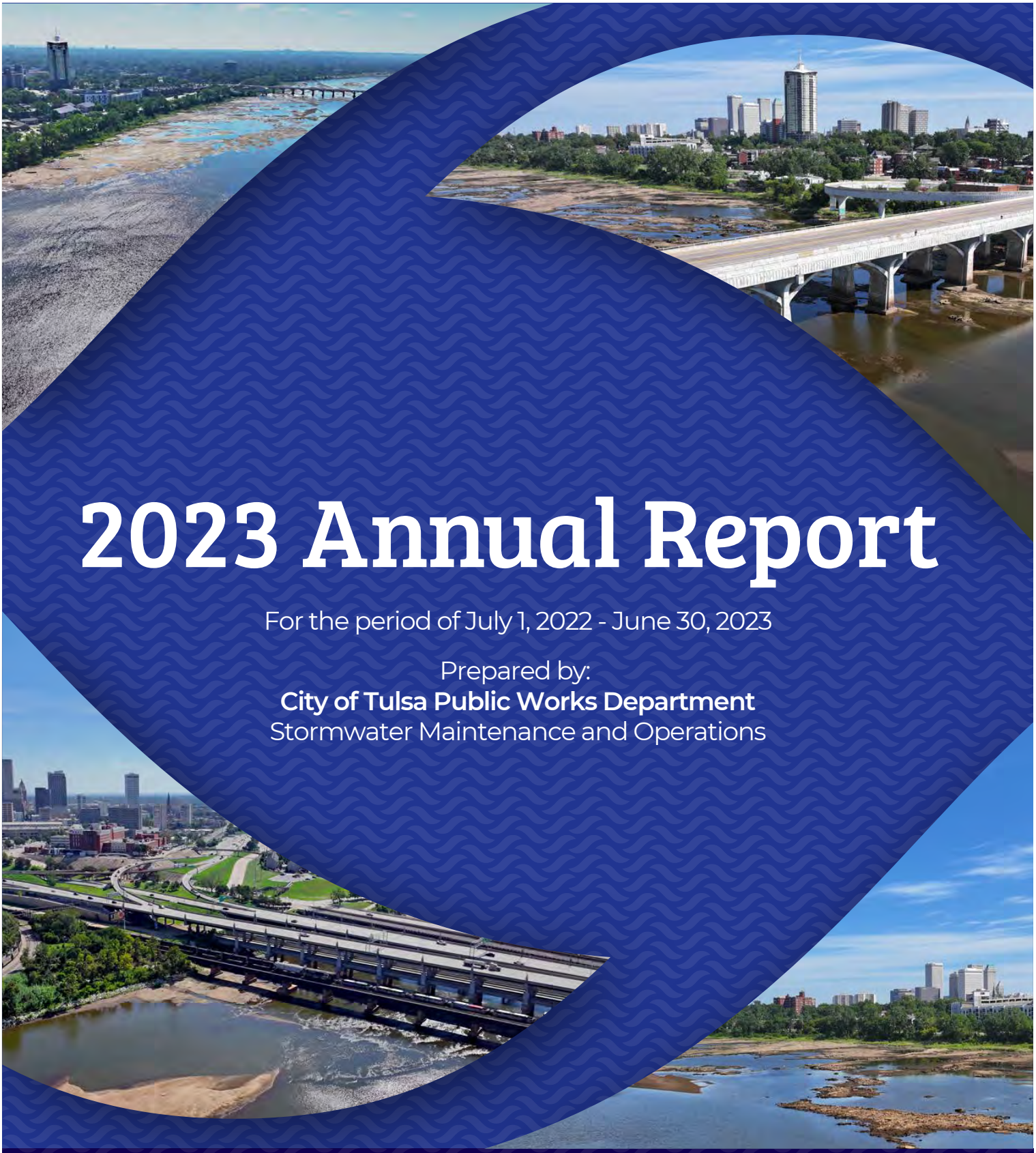

2023 Annual Report

For the period of July 1, 2022 - June 30, 2023

Prepared by:
City of Tulsa Public Works Department
Stormwater Maintenance and Operations

Save Our Streams

CITY OF Tulsa
A New Kind of Energy

Annual Report

OPDES Stormwater Permit #OKS000201

July 1, 2022 to June 30, 2023

Co-Permittees:

Oklahoma Turnpike Authority

Oklahoma Department of Transportation

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OPDES Permit No. OKS000201
Review of Stormwater Annual
Report

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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information 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 of violations.

Roy N. Teeters
Manager
Stormwater Maintenance and Operations
Division

10·11·23
Date

Section 1
The Status of Implementing the Stormwater Management Program (SWMP)

The Stormwater Management Program (SWMP) of the City of Tulsa's municipal stormwater discharge permit #OKS000201, Part II, consists of 12 separate programs. A brief review of each of the individual programs and tasks performed during the period of July 1, 2022 through June 30, 2023, will result in the effective assessment of permit compliance.

Part II(A)(1) Structural Controls and Stormwater Collection System Operation

Status: Compliant and Ongoing

The City of Tulsa's SWMP provides for the maintenance of both above and below ground structural stormwater controls including detention ponds, inlets, conduits and channels. The primary purpose of this program is to assure proper operation of these structural controls for better control of stormwater quantity. Additionally, stormwater quality benefited from the removal of sediment, floatables, and regular inspections of all structures. The following table is an inventory of the work performed on these structures during this reporting period.

Maintenance of Above Ground Stormwater Structural Controls

ABOVE GROUND STRUCTURE(S)	INVENTORY (FOR REPORTING PERIOD)	OPERATIONS & MAINTENANCE (O&M) ACTIVITY	O&M ACTIVITY (COMPLETED EACH REPORTING PERIOD)
Channels/ Streams/ Detention Ponds	1,636 acres	Mowing	13 x/year of mowable property (totaling 19,632 acres)
Channels & Streams/ Detention Ponds	2,336 acres	Weed control (Herbicide)	All parcels 1 x/year for broad leaf weed control (totaling 2,336 acres)
Channels & Streams (Hydro Mulch Plus)	445 acres	Weed Control (Herbicide)	All parcels 6 x/year for growth control (totaling 2,674 acres)
Channels & Streams (Inhouse)	282 acres	Weed Control (Herbicide)	All parcels 4 x/year for growth control (totaling 1,128 acres)
Wet Ponds	67 acres	Algae Control	All ponds 4 x/year for growth control (totaling 266 acres)
Channels/ Streams/ Detention Ponds	3,999 acres	Cleaning/ Sediment Removal (Ponds/Streams)	31,888 cubic yards/period
Roadside Ditches	970 miles	Sediment Removal (Roadside Ditching)	28,858 linear feet/period

Maintenance of Below Ground Stormwater Structural Controls

BELOW GROUND STRUCTURE(S)	INVENTORY (FOR REPORTING PERIOD)	OPERATIONS & MAINTENANCE (O&M) ACTIVITY	O&M ACTIVITY (COMPLETED EACH REPORTING PERIOD)
Storm Sewer Pipe (all pipe - driveway pipe, crossover pipe, etc…)	1,322 miles	Inspect Flush/clean Repair or Replace	13.9 miles/period 27.1 miles/period 1,597 linear feet units/period
Catch Basin/Inlets	42,602 units	Inspect & Clean Repair	2,386 units/period 125 units/period
Pump Station	14 units	Clean interior, Inspect & Maintain	680 maintenance activities

Additionally, prior to mowing of all stormwater control structures, all trash was collected and disposed of properly. Detention ponds that are multi-use had trash cans for disposal of litter. These cans were emptied on a regular basis.

Compliance shall be based on completion of the O&M ACTIVITY column found in the charts.

Part II(A)(2) Areas of New Development and Significant Redevelopment

Status: Compliant and ongoing

This requirement was met through the continued implementation of the Stormwater Master Drainage Plan, Tulsa Stormwater Management Criteria Manual and ordinances (Title 11-A, Chapter 3, Watershed Development Regulations; Title 11-A, Chapter 5, Pollution; Title 42, Chapter 11, Planned Unit Development) that relate to any new development and significant re-development that occurs in Tulsa. These documents were created in order to reduce flooding due to new development and significant re-development. A secondary benefit was to reduce the impact on water quality as a result of construction. The City of Tulsa follows a city-wide Comprehensive Plan. This plan addresses all facets of activities including water quality and had undergone an update in 2016 with guidance from many groups, including Stormwater Quality and Engineering Services - Stormwater Design Section. The City of Tulsa also utilizes the Master Drainage plans specific to each basin. The Master Drainage plans are planning tools used to determine capital improvements to reduce flooding, providing solutions to storm water drainage, maintenance and management issues. These capital improvement projects are

prioritized based on benefits and costs. Master Drainage Plans are updated as funds become available.

Tulsa has developed stormwater master drainage plans (MDPs) for 31 watersheds that cover the entire city. The MDP's are used as planning tools to determine/regulate fully developed floodplains that extends beyond the typical FEMA floodplain. MDPs are also used as planning tools to develop capital improvement projects that will mitigate flooding problems in the basins. They identify and provide solutions to storm water drainage, maintenance and management issues. Projects are prioritized based on benefits and costs. These Master Drainage Plans are being updated as funds become available.

Tulsa continued to implement the "Tulsa Stormwater Criteria Manual". This manual, created and adopted in 1994, is a comprehensive manual designed to assist engineers, designers and construction operators in aspects of storm water runoff control before, during and after construction activities are completed. This includes both water quality and quantity. The Criteria Manual has several purposes including minimizing water quality degradation by preventing siltation and erosion of the City waterways and preserving environmental quality. This manual is utilized by the City of Tulsa staff, as well as site development engineers during the design and review phases of all new developments and significant redevelopment projects that occur within the City of Tulsa. Tulsa completed an update of this document to reflect more current policies and practices 2019. Additionally, the Watershed Development Regulations (Title 11-A, Ordinance # 16959) lists the current practices regarding regulation of new development and significant redevelopment for the control of storm water runoff.

Anyone planning to develop or redevelop areas of Tulsa has to follow a process with the Development Services Division of the City of Tulsa. This process requires developers to follow extensive planning, designing, and review. This ensures the area targeted for development meets all City requirements, including reducing the impact of flooding, impacts on city owned utilities, traffic needs, etc., after construction is completed.

The City of Tulsa had recently completed work on a major update of its zoning code. Including a separate rewrite of the Landscaping Chapter which was completed between March of 2017 and December 2018. A Stormwater Quality representative was involved in the working group and draft updates to ensure Low Impact development (LID) impediments are removed and LID is incentivized to the maximum extent practicable.

The Subdivision and Development Regulations has also undergone an update completed in May 2018. This effort was a recommended strategy from our Comprehensive Plan, PLANiTULSA, which was approved by City Council in 2010 and has recently begun another update. The guiding principles of this plan include a desire for Tulsa to become a

more environmentally and fiscally sustainable city. The City of Tulsa hired a contractor to perform tasks associated with the subdivision regulation update outlined in a Request for Proposals. Stormwater Quality staff had been actively involved in working group to remove barriers and encourage LID.

The City's Comprehensive Plan has again recently begun a review with input from Stormwater Quality. This document provides direction and goals for various elements of Tulsa's growth and development. Language was added that promoted the recreational use of waterways, maintaining high water quality, LID, and adding increased enforcement efforts to developments and erosion control.

As mentioned above, the Stormwater Design Criteria Manual is working to incorporate a revised Chapter 1100, now titled Low Impact Development. This Chapter simply references the Low Impact Development Design Manual which is complete, led by Dr. Jason Vogel at the University of Oklahoma. When this chapter is adopted, Tulsa will have taken a big step toward promoting and providing guidance on LID projects in Tulsa. The City of Tulsa also worked with Dr. Vogel on a LID Maintenance and Inspection Manual. This process began in early 2018 and should be completed and officially adopted in 2024. Workshops were held with regulators and developers to fine tune these documents and adoption by the City Council and further promotion will be done in coming years. Further promotion of LID was accomplished by implementation of the following:

- LID was promoted at 56 predevelopment meetings and other educational functions, particularly those with key personnel, including engineers and planners.
- Continuous review of Tulsa's development regulations to determine if they are LID friendly.
- Conducted public education events promoting LID, especially with developers/contractors.
- Developed "Guide to Low Impact Development" literature that is distributed at public events.

Stormwater Quality has adopted an already existing City Program to recognize Low Impact Development practices in Tulsa. The program, Partners for A Clean Environment (PACE) is a voluntary, non-regulatory recognition program coordinated by the City of Tulsa's Quality Assurance and Stormwater Quality groups. The focus of the program is to provide recognition to businesses, individuals and groups who go above and beyond environmental regulations in an effort to be better stewards of our land and water. Currently there are 19 members of this program, though more LID features have been implemented in Tulsa and time should be devoted in the future to promoting membership in this program. The Great Plains LID webpage shows a map that Stormwater Quality staff utilize to document LID in Tulsa. It currently has approximately 60 features with info such as address, brief description, and pictures to aid viewers.

Part II(A)(3) Roadways

Status: Compliant and ongoing

This requirement was met through the City's street sweeping and mowing activities performed and managed by the Public Works Department.

Through the utilization of private contractors, Public Works Department contractors swept arterial streets 12 times. Emphasis was placed on sweeping after de-icing material was no longer required as a result of a snow or ice event. Residential streets were swept 4 times. The program's progress is measured in curb miles swept and yds^3 of material removed. Arterial and residential mileage per year may vary due to weather variations as well as contractor issues from one year to the next. BMP's that prevent run-off from deicing material are in place at Tulsa's east and west maintenance yards. All of Tulsa's trucks washing facilities drain to the sanitary sewer, thus avoiding potential contamination in the storm sewer.

Street Sweeping

Type	Sweeping Requirement	Sweeping completed	O & M Activity (for reporting period)	Material Removed
Arterial	~8x annually	12	8,548 miles	5,579 yds^3
Residential	~4x annually	4	11,356 miles	35,812 yds^3

Contractors have reviewed the MS4 Permit and the Pollution Ordinance, in order to be familiar with the MS4 regulations and requirements, to prevent contamination of the

waters of the State. As contracts for sweeping, mowing, and road maintenance come up for renewal, language will be added to include a water quality requirement. This will require the contractor to review the SWMP, Pollution Ordinance and the MS4 permit.

During this reporting period, trash removal was also conducted on all street right-of-ways prior to any mowing. This program has faced a decline of participants for a variety of reasons including the pandemic and inmates being routed to other programs. Numbers for inmate work crews are as follows:

Litter Removal from Roadways

Collected by	Amount Collected	
Inmate work crews	634 bags	38 tons

The Tulsa Stadium Improvement District (TSID) is responsible for various litter cleaning activities in the Central Business District, of the downtown area of Tulsa. This area consists of 1.4 square miles containing 58.37 curb miles.

Central Business District

Type of Activity	Interval
134 trash cans (inspect/clean)	6x/week
12 Pet Waste Stations (refilled)	2x/week

Stormwater Quality continued to warn citizens and companies not to sweep or blow grass/leaves/debris into the street or storm sewer as it is a violation of Tulsa's Ordinance's and could result in a fine. In addition, literature was distributed titled "Landscaping BMP". This literature is given to anyone believed to be disposing of leaves and grass into the MS4 (Municipal Separate Storm Sewer System). It directs the alleged disposer against further disposal of this material into the MS4.

Permit compliance was achieved with the completion of the specified street sweeping and litter removal.

Part II(A)(4) Flood Control Projects

Status: Compliant and ongoing

To address this program requirement, the City of Tulsa has continued to implement the following activities:

1. Flood Management Project Design Review
2. Utilization of the NPDES Permit Evaluation Study – Water Quality Enhancement Assessment of Existing Flood Control Detention Facilities, September 15, 1998.

A discussion of the procedures for each activity is presented below.

Flood Management Project Design Review

To ensure that proposed flood control projects assess the impacts on the water quality of receiving water bodies, the City has and will perform a project design review for all current and future major flood control projects. The project design review utilizes criteria derived from design considerations included in the Stormwater Design Criteria Manual.

By definition, the purpose of a flood control project is to reduce flood damage. Flood control and water quality management strategies differ greatly. Flