Y	[N]			Comments:

Other Observations:

Site No. _____ **Location Description:** _____

	Level of Concern				
Oily Sheen:	0	1	2	3	Comments:
Discolored Water:	0	1	2	3	Comments:
Turbid Water:	0	1	2	3	Comments:
Trash or Debris:	0	1	2	3	Comments:
Odor Detected?	Y		N		Comments:
Aquatic Life Affected?	Y		N		Comments:

Other Observations:

Level of Concern Legend

0 = No impact evident 1 = Minimal impact evident 2 = Moderate impact evident 3 = Severe impact evident

Were the field conditions recorded above observed within 36 hours of a storm event? Y N [Y]

Note: If any site receives three or more "Level 3" ratings, or if the aquatic life appears to be affected, please notify the SCRP Hotline at 974-2550 immediately.

If the SCRP was called, which site(s) were reported? Site No.(s): _____

City of Austin
Wet Weather Monitoring Program
Field Observation Form

Date: 6/27/2017 **Watershed:** West Bouldin **Observations by:** Lee C. Lawson

Signature: Lee C. Lawson

Site No. 878 **Location Description:** West Bouldin Creek @ Jewell dead ends

Level of Concern					
Oily Sheen:	[0]	1	2	3	Comments:
Discolored Water:	0	[1]	2	3	Comments:
Turbid Water:	0	[1]	2	3	Comments:
Trash or Debris:	0	[1]	2	3	Comments:
Odor Detected?	Y	[N]			Comments:
Aquatic Life Affected?	Y	[N]			Comments:

Other Observations:

Site No. 845 **Location Description:** West Bouldin Creek 50 feet upstream of Mary St. Bridge

Level of Concern					
Oily Sheen:	[0]	1	2	3	Comments:
Discolored Water:	0	[1]	2	3	Comments:
Turbid Water:	0	[1]	2	3	Comments:
Trash or Debris:	0	[1]	2	3	Comments:
Odor Detected?	Y	[N]			Comments:
Aquatic Life Affected?	Y	[N]			Comments:

Other Observations:

Site No. _____ **Location Description:** _____

Level of Concern					
Oily Sheen:	0	1	2	3	Comments:
Discolored Water:	0	1	2	3	Comments:
Turbid Water:	0	1	2	3	Comments:
Trash or Debris:	0	1	2	3	Comments:
Odor Detected?	Y		N		Comments:
Aquatic Life Affected?	Y		N		Comments:

Other Observations:

Level of Concern Legend

0 = No impact evident 1 = Minimal impact evident 2 = Moderate impact evident 3 = Severe impact evident

Were the field conditions recorded above observed within 36 hours of a storm event? Y N [Y]

Note: If any site receives three or more "Level 3" ratings, or if the aquatic life appears to be affected, please notify the SCRP Hotline at 974-2550 immediately.

If the SCRP was called, which site(s) were reported? Site No.(s): _____

Appendix D

Facilities List City of Austin

Name	Address
Airport Fire & Rescue	3300 General Aviation Ave
Fire Investigations / Labor Relations Office	1621 Nash Hernandez
Fire Station 01/ EMS 06	401 E 5th Street
Fire Station 02	506 W MLK Blvd
Fire Station 03	201 W. 30th St.
Fire Station 04	1000 Blanco
Fire Station 05 / EMS 04	1202 Webberville Rd
Fire Station 06	1705 S Congress Ave
Fire Station 07	201 Chicon
Fire Station 08 / EMS 07	8989 Research Blvd
Fire Station 09	4301 Speedway
Fire Station 10	3009 Windsor Road
Fire Station 11	1611 Kinney Ave
Fire Station 12	2109 Hancock Drive
Fire Station 14 / Special Operations	4305 Airport Blvd
Fire Station 15	829 Airport Blvd
Fire Station 16	7000 Reese Lane
Fire Station 17	4128 S 1st Street
Fire Station 18	6311 Berkman Drive
Fire Station 19 / EMS 08	5211 Balcones Dr.
Fire Station 20 / EMS Station 02	6601 Manchaca Rd
Fire Station 21	4201 Spicewood Sprgs
Fire Station 22 / EMS Station 12	5309 E Riverside Dr
Fire Station 23 / EMS 13	1330 E Rundberg Lane
Fire Station 24 / EMS Station 28	5811 Nuckols Crossing Rd
Fire Station 25 / EMS Station 10	5228 Duval Rd
Fire Station 26	6700 Wentworth Road
Fire Station 27	5401 McCarty Lane
Fire Station 28	2410 Parmer Lane
Fire Station 29	3704 Deer Lane
Fire Station 30/ EMS 18	1021 W. Braker Lane
Fire Station 31	5507 RR 2222
Fire Station 32	2804 Montebello Road
Fire Station 33	9409 Bluegrass
Fire Station 34 / EMS27	10041 Lake Creek Pkwy
Fire Station 35	5500 Burleson Road
Fire Station 36/ EMS 15	400 Ralph Ablanedo Dr.
Fire Station 37	8700 Hwy 71 West
Fire Station 38 / EMS 19	10111 Anderson Mill Rd.
Fire Station 39 / EMS 16	7701 River Place Blvd.
Fire Station 40 / EMS 29	12711 Harris Glenn Dr.
Fire Station 41 / EMS 35	11205 Harris Branch Pkwy
Fire Station 42 / EMS 30	2454 Cardinal Loop
Fire Station 43 / EMS 31	11401 Escarpment Blvd
Fire Station 44	11612 Four Iron Dr.
Fire Station 45 / EMS 34	9421 Spectrum Blvd.

Fire Training Facility	4800-B Shaw Lane
Fire Vehicle Maintenance Shop	2011 E 51st Street
Fire Wellness / Fire Safety / OMD / EMS Clinical Practice	517 S Pleasant Valley Rd.
Operations Annex	4301 E 5th Street
St. John's Multi-Purpose Center	7500 Blessing Ave.
Air Support	4309 E General Aviation Ave.
Airport Police	3601 Bergstrom
Austin Park Police	2215 Westlake Dr.
Austin Police Patrol Building	E. 8th Street
Austin Ridge	8501 F.M. 969 Bldg. 512
Community Liason	4101 S Industrial, #260
CTECC	5010 Old Manor Rd.
Downtown Rangers	211 E. 7th Street
East Substation and Forensics	812 Springdale Rd.
Evidence Warehouse	4708 E. MLK Bvd.
Forensics Vehicle Processing	8200 South Congress
Mental Health Unit / Austin State Hospital	4110 Guadalupe
Mounted Patrol	8011 Boyce Lane
North Substation	12435 Lamplight Village Ave
Police Headquarters	715 E. 8th Street
Police Training Academy / Pistol Range	4800 Shaw Lane
South Substation	404 Ralph Ablanedo Dr.
Travis County Jail - Interlocal Agreement	509 W 11th Street
???	1111 Rio Grande St.
???	1501 Toomey Road
???	400 Jessie Street
???	6014 Techni Center
Davis Water Treatment Plant	3500 W 35th Street
East Service Center	6301 Harold Ct.
Glen Bell Service Center	3907 S Industrial Dr
Govalle WWTP Office/Administration	911 Linger Lane
Hornsby Bend	2210 S FM 973
North Service Center	907 W. Koenig Lane
Reicher Ranch (Wildlife Conservation)	3635 RR 620 South
SAR WWTP Administration Bldg	13009 Fallwell Lane
Summit Hill Water Quality Lab	14050 Summit Drive, #121
Ullrich Water Treatment Plant	1000 Forest View
Ullrich Water Treatment Plant	1001 Forest View
Waller Creek Center	625 E. 10th St.
Walnut Creek WWTP	7113 E. MLK
Watershed is occupying building	6301 Harold Ct.
Watershed is occupying building	6301 Harold Ct.
Watershed Protection/Storm Sewer/Concrete/Cleaning - Bldg C	6301 Harold Ct.
Webberville Service Center	2600 Webberville Rd
NA	*105 Riverside Dr.*
CTM Administration	105 East Riverside Dri
CTM Wireless Communication services Bldg	Bolm Road

???	201 E. 2nd St.
EMS Station 01 Rescue/Dist Cmdr s04	3616 South 1st St
EMS Station 03 Rescue	1305 Red River-Brackenridge Hospital
EMS Station 04/Dist Cmdr 5	1201 Webberville Rd
EMS Station 05/Dist Cmdr 2	5710 N Lamar
EMS Station 09	1211 Lohmans Crossing, Lakeway
EMS Station 14 / EMS Demand 2	7200 Berkman
EMS Station 17	2507 Foster Ave
EMS Station 20	911 W. Pfluger Loop, Pfluggerville
EMS Station 21	1295 S Capital of Texas Hwy., Westlake
EMS Station 22 Rescue	3605 Allegiance Cove, Lago Vista
EMS Station 23	400 W. Parsons Ave., Manor
EMS Station 24	5412 US 183 South, Travis Co.
EMS Station 25	18310 Park Drive, Jonestown
EMS Station 26	22404 Hyw 71 West, Pedernales
EMS Station 32	3621 S. FM 620, Bee Caves
EMS Station 34	9400 Spectrum
Fleet Acquisition	6400 Bolm Road
Fleet Administration	1190 Hargrave
Service Center 01	6301 Harold Ct.
Service Center 03	2011 E. 51st St.
Service Center 05	714 E. 8th
Service Center 06	1182 Hargrave
Service Center 12	4108 Todd Lane
Service Center 13	2412 Kramer Lane
Truck Washing Service Center 6	1190 Hargrave
Adminstration Offices	8301 Cameron Road
Bldg Svcs	301 W. 2nd St.
Bldg Svcs	3600 Manor Rd.
Building Services HQ	411 Chicon St.
City Hall	301 W. 2nd St.
Municipal Building	124 W 8th St.
One Texas Center	505 Barton Spring Rd
Purchasing	13005 Fallwell Lane
Purchasing	2001 E 5th St.
Purchasing	2526 Kramer Lane
Purchasing	721 Barton Springs Rd.
Purchasing	8003 Decker Lane
Rebekah Baines Johnson Center (RBJ)	15 Waller St.
RLC	1520 Rutherford Lane
Service Center 8	4411 Meinardus
Technicenter	4201 Ed Bluestein Blvd
Treasury	*700 Lavaca St.*
Animal Shelter	7201 Levander Loop
Austin Resource Center for the Homeless (ARCH)	500 E. 7th Street
Bastrop/Elgin WIC	443 Highway 71
Blackland Neighborhood Center	2005 Salina

Clarksville Health Center	1000 Toyath
Day Labor	2201 E. Ben White
Day Labor (First Workers)	4916 N. IH-35
Del Valle WIC	3518 FM 973
Dove Springs WIC	5405 S Pleasant Valley
East Austin Neighborhood Center	211 Comal St.
Elgin WIC	218 South Main Street
Far South Austin Health Center	405 W. Stassney Lane
HIV/STD Prevention Outreach Counseling and Testing	7901 Cameron Road
Homeless Center for Woman & Children	4523 Tannehill Lane
Manor WIC	600 West Carrie Manor
Montopolis Neighborhood Center	1416 Montopolis
Northeast WIC	7112 Ed Bluestein Road
Northwest WIC Mom's Place	8701 Research Blvd
Oak Hill WIC	8656 Hwy 71 Bldg A Ste B
Palm Square	1000 N. IH 35, #1000
Pflugerville WIC	15822 Foothill Farms Loop, Ste B
Rosewood Zaragoza Neigh Ctr	2800 Webberville Road
South Austin Neighborhood Ctr	2508 Durwood
St. John's Neighborhood Annex (AK Black Clinic Bldg)	928 Blackson Ave.
Street and Jones	1000 E. 11th St.
Todd Lane	4122 Todd Lane
Town Lake Animal Center	1156 W Cesar Chavez St
Twin Towers	*1106 Clayton Lane Suite 204 E*
???	*1050 E 11th Street, Suite 300*
Arthur B. Dewitty Center	2209 Rosewood Ave.
Learning and Research Ctr, Building #4218	2800 Spirit of Texas Dr
Texas Worksource Center	4175 Freidrich Lane, Suite 200
Texas Worksource Center	6505 Airport Blvd. Suite 101
Austin History Center	810 Guadalupe
Carver Branch	1161 Angelina
Central Lib./Faulk Central	800 Guadalupe
Daniel E. Ruiz Branch Lib	1600 Grove Blvd
Howson Branch	2500 Exposition
Little Walnut Creek Branch	835 W Rundberg Lane
Manchaca Branch	5500 Manchaca Rd
Milwood Branch	12500 Amherst Dr.
New Twin Oaks/S.A.Lib Warehouse	1800 S. Fifth St
North Village Branch	2505 Steck Ave.
Oak Springs Branch	3101 Oak Spring Dr.
Old Quarry Branch	7051 Village Center Dr.
Pleasant Hill Branch	211 E. William Cannon Dr.
Reycled Reads Book Store	5335 Burnet Rd
Southeast Austin Community Branch	5803 Nuckols Crossing Rd
Spicewood Springs Branch	8637 Spicewood Sprgs Rd
Terrazas Branch	1105 E Cesar Chavez
University Hills Branch	4721 Loyola Ln.

Will Hampton Branch at Oak Hill	5125 Convict Hill Road
Windsor Park Branch Lib.	5833 Westminster Dr.
Yarborough Branch	2200 Hancock Dr
Zaragoza Warehouse	651 N. Pleasant Valley Rd
Court Substation - Cherry Creek Plaza	5738 Manchaca Road
DACC	719 E. 6th Steet
Municipal Courts	700 E. 7th St
Alamo Recreation Center	2100 Alamo St
ANC-Main Bldg	301 Nature Center Dr.
Aquatics Adminstration Facility	401 Deep Eddy Ave.
Austin Memor.Cemet/Off.Complex	2800 Hancock Dr.
Austin Recreation Center	1301 Shoal Creek Blvd
Barton Springs Pool Bath House	2201 Barton Sprgs Rd
Camacho Recreation Center	34 Robert T. Martinez
Central Maintenance Complex	2525 Lakeshore Blvd
Conley Guerrero Sr Activity Ctr	808 Niles Street
Danny G McBeth Rec Ctr	2502 Columbus Drive
Dittmar Recreation Center	1009 W Dittmar
Dottie Jordan Rec Ctr	2803 Loyola Lane
Dougherty Arts Center Complex	1110 Barton Springs Rd
Dove Springs Recreation Ctr	5801 Ainez Drive
Elisabet Ney Museum & Studio	304 E 44th Street
Emma Long Metro Park-Office	1600 City Park Rd
Garrison Park - South District Maintenance Office	6001 Manchaca Rd.
George Washington Carver Museum and Cultural Center	1165 Angelina Street
Givens Recreation Center	3800 E 12th St
Gus Garcia Recreation Center	1201 Easr Rundberg Lane
Hancock Recreation Center	811 E 41st St
Jimmy Clay Golf Course/Residence	5400 Jimmy Clay Dr
Kreig Athletic Office	515 S Pleasant Valley Rd.
Lamar Senior Activity Center	2874 Shoal Crest Ave
Lions Muni G.C Caretakers Residence	2910 Enfield Rd
Metz Recreation Center	2411 Canterbury
Mexican American Cultural Arts Center	600 River St
Montopolis Recreation Center	1200 Montopolis Drive
Morris Wms Residence	4305 Manor Road
Northwest Recreation Center	2913 Northland Dr
O'Henry & Dickenson Museums	409 E 5th Street
Old Lundberg Bakery and Emporium	1006 Congress Ave
Pan American Rec Ctr	2100 E 3rd Street
PARD Annex Building	919 W. 28th 1/2 Street
PARD Headquarters	200 S Lamar
Park 183	720 Bastrop Hwy #218 B
Pickfair Recreation Center	10904 Pickfair Drive
Rosewood Recreation Center	1182 N. Pleasant Valley
South Austin Recreation Center	1100 Cumberland
South Austin Senior Activity Center	3911 Manchaca Road

Town Lake - Fiesta Gardens Maintenance Building	2101 Bergman Ave
Turner Roberts Rec Center	7201B Colony Loop Dr
W.E Long Lake Metro - NE District Maintenace Building	6614 Blue Bluff Rd
Walnut Creek Metro - Northwest District Maint Bldg	1401 Cedar Bend Dr
Zaragosa Recreation Center	2608 Gonzales
Zilker Caretaker House	200 Clubhouse Road
Zilker Grd. Ctr. Caretaker Residence (Park Ranger Station)	2200 B Barton Springs Rd.
Zilker Grd. Ctr. Maintenance Building	2200 A Barton Springs Rd.
Home Hazardous Waste Office	2514 Business Center Dr.
Landfill Office	10108 FM 812
Todd Lane Service Center	4108 Todd Lane
Transfer Station - MRF	3810 Todd Lane
Administrative Buildings/South District/Erosion - Bldg H	6301 Harold Ct.
Drainage Maintenance North Service Yard	2412 Kramer Lane
New Field Operations Facility - Ponds/Erosion	4805 Winnebago
Pond Maintenance	5109 E. Ben White Blvd.
Storage unit; emergency response supplies/education materials	1033 E. 41st Street
WPD Education Materials and Miscellaneous Storage	*510 S. Congress; Suite 211*

Appendix E

Barton Springs Periodic Sediment Sampling Data

PARAMETER	UNIT	Barton Spring			Eliza	Old Mill	Upper Barton
		12/14/16	07/06/17	08/22/17	07/06/17	07/06/17	07/06/17
2_4_5-TP (SILVEX)	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
2_4_5-TRICHLOROPHENOXYACETIC ACID	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
2_4-DICHLOROPHENOXYACETIC ACID	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
4_4'-DDD	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
4_4'-DDE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
4_4'-DDT	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ACENAPHTHENE	MG/KG	<J0.0155	<J0.00736	<J0.00767	<J0.00874	<J0.00747	<J0.00541
ACENAPHTHYLENE	MG/KG	<J0.0155	<J0.00736	<J0.00767	<J0.00874	<J0.00747	<J0.00541
ALDRIN	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ALPHA-BHC (BENZENE HEXACHLORIDE)	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ALPHA-CHLORDANE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ANTHRACENE	MG/KG	<J0.0155	<J0.00736	J0.00917	<J0.00874	<J0.00747	<J0.00541
AROCLOR 1016	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
AROCLOR 1221	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
AROCLOR 1232	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
AROCLOR 1242	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
AROCLOR 1248	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
AROCLOR 1254	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
AROCLOR 1260	MG/KG	.	<J0.0736	.	<J0.0835	<J0.0773	<J0.0556
ARSENIC	MG/KG	8.22	9.06	7.93	8.15	7.49	8.22
ATRAZINE (AATREX)	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
AZINPHOS METHYL (GUTHION)	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
BENZO(A)ANTHRACENE	MG/KG	J0.0336	0.0288	0.184	<J0.00874	<J0.00747	0.0168
BENZO(A)PYRENE	MG/KG	J0.0486	0.047	0.243	<J0.00874	<J0.00747	0.0238
BENZO(B)FLUORANTHENE	MG/KG	J0.0583	0.0559	0.254	<J0.00874	<J0.00747	0.0286
BENZO(E)PYRENE	MG/KG	J0.0439	0.0435	0.195	<J0.00874	<J0.00747	0.0238
BENZO(GHI)PERYLENE	MG/KG	J0.048	0.0416	0.129	<J0.00874	<J0.00747	0.0232
BENZO(K)FLUORANTHENE	MG/KG	J0.0291	0.0287	0.127	<J0.00874	<J0.00747	0.0156
BETA-BHC (BENZENE HEXACHLORIDE)	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
CADMIUM	MG/KG	<J0.154	<J0.143	<J0.119	<J0.168	<J0.148	J0.114
CARBARYL (SEVIN)	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
CHLORPYRIFOS (DURSBAN)	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
CHLORPYRIFOS METHYL	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
CHROMIUM	MG/KG	18.1	17.2	14.9	17.4	15.6	6.44
CHRYSENE	MG/KG	J0.0527	0.0526	0.233	<J0.00874	<J0.00747	0.0262
COPPER	MG/KG	8.95	7.41	6.65	8.56	8.85	2.68
DALAPON	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
DELTA-BHC (BENZENE HEXACHLORIDE)	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
DEMETON	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
DIAZINON	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
DIBENZ(AH)ANTHRACENE	MG/KG	<J0.0155	<J0.00736	0.0292	<J0.00874	<J0.00747	<J0.00541
DICAMBA (BANVEL)	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
DIELDRIN	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
DINOSEB	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
ENDOSULFAN I	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ENDOSULFAN II	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ENDOSULFAN SULFATE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ENDRIN	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ENDRIN ALDEHYDE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
ENDRIN KETONE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
FLUORANTHENE	MG/KG	J0.0605	0.087	0.364	<J0.00874	<J0.00747	0.0438
FLUORENE (9H-FLUORENE)	MG/KG	<J0.0155	<J0.00736	<J0.00767	<J0.00874	<J0.00747	<J0.00541

PARAMETER	UNIT	Barton Spring			Eliza	Old Mill	Upper Barton
		12/14/16	07/06/17	08/22/17	07/06/17	07/06/17	07/06/17
GAMMA-BHC (LINDANE)	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
GAMMA-CHLORDANE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
HEPTACHLOR	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
HEPTACHLOR EPOXIDE	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
INDENO(1_2_3-CD)PYRENE	MG/KG	J0.0461	0.0463	0.187	<J0.00874	<J0.00747	0.0248
IRON	MG/KG	10900	10600	9350	11400	10900	11200
LEAD	MG/KG	11.8	10.5	9.88	9.13	11.4	6.28
MALATHION	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
MERCURY	MG/KG	J0.0295	<J0.0243	J0.0245	J0.0297	<J0.0229	<J0.0166
METHOXYCHLOR	MG/KG	<J0.0031	<J0.00294	<J0.00307	<J0.0035	<J0.00299	<J0.00216
METHYL PARATHION	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
NAPHTHALENE	MG/KG	<J0.0155	<J0.00736	<J0.00767	<J0.00874	<J0.00747	<J0.00541
NICKEL	MG/KG	18.1	14.6	13	13.7	10	5.72
OIL AND GREASE	MG/KG	N15.4	19.4	JN14.2	J12.8	J5.79	34.2
ORGANIC CARBON	MG/KG	38500	36700	11300	51300	70300	62500
PARATHION (PARATHION ETHYL)	MG/KG	.	<J0.00294	.	<J0.0035	<J0.00299	<J0.00216
PENTACHLOROPHENOL	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
PERCENT MOISTURE	%	37.05584	36.55536	36.65339	44.99572	37.38739	14.44527
PETROLEUM HYDROCARBONS >C12-C28	MG/KG	<J10.8	<J10.9	<J10.7	J13.6	<J11.2	<J8.15
PETROLEUM HYDROCARBONS >C28-C35	MG/KG	<J10.8	<J10.9	<J10.7	<J12.7	<J11.2	<J8.15
PETROLEUM HYDROCARBONS C6-C12	MG/KG	<J10.8	<J10.9	<J10.7	<J12.7	<J11.2	<J8.15
PETROLEUM HYDROCARBONS C6-C35	MG/KG	<J10.8	<J10.9	<J10.7	J13.6	<J11.2	<J8.15
PHENANTHRENE	MG/KG	<J0.0155	0.0353	0.0555	<J0.00874	<J0.00747	0.0125
PICLORAM	UG/KG	.	<J2.99	.	<J3.31	<J3.06	<J2.43
PYRENE	MG/KG	J0.0507	0.069	0.316	<J0.00874	<J0.00747	0.0356
SILVER	MG/KG	<J0.154	<J0.143	<J0.119	<J0.168	<J0.148	<J0.11
SOLUBLE AMMONIA AS N	MG/KG	2.92	9.39	8.23	11.6	5.25	J1.03
TEXTURE CLAY (<0.002MM)	%	12.1	10.6	38.6	14	14.6	8.14
GRAVEL AND COARSE SAND(>2.00MM)	%	1.55	11.6	0.428	12.7	2.37	73.1
TEXTURE SAND (0.05-2.0MM)	%	60.5	60	51.2	58	69	12.8
TEXTURE SILT (0.002-0.05MM)	%	25.9	17.8	9.72	15.2	13.9	5.97
TOTAL CHLORDANE	MG/KG	<J0.0031	<J0.0147	<J0.00307	<J0.0175	<J0.0149	<J0.0108
TOXAPHENE	MG/KG	<J0.124	<J0.118	<J0.123	<J0.14	<J0.12	<J0.0866
ZINC	MG/KG	29.7	23.5	20.2	35.3	25	11.5

Appendix F

Barton Springs and Associated Springs Water Quality Data

Barton Springs Biweekly Monitoring. Conventional water quality parameters measured at Barton Springs Pool in the FY 2017 reporting period.

	NH3-N	E. coli	NO3+NO2-N	ORTHO-P	TSS	VSS
Date	MG/L	MPN/100ML	MG/L	MG/L	MG/L	MG/L
18-Oct-2016	<J0.008	24.9	1.44	<J0.004	2	<J1
01-Nov-2016	<J0.008	2	1.48	<J0.004	1.4	<J1
17-Nov-2016	<J0.008	5.21	1.3	<J0.02	<J2	<J2
14-Dec-2016	<J0.008	18.5	1.19	<J0.004	1	.
04-Jan-2017	<J0.008	34	1.4	<J0.004	<J1	<J1
25-Jan-2017	<J0.008	228	1.26	<J0.004	<J1	<J1
08-Feb-2017	<J0.008	7.45	1.28	<J0.004	8.5	<J1
22-Feb-2017	<J0.008	67.6	0.992	<J0.004	1.2	<J1
08-Mar-2017	0.116	19.9	1.28	<J0.004	1.2	<J1
22-Mar-2017	<J0.008	4.04	1.19	<J0.004	2.6	<J1
26-Apr-2017	<J0.008	5.21	1.19	<J0.004	3.6	<J1
16-May-2017	<J0.008	4.04	1.3	<J0.004	2.4	1.3
31-May-2017	<J0.008	1	1.42	<J0.004	1.2	<J1
15-Jun-2017	<J0.008	9.79	1.19	<J0.004	<J1	.
05-Jul-2017	0.0292	48.1	1.24	<J0.004	<J2	<J2
20-Jul-2017	<J0.008	6.26	1.35	<J0.004	<J1	<J1
03-Aug-2017	<J0.008	<J1	1.85	<J0.004	<J1	.
16-Aug-2017	<J0.008	14.8	1.49	<J0.004	<J1	<J1
06-Sep-2017	<J0.008	21.8	1.38	<J0.004	2.6	1
20-Sep-2017	<J0.008	11	1.76	<J0.004	1.2	.

Barton Springs and Associated Springs – Semi-annual and Annual Monitoring.
Expanded analyses at Barton Springs in the FY2017 reporting period.

PARAMETER	UNIT	14-Dec-2016	26-Apr-2017	15-Jun-2017	03-Aug-2017	20-Sep-2017
1_1_1-TRICHLOROETHANE	UG/L	.	<J2	.	.	.
1_1_2_2-TETRACHLOROETHANE	UG/L	.	<J2	.	.	.
1_1_2-TRICHLOROETHANE	UG/L	.	<J2	.	.	.
1_1-DICHLOROETHANE	UG/L	.	<J2	.	.	.
1_1-DICHLOROETHYLENE	UG/L	.	<J2	.	.	.
1_2_3-TRICHLOROBENZENE	UG/L	.	<J2	.	.	.
1_2_3-TRICHLOROPROPANE	UG/L	.	<J2	.	.	.
1_2_4_5-TETRACHLOROBENZENE	UG/L	.	<J3.94	.	.	.
1_2_4-TRICHLOROBENZENE	UG/L	.	<J1.97	.	.	.
1_2-DIBROMO-3-CHLOROPROPANE	UG/L	.	<J2	.	.	.
1_2-DIBROMOETHANE	UG/L	.	<J2	.	.	.
1_2-DICHLOROBENZENE	UG/L	.	<J1.97	.	.	.
1_2-DICHLOROETHANE	UG/L	.	<J2	.	.	.
1_2-DICHLOROETHENE	UG/L	.	<10	.	.	.
1_2-DICHLOROPROPANE	UG/L	.	<J2	.	.	.
1_2-DIPHENYLHYDRAZINE	UG/L	.	<J1.97	.	.	.
1_3-DICHLOROBENZENE	UG/L	.	<J1.97	.	.	.
1_3-DICHLOROPROPENE	UG/L	.	<10	.	.	.
1_4-DICHLOROBENZENE	UG/L	.	<J1.97	.	.	.
1+2-CHLORONAPHTHALENE	UG/L	.	<J3.94	.	.	.
1-NAPHTHYLAMINE	UG/L	.	<J3.94	.	.	.
2_3_4_6-TETRACHLOROPHENOL	UG/L	.	<J1.97	.	.	.
2_4_5-TP (SILVEX)	UG/L	.	<J0.196	.	.	.
2_4_5-TRICHLOROPHENOL	UG/L	.	<J1.97	.	.	.
2_4_5-TRICHLOROPHENOXYACETIC ACID	UG/L	.	<J0.196	.	.	.
2_4_6-TRICHLOROPHENOL	UG/L	.	<J1.97	.	.	.
2_4-DICHLOROPHENOL	UG/L	.	<J1.97	.	.	.
2_4-DICHLOROPHENOXYACETIC ACID	UG/L	.	<J0.196	.	.	.
2_4-DIMETHYLPHENOL	UG/L	.	<J1.97	.	.	.
2_4-DINITROPHENOL	UG/L	.	<J19.7	.	.	.
2_4-DINITROTOLUENE	UG/L	.	<J3.94	.	.	.
2_6-DICHLOROPHENOL	UG/L	.	<J1.97	.	.	.
2_6-DINITROTOLUENE	UG/L	.	<J1.97	.	.	.
2-CHLOROETHYL VINYL ETHER	UG/L	.	<J2	.	.	.
2-CHLOROPHENOL	UG/L	.	<J1.97	.	.	.
2-HEXANONE (BUTYLMETHYLKETONE)	UG/L	.	<J2	.	.	.
2-METHYLNAPHTHALENE	UG/L	.	<J1.97	.	.	.
2-METHYLPHENOL (O-CRESOL)	UG/L	.	<J1.97	.	.	.
2-NAPHTHYLAMINE	UG/L	.	<J1.97	.	.	.
2-NITROANILINE	UG/L	.	<J1.97	.	.	.
2-NITROPHENOL	UG/L	.	<J1.97	.	.	.
2-PICOLINE (2-METHYLPYRIDINE)	UG/L	.	<J1.97	.	.	.
3_3'-DICHLOROBENZIDINE	UG/L	.	<J1.97	.	.	.
3-METHYLCHOLANTHRENE	UG/L	.	<J1.97	.	.	.
3-NITROANILINE	UG/L	.	<J1.97	.	.	.
4_6-DINITRO-2-METHYLPHENOL	UG/L	.	<J19.7	.	.	.

PARAMETER	UNIT	14-Dec-2016	26-Apr-2017	15-Jun-2017	03-Aug-2017	20-Sep-2017
4-AMINOBIPHENYL	UG/L	.	<J1.97	.	.	.
4-BROMOPHENYL PHENYL ETHER	UG/L	.	<J1.97	.	.	.
4-CHLORO-3-METHYLPHENOL	UG/L	.	<J1.97	.	.	.
4-CHLOROANILINE	UG/L	.	<J1.97	.	.	.
4-CHLOROPHENYL PHENYL ETHER	UG/L	.	<J1.97	.	.	.
4-METHYL-2-PENTANONE (HEXANONE)	UG/L	.	<J2	.	.	.
4-NITROANILINE	UG/L	.	<J3.94	.	.	.
4-NITROPHENOL	UG/L	.	<J3.94	.	.	.
7_12-DIMETHYLBENZO(A)ANTHRACENE	UG/L	.	<J1.97	.	.	.
ACENAPHTHENE	UG/L	.	<J1.97	.	.	.
ACENAPHTHYLENE	UG/L	.	<J1.97	.	.	.
ACETONE	UG/L	.	<J2	.	.	.
ACETOPHENONE	UG/L	.	<J1.97	.	.	.
ACROLEIN	UG/L	.	<J2	.	.	.
ACRYLONITRILE	UG/L	.	<J2	.	.	.
ALKALINITY (AS CACO3)	MG/L	270	272	267	276	273
ANILINE	UG/L	.	<J1.97	.	.	.
ANTHRACENE	UG/L	.	<J1.97	.	.	.
ARSENIC	UG/L	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7
ATRAZINE (AATREX)	UG/L	.	<J1.97	.	.	.
AZINPHOS METHYL (GUTHION)	UG/L	.	<J0.2	.	.	.
BENZENE	UG/L	.	<J2	.	.	.
BENZIDINE	UG/L	.	<J1.97	.	.	.
BENZO(A)ANTHRACENE	UG/L	.	<J1.97	.	.	.
BENZO(A)PYRENE	UG/L	.	<J1.97	.	.	.
BENZO(B)FLUORANTHENE	UG/L	.	<J1.97	.	.	.
BENZO(GHI)PERYLENE	UG/L	.	<J1.97	.	.	.
BENZO(K)FLUORANTHENE	UG/L	.	<J1.97	.	.	.
BENZOIC ACID	UG/L	.	<J19.7	.	.	.
BENZYL ALCOHOL	UG/L	.	<J4.93	.	.	.
BIS(2-CHLOROETHOXY)METHANE	UG/L	.	<J1.97	.	.	.
BIS(2-CHLOROETHYL)ETHER	UG/L	.	<J1.97	.	.	.
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	.	<J1.97	.	.	.
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	.	<J1.97	.	.	.
BORON	MG/L	<J0.02	0.0792	0.0546	<J0.02	<J0.02
BROMACIL	UG/L	.	<J0.195	.	.	.
BROMODICHLOROMETHANE	UG/L	.	<J2	.	.	.
BROMOFORM	UG/L	.	<J2	.	.	.
BUTYL BENZYL PHTHALATE	UG/L	.	<J1.97	.	.	.
CADMIUM	MG/L	.	<J0.0004	.	.	.
CALCIUM	MG/L	99.4	87.3	91.3	91.3	91.7
CARBARYL (SEVIN)	UG/L	.	<J1.97	.	.	.
CARBAZOLE	UG/L	.	<J1.97	.	.	.
CARBON DISULFIDE	UG/L	.	<J2	.	.	.
CARBON TETRACHLORIDE	UG/L	.	<J2	.	.	.
CHLORIDE	MG/L	24.9	26.2	23.8	26.1	24.9
CHLOROBENZENE	UG/L	.	<J2	.	.	.
CHLOROETHANE	UG/L	.	<J2	.	.	.
CHLOROFORM	UG/L	.	<J2	.	.	.
CHLORPYRIFOS (DURSBAN)	UG/L	.	<J0.2	.	.	.

PARAMETER	UNIT	14-Dec-2016	26-Apr-2017	15-Jun-2017	03-Aug-2017	20-Sep-2017
CHROMIUM	UG/L	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7
CHRYSENE	UG/L	.	<J1.97	.	.	.
CIS-1_2-DICHLOROETHENE	UG/L	.	<J2	.	.	.
CIS-1_3-DICHLOROPROPENE	UG/L	.	<J2	.	.	.
COPPER	UG/L	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7
DALAPON	UG/L	.	<J0.196	.	.	.
DEMETON	UG/L	.	<J0.5	.	.	.
DEMETON-O	UG/L	.	<J0.2	.	.	.
DEMETON-S	UG/L	.	<J0.2	.	.	.
DIAZINON	UG/L	.	<J0.2	.	.	.
DIBENZ(AH)ANTHRACENE	UG/L	.	<J1.97	.	.	.
DIBENZO(AJ)ACRIDINE	UG/L	.	<J1.97	.	.	.
DIBENZOFURAN	UG/L	.	<J1.97	.	.	.
DIBROMOCHLOROMETHANE	UG/L	.	<J2	.	.	.
DIBROMOMETHANE	UG/L	.	<J2	.	.	.
DICAMBA (BANVEL)	UG/L	.	<J0.196	.	.	.
DICHLORODIFLUOROMETHANE	UG/L	.	<J2	.	.	.
DIETHYL PHTHALATE	UG/L	.	<J1.97	.	.	.
DIMETHYL PHTHALATE	UG/L	.	<J1.97	.	.	.
DI-N-BUTYL PHTHALATE	UG/L	.	<J1.97	.	.	.
DI-N-OCTYL PHTHALATE	UG/L	.	<J1.97	.	.	.
DINOSEB	UG/L	.	<J0.196	.	.	.
ETHYL METHACRYLATE	UG/L	.	<J2	.	.	.
ETHYLBENZENE	UG/L	.	<J2	.	.	.
ETHYLMETHANE SULFONATE	UG/L	.	<J1.97	.	.	.
FLUORANTHENE	UG/L	.	<J1.97	.	.	.
FLUORENE (9H-FLUORENE)	UG/L	.	<J1.97	.	.	.
FLUORIDE	MG/L	0.148	0.13	0.156	0.186	0.197
HEXACHLOROBENZENE (HCB)	UG/L	.	<J1.97	.	.	.
HEXACHLOROBUTADIENE	UG/L	.	<J1.97	.	.	.
HEXACHLOROCYCLOPENTADIENE	UG/L	.	<J3.94	.	.	.
HEXACHLOROETHANE	UG/L	.	<J1.97	.	.	.
INDENO(1_2_3-CD)PYRENE	UG/L	.	<J1.97	.	.	.
IODOMETHANE	UG/L	.	<J2	.	.	.
IRON	MG/L	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02
ISOPHORONE	UG/L	.	<J1.97	.	.	.
LEAD	UG/L	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4
M+P(META+PARA)XYLENE	UG/L	.	<J4	.	.	.
MAGNESIUM	MG/L	22.7	20.3	21.1	22.2	20.4
MALATHION	UG/L	.	<J0.2	.	.	.
MERCURY	UG/L	.	<J0.07	.	.	.
METHYL BROMIDE (BROMOMETHANE)	UG/L	.	<J2	.	.	.
METHYL CHLORIDE (CHLOROMETHANE)	UG/L	.	<J2	.	.	.
METHYL ETHYL KETONE (2-BUTANONE)	UG/L	.	<J5	.	.	.
METHYL METHANE SULFONATE	UG/L	.	<J1.97	.	.	.
METHYL PARATHION	UG/L	.	<J0.2	.	.	.
METHYL TERT-BUTYL ETHER (MTBE)	UG/L	.	<J2	.	.	.
METHYLENE CHLORIDE	UG/L	.	<J2	.	.	.
MP-CRESOL	UG/L	.	<J3.94	.	.	.
NAPHTHALENE	UG/L	.	<J1.97	.	.	.

PARAMETER	UNIT	14-Dec-2016	26-Apr-2017	15-Jun-2017	03-Aug-2017	20-Sep-2017
NICKEL	UG/L	2.15	<J0.7	<J0.7	<J0.7	<J0.7
NITROBENZENE	UG/L	.	<J1.97	.	.	.
N-NITROSODIETHYLAMINE	UG/L	.	<J3.94	.	.	.
N-NITROSODIMETHYLAMINE	UG/L	.	<J1.97	.	.	.
N-NITROSO-DI-N-BUTYLAMINE	UG/L	.	<J1.97	.	.	.
N-NITROSO-DI-N-PROPYLAMINE	UG/L	.	<J1.97	.	.	.
N-NITROSODIPHENYLAMINE	UG/L	.	<J1.97	.	.	.
N-NITROSOPIPERIDINE	UG/L	.	<J1.97	.	.	.
OIL AND GREASE	MG/L	.	<J2.5	.	.	.
ORGANIC CARBON	MG/L	0.619	0.633	<J0.2	<J0.2	0.513
O-XYLENE	UG/L	.	<J2	.	.	.
PARATHION (PARATHION ETHYL)	UG/L	.	<J0.2	.	.	.
P-DIMETHYLAMINOAZOBENZENE	UG/L	.	<J3.94	.	.	.
PENTACHLOROBENZENE	UG/L	.	<J1.97	.	.	.
PENTACHLORONITROBENZENE	UG/L	.	<J1.97	.	.	.
PENTACHLOROPHENOL	UG/L	.	<J0.196	.	.	.
PETROLEUM HYDROCARBONS >C12-C28	MG/L	.	<J1.95	.	.	.
PETROLEUM HYDROCARBONS >C28-C35	MG/L	.	<J1.95	.	.	.
PETROLEUM HYDROCARBONS C6-C12	MG/L	.	<J1.95	.	.	.
PETROLEUM HYDROCARBONS C6-C35	MG/L	.	<J1.95	.	.	.
PHENACETIN	UG/L	.	<J1.97	.	.	.
PHENANTHRENE	UG/L	.	<J1.97	.	.	.
PHENOL	UG/L	.	<J1.97	.	.	.
PICLORAM	UG/L	.	<J0.196	.	.	.
POTASSIUM	MG/L	1.37	1.38	0.656	1.18	1.2
PRONAMIDE (KERB)	UG/L	.	<J1.97	.	.	.
PYRENE	UG/L	.	<J1.97	.	.	.
PYRIDINE	UG/L	.	<J1.97	.	.	.
SILVER	MG/L	.	<J0.0004	.	.	.
SODIUM	MG/L	16.9	15.5	14.8	14.3	14.2
STRONTIUM	UG/L	743	.	681	882	598
STYRENE	UG/L	.	<J2	.	.	.
SULFATE	MG/L	35.8	34	32	32.5	31.6
TETRACHLOROETHYLENE	UG/L	.	<J2	.	.	.
TOLUENE	UG/L	.	<J2	.	.	.
TOTAL CRESOLS	UG/L	.	<J3.94	.	.	.
TRANS-1_2-DICHLOROETHENE	UG/L	.	<J2	.	.	.
TRANS-1_3-DICHLOROPROPENE	UG/L	.	<J2	.	.	.
TRANS-1_4-DICHLORO-2-BUTENE	UG/L	.	<J2	.	.	.
TRICHLOROETHYLENE (TCE)	UG/L	.	<J2	.	.	.
TRICHLOROFLUOROMETHANE	UG/L	.	<J2	.	.	.
VINYL ACETATE	UG/L	.	<J2	.	.	.
VINYL CHLORIDE	UG/L	.	<J2	.	.	.
XYLENES	UG/L	.	<J5	.	.	.
ZINC	UG/L	<J1.7	<J1.7	<J1.7	<J1.7	<J1.7

Barton Springs and Associate Springs – Semi-annual and Annual Monitoring Conventional analytes at Eliza, Old Mill and Upper Barton springs in FY2017. Quality control replicate samples were collected and data is available upon request, but are not shown in this table.

		Eliza Spring					Old Mill Spring					Upper Barton Spring			
		2016	2017				2016	2017				2016	2017		
PARAMETER	UNIT	12-14	04-26	06-15	08-03	09-20	12-14	04-26	06-15	08-03	09-20	12-14	06-15	08-03	09-20
ALKALINITY	MG/L	270	274	277	274	273	271	272	277	272	271	290	286	312	288
AMMONIA AS N	MG/L	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008	<J0.008
ARSENIC	UG/L	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7
BORON	MG/L	<J0.02	0.07	0.0576	<J0.02	<J0.02	0.0808	0.1	0.0887	0.0853	0.0744	<J0.02	<J0.02	<J0.02	<J0.02
CALCIUM	MG/L	99.2	89.8	88.4	90.9	94.9	98.2	89.1	93.3	92.3	94.6	100	95.4	94.1	96.6
CHLORIDE	MG/L	25.5	26.9	24.3	26.5	25.3	42.2	43.2	43.5	48.1	48.3	18.4	19.1	21.7	20.8
CHROMIUM	UG/L	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7
CONDUCTIVITY	uS/cm	640.3	655.8	655	648.6	663	713.1	.	746	738.4	755	646.9	669	654.4	654
COPPER	UG/L	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7	<J0.7
DO	MG/L	6.51	6.17	6.27	6.19	6.66	6.4	.	5.86	5.78	5.57	7.8	7.29	7.81	7.2
E COLI	MPN/dL	17.5	3.06	3.06	<J1	11	4.13	2.02	5.21	1	10.7	3.06	<J1	2.02	2.02
FLUORIDE	MG/L	0.144	0.133	0.167	0.182	0.188	0.165	0.163	0.183	0.217	0.236	0.145	0.16	0.19	0.195
IRON	MG/L	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02	<J0.02
LEAD	UG/L	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4	<J0.4
MAGNESIUM	MG/L	22.2	20.8	20.3	22.2	21.2	24.5	22.9	23.4	24.4	23.3	23.8	23.7	24	23.4
NICKEL	UG/L	2.12	<J0.7	<J0.7	<J0.7	<J0.7	1.95	<J0.7	<J0.7	<J0.7	<J0.7	2.06	<J0.7	<J0.7	<J0.7
NO3/NO2 AS N	MG/L	1.11	1.15	1.03	1.19	1.67	1.21	1.2	1.27	1.61	1.78	1.97	2.19	2	2.36
ORG. CARBON	MG/L	0.568	0.579	<J0.2	0.607	0.55	0.515	0.5	<J0.2	0.555	0.535	<J0.2	<J0.2	<J0.2	<J0.2
ORTHOP. AS P	MG/L	<J0.004	<J0.004	<J0.004	<J0.004	<J0.004	<J0.004	<J0.004	<J0.004	0.0191	<J0.004	<J0.004	<J0.004	<J0.004	0.0105
PH	Std Unit	7.07	7.1	7.02	7	6.97	7.08	.	7	7.01	7.01	7.04	7.05	7	7.11
POTASSIUM	MG/L	1.38	1.28	0.566	1.19	1.29	1.65	1.53	0.877	1.5	1.58	1.25	0.65	1.13	1.18
SODIUM	MG/L	17.4	15.7	14.7	14.5	15.1	28.7	26.4	28.2	28	30.1	11.7	11.9	11.5	11.7
STRONTIUM	UG/L	791	.	776	895	778	924	.	1080	980	870	403	467	499	402
SULFATE	MG/L	36.1	34	32.1	31.2	31.8	46.5	45.4	45.2	45.2	47	27.5	28.4	29.8	26.2
TSS	MG/L	<J1	1.6	<J1	<J1	1	<J1	1.4	1.1	<J1	<J1	1.8	1.5	1.1	1.6
WATER TEMP.	Deg C	20.82	21.13	21.61	21.41	21.83	21.08	.	21.4	21.4	21.62	21.61	21.69	21.75	21.74
ZINC	UG/L	<J1.7	<J1.7	<J1.7	<J1.7	<J1.7	<J1.7	<J1.7	5.4	<J1.7	<J1.7	<J1.7	<J1.7	<J1.7	<J1.7

Barton Springs and Associate Springs – Semi-annual and Annual Monitoring Expanded analytes at Eliza and Old Mill Springs in FY2017. Samples collected on April 26, 2017.

PARAMETER	UNIT	Eliza Spring	Old Mill Spring
1_1_1-TRICHLOROETHANE	UG/L	<J2	<J2
1_1_2_2-TETRACHLOROETHANE	UG/L	<J2	<J2
1_1_2-TRICHLOROETHANE	UG/L	<J2	<J2
1_1-DICHLOROETHANE	UG/L	<J2	<J2
1_1-DICHLOROETHYLENE	UG/L	<J2	<J2
1_2_3-TRICHLOROBENZENE	UG/L	<J2	<J2
1_2_3-TRICHLOROPROPANE	UG/L	<J2	<J2
1_2_4_5-TETRACHLOROBENZENE	UG/L	<J3.97	<J3.91
1_2_4-TRICHLOROBENZENE	UG/L	<J1.98	<J1.96
1_2-DIBROMO-3-CHLOROPROPANE	UG/L	<J2	<J2
1_2-DIBROMOETHANE	UG/L	<J2	<J2
1_2-DICHLOROBENZENE	UG/L	<J1.98	<J1.96
1_2-DICHLOROETHANE	UG/L	<J2	<J2
1_2-DICHLOROETHENE	UG/L	<10	<10
1_2-DICHLOROPROPANE	UG/L	<J2	<J2
1_2-DIPHENYLHYDRAZINE	UG/L	<J1.98	<J1.96
1_3-DICHLOROBENZENE	UG/L	<J1.98	<J1.96
1_3-DICHLOROPROPENE	UG/L	<10	<10
1_4-DICHLOROBENZENE	UG/L	<J1.98	<J1.96
1+2-CHLORONAPHTHALENE	UG/L	<J3.97	<J3.91
1-NAPHTHYLAMINE	UG/L	<J3.97	<J3.91
2_3_4_6-TETRACHLOROPHENOL	UG/L	<J1.98	<J1.96
2_4_5-TP (SILVEX)	UG/L	<J0.198	<J0.19
2_4_5-TRICHLOROPHENOL	UG/L	<J1.98	<J1.96
2_4_5-TRICHLOROPHENOXYACETIC ACID	UG/L	<J0.198	<J0.19
2_4_6-TRICHLOROPHENOL	UG/L	<J1.98	<J1.96
2_4-DICHLOROPHENOL	UG/L	<J1.98	<J1.96
2_4-DICHLOROPHENOXYACETIC ACID	UG/L	<J0.198	<J0.19
2_4-DIMETHYLPHENOL	UG/L	<J1.98	<J1.96
2_4-DINITROPHENOL	UG/L	<J19.8	<J19.6
2_4-DINITROTOLUENE	UG/L	<J3.97	<J3.91
2_6-DICHLOROPHENOL	UG/L	<J1.98	<J1.96
2_6-DINITROTOLUENE	UG/L	<J1.98	<J1.96
2-CHLOROETHYL VINYL ETHER	UG/L	<J2	<J2
2-CHLOROPHENOL	UG/L	<J1.98	<J1.96
2-HEXANONE (BUTYLMETHYLKETONE)	UG/L	<J2	<J2
2-METHYLNAPHTHALENE	UG/L	<J1.98	<J1.96
2-METHYLPHENOL (O-CRESOL)	UG/L	<J1.98	<J1.96
2-NAPHTHYLAMINE	UG/L	<J1.98	<J1.96
2-NITROANILINE	UG/L	<J1.98	<J1.96
2-NITROPHENOL	UG/L	<J1.98	<J1.96
2-PICOLINE (2-METHYLPYRIDINE)	UG/L	<J1.98	<J1.96
3_3'-DICHLOROBENZIDINE	UG/L	<J1.98	<J1.96
3-METHYLCHOLANTHRENE	UG/L	<J1.98	<J1.96
3-NITROANILINE	UG/L	<J1.98	<J1.96
4_6-DINITRO-2-METHYLPHENOL	UG/L	<J19.8	<J19.6

PARAMETER	UNIT	Eliza Spring	Old Mill Spring
4-AMINOBIPHENYL	UG/L	<J1.98	<J1.96
4-BROMOPHENYL PHENYL ETHER	UG/L	<J1.98	<J1.96
4-CHLORO-3-METHYLPHENOL	UG/L	<J1.98	<J1.96
4-CHLOROANILINE	UG/L	<J1.98	<J1.96
4-CHLOROPHENYL PHENYL ETHER	UG/L	<J1.98	<J1.96
4-METHYL-2-PENTANONE (HEXANONE)	UG/L	<J2	<J2
4-NITROANILINE	UG/L	<J3.97	<J3.91
4-NITROPHENOL	UG/L	<J3.97	<J3.91
7_12-DIMETHYLBENZO(A)ANTHRACENE	UG/L	<J1.98	<J1.96
ACENAPHTHENE	UG/L	<J1.98	<J1.96
ACENAPHTHYLENE	UG/L	<J1.98	<J1.96
ACETONE	UG/L	<J2	<J2
ACETOPHENONE	UG/L	<J1.98	<J1.96
ACROLEIN	UG/L	<J2	<J2
ACRYLONITRILE	UG/L	<J2	<J2
ANILINE	UG/L	<J1.98	<J1.96
ANTHRACENE	UG/L	<J1.98	<J1.96
ATRAZINE (AATREX)	UG/L	<J1.98	<J1.96
AZINPHOS METHYL (GUTHION)	UG/L	<J0.2	<J0.2
BENZENE	UG/L	<J2	<J2
BENZIDINE	UG/L	<J1.98	<J1.96
BENZO(A)ANTHRACENE	UG/L	<J1.98	<J1.96
BENZO(A)PYRENE	UG/L	<J1.98	<J1.96
BENZO(B)FLUORANTHENE	UG/L	<J1.98	<J1.96
BENZO(GHI)PERYLENE	UG/L	<J1.98	<J1.96
BENZO(K)FLUORANTHENE	UG/L	<J1.98	<J1.96
BENZOIC ACID	UG/L	<J19.8	<J19.6
BENZYL ALCOHOL	UG/L	<J4.96	<J4.89
BIS(2-CHLOROETHOXY)METHANE	UG/L	<J1.98	<J1.96
BIS(2-CHLOROETHYL)ETHER	UG/L	<J1.98	<J1.96
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	<J1.98	<J1.96
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<J1.98	<J1.96
BROMACIL	UG/L	<J0.209	<J0.198
BROMODICHLOROMETHANE	UG/L	<J2	<J2
BROMOFORM	UG/L	<J2	<J2
BUTYL BENZYL PHTHALATE	UG/L	<J1.98	<J1.96
CADMIUM	MG/L	<J0.0004	<J0.0004
CARBARYL (SEVIN)	UG/L	<J1.98	<J1.96
CARBAZOLE	UG/L	<J1.98	<J1.96
CARBON DISULFIDE	UG/L	<J2	<J2
CARBON TETRACHLORIDE	UG/L	<J2	<J2
CHLOROBENZENE	UG/L	<J2	<J2
CHLOROETHANE	UG/L	<J2	<J2
CHLOROFORM	UG/L	<J2	<J2
CHLORPYRIFOS (DURSBAN)	UG/L	<J0.2	<J0.2
CHRYSENE	UG/L	<J1.98	<J1.96
CIS-1_2-DICHLOROETHENE	UG/L	<J2	<J2
CIS-1_3-DICHLOROPROPENE	UG/L	<J2	<J2
DALAPON	UG/L	<J0.198	<J0.19
DEMETON	UG/L	<J0.5	<J0.5

PARAMETER	UNIT	Eliza Spring	Old Mill Spring
DEMETON-O	UG/L	<J0.2	<J0.2
DEMETON-S	UG/L	<J0.2	<J0.2
DIAZINON	UG/L	<J0.2	<J0.2
DIBENZ(AH)ANTHRACENE	UG/L	<J1.98	<J1.96
DIBENZO(AJ)ACRIDINE	UG/L	<J1.98	<J1.96
DIBENZOFURAN	UG/L	<J1.98	<J1.96
DIBROMOCHLOROMETHANE	UG/L	<J2	<J2
DIBROMOMETHANE	UG/L	<J2	<J2
DICAMBA (BANVEL)	UG/L	<J0.198	<J0.19
DICHLORODIFLUOROMETHANE	UG/L	<J2	<J2
DIETHYL PHTHALATE	UG/L	<J1.98	<J1.96
DIMETHYL PHTHALATE	UG/L	<J1.98	<J1.96
DI-N-BUTYL PHTHALATE	UG/L	<J1.98	<J1.96
DI-N-OCTYL PHTHALATE	UG/L	<J1.98	<J1.96
DINOSEB	UG/L	<J0.198	<J0.19
ETHYL METHACRYLATE	UG/L	<J2	<J2
ETHYLBENZENE	UG/L	<J2	<J2
ETHYLMETHANE SULFONATE	UG/L	<J1.98	<J1.96
FLUORANTHENE	UG/L	<J1.98	<J1.96
FLUORENE (9H-FLUORENE)	UG/L	<J1.98	<J1.96
HEXACHLOROBENZENE (HCB)	UG/L	<J1.98	<J1.96
HEXACHLOROBUTADIENE	UG/L	<J1.98	<J1.96
HEXACHLOROCYCLOPENTADIENE	UG/L	<J3.97	<J3.91
HEXACHLOROETHANE	UG/L	<J1.98	<J1.96
INDENO(1_2_3-CD)PYRENE	UG/L	<J1.98	<J1.96
IODOMETHANE	UG/L	<J2	<J2
ISOPHORONE	UG/L	<J1.98	<J1.96
M+P(META+PARA)XYLENE	UG/L	<J4	<J4
MALATHION	UG/L	<J0.2	<J0.2
MERCURY	UG/L	<J0.07	<J0.07
METHYL BROMIDE (BROMOMETHANE)	UG/L	<J2	<J2
METHYL CHLORIDE (CHLOROMETHANE)	UG/L	<J2	<J2
METHYL ETHYL KETONE (2-BUTANONE)	UG/L	<J5	<J5
METHYL METHANE SULFONATE	UG/L	<J1.98	<J1.96
METHYL PARATHION	UG/L	<J0.2	<J0.2
METHYL TERT-BUTYL ETHER (MTBE)	UG/L	<J2	<J2
METHYLENE CHLORIDE	UG/L	<J2	<J2
MP-CRESOL	UG/L	<J3.97	<J3.91
NAPHTHALENE	UG/L	<J1.98	<J1.96
NITROBENZENE	UG/L	<J1.98	<J1.96
N-NITROSODIETHYLAMINE	UG/L	<J3.97	<J3.91
N-NITROSODIMETHYLAMINE	UG/L	<J1.98	<J1.96
N-NITROSO-DI-N-BUTYLAMINE	UG/L	<J1.98	<J1.96
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<J1.98	<J1.96
N-NITROSODIPHENYLAMINE	UG/L	<J1.98	<J1.96
N-NITROSOPIPERIDINE	UG/L	<J1.98	<J1.96
OIL AND GREASE	MG/L	<J2.5	<J2.5
O-XYLENE	UG/L	<J2	<J2
PARATHION (PARATHION ETHYL)	UG/L	<J0.2	<J0.2
P-DIMETHYLAMINOAZOBENZENE	UG/L	<J3.97	<J3.91

PARAMETER	UNIT	Eliza Spring	Old Mill Spring
PENTACHLOROBENZENE	UG/L	<J1.98	<J1.96
PENTACHLORONITROBENZENE	UG/L	<J1.98	<J1.96
PENTACHLOROPHENOL	UG/L	<J0.198	<J0.19
PETROLEUM HYDROCARBONS >C12-C28	MG/L	<J2.01	<J1.94
PETROLEUM HYDROCARBONS >C28-C35	MG/L	<J2.01	<J1.94
PETROLEUM HYDROCARBONS C6-C12	MG/L	<J2.01	<J1.94
PETROLEUM HYDROCARBONS C6-C35	MG/L	<1.94	<1.94
PHENACETIN	UG/L	<J1.98	<J1.96
PHENANTHRENE	UG/L	<J1.98	<J1.96
PHENOL	UG/L	<J1.98	<J1.96
PICLORAM	UG/L	<J0.198	<J0.19
PRONAMIDE (KERB)	UG/L	<J1.98	<J1.96
PYRENE	UG/L	<J1.98	<J1.96
PYRIDINE	UG/L	<J1.98	<J1.96
SILVER	MG/L	<J0.0004	<J0.0004
STYRENE	UG/L	<J2	<J2
TETRACHLOROETHYLENE (TETRACHLOROETHENE)	UG/L	<J2	<J2
TOLUENE	UG/L	<J2	<J2
TOTAL CRESOLS	UG/L	<J3.97	<J3.91
TRANS-1_2-DICHLOROETHENE	UG/L	<J2	<J2
TRANS-1_3-DICHLOROPROPENE	UG/L	<J2	<J2
TRANS-1_4-DICHLORO-2-BUTENE	UG/L	<J2	<J2
TRICHLOROETHYLENE (TCE)	UG/L	<J2	<J2
TRICHLOROFLUOROMETHANE	UG/L	<J2	<J2
VINYL ACETATE	UG/L	<J2	<J2
VINYL CHLORIDE	UG/L	<J2	<J2
VOLATILE SUSPENDED SOLIDS	MG/L	<J1	<J1
XYLENES	UG/L	<J5	<J5

Appendix G

Dry Weather Field Investigations

Dry Weather Field Investigations

- Waller Creek
    - *Outfall ID 87393*: 42" circular pipe upstream of West 51st St. At the time of screening the flow rate was approximately 3 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were >2419.6 mpn. This outfall is a known source of bacteria and has placed on a watch list to be re-evaluated in 2018 by SWT staff.
    - *Outfall ID 70167*: 42" circular pipe on the University of Texas campus at the corner of Deloss Dodds Way and San Jacinto Blvd. At the time of screening the flow rate was approximately 8 gpm, structural condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.25 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 201.4 mpn. SCRP staff investigated the discharge and discovered the flow originating from a parking garage sump pump that was combined with municipal water from irrigation. No corrective action was initiated.
    - *Outfall ID 203700*: 48" circular pipe on the University of Texas campus along San Jacinto Blvd. At the time of screening the flow rate was approximately 15 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 61.3 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.
    - *Outfall ID 780535*: 54" circular pipe downstream of East 32nd St. At the time of screening the flow rate was approximately 2 gpm, structural condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.20 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 20.3 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.

- *Outfall ID 86358*: 48” circular pipe downstream of Duval St. At the time of screening the flow rate was approximately 2 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 23.1 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.

- Shoal Creek
  - *Outfall ID 86569:* 54” circular pipe upstream of Northland Dr. At the time of screening the flow rate was approximately 7 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry found 0.25 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 298.7 mpn. SCRP staff investigated the discharge and discovered the cause of the flow to be municipal water from irrigation activities in the area. No corrective action was initiated.
  - *Outfall ID 87484:* 84” box culvert along north bound MOPAC access road and downstream of West Breaker Ln. At the time of screening the flow rate was approximately 15 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 42.0 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.
  - *Outfall ID 86883:* 36” circular pipe downstream of West 24th St. At the time of screening the flow rate was approximately 20 gpm, structural condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.01 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 50.4 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.
  - *Outfall ID 573305:* 84” box culvert at the corner of West 34th St. and Shoal Creek Blvd. At the time of screening the flow rate was approximately 10 gpm, structural

condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia, chlorine had a value of 0.01 ppm, and temperature and pH were within range. E.coli results were >2419.6 mpn. This outfall has been placed on a watch list to be re-evaluated in 2018 by SWT staff.

- Williamson Creek
    - *Outfall ID 214827*: 48”X36” box culvert on Scenic Brook Tributary to Williamson Creek between Scenic Brook Dr. and South Brook Dr. At the time of screening the flow rate was approximately 2 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 261.3 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.
    - *Outfall 708240*: 36” circular pipe on Motorola Branch of Williamson Creek downstream of Terravista Dr. At the time of screening the flow rate was approximately 7 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 235.9 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.
- Boggy Creek
    - *Outfall ID 86771*: 36”X72” box culvert downstream of Airport Blvd. At the time of screening the flow rate was approximately 15 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 29.5 mpn. No follow-up investigations were initiated. We believe the flow is groundwater seepage from the recent rains of hurricane Harvey.
- Carson Creek
    - *Outfall ID 375368*: 84”X56” box culvert downstream of East Ben White Blvd. At the time of screening the flow rate was approximately 2 gpm, structural condition

was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.25 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 58.3 mpn. SCRP staff investigated the discharge and discovered no dry weather flow at the time of investigation.

- Tannehill Creek
    - *Outfall ID 246492*: 108"X60" box culvert on Givens Park One tributary of Tannehill Creek downstream of Tom Miller St. At the time of screening the flow rate was approximately 2 gpm, structural condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.25 ppm of ammonia, 0.10 ppm of chlorine while temperature and pH were within range. E.coli results were 307.6 mpn. SCRP staff investigated the discharge and discovered no dry weather flow at the time of investigation.
- Fort Branch
    - *Outfall ID 480032*: 42" circular pipe upstream of Webberville Rd. At the time of screening the flow rate was approximately 5 gpm, structural condition was normal, no odor, clarity was clear, no floatable or vegetation. Water chemistry was negative for ammonia and chlorine and temperature and pH were within range. E.coli results were 488.4 mpn. The E.coli level, while elevated, was not enough to trigger an immediate follow-up. The outfall has been added to the Austin Youth River Watch volunteer monitoring list for 2018.
- Marble Creek
    - *Outfall ID 148573*: 42" circular pipe at the upstream corner of Colton Bluff Springs Rd. and Alum Rock Dr. At the time of screening the flow rate was approximately 1.5 gpm, structural condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.25 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 222.4 mpn. SCRP staff investigated the discharge and discovered no dry weather flow at time of the investigation.
- Town Lake (Ladybird Lake)
    - *Outfall ID 103154*: 78" circular pipe north bank underneath Congress Ave Bridge. At the time of screening the flow rate was approximately 10 gpm, structural

condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.50 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were >2419.6 mpn. SCRP and SWT staff investigated the outfall and found no evidence of leaking infrastructure. This outfall drains most of downtown Austin along Congress Ave. and is believed the indigent community is a major source of fecal contamination in this area. It is common practice for businesses to power wash alley ways afterhours and the runoff is directed to this outfall. No further action is planned at this time.

- Lake Creek
    - *Outfall ID 149207*: 52" circular pipe downstream of Lake Creek Pkwy. At the time of screening the flow rate was approximately 30 gpm, structural condition was normal, no odor, clarity was clear, no floatables or vegetation. Water chemistry found 0.25 ppm of ammonia, no chlorine and temperature and pH were within range. E.coli results were 157.6 mpn. SCRP staff investigated the discharge and discovered the flow originating from AC condensate from commercial and multi-family residences in the area combined with municipal water from irrigation activities. No corrective action was initiated.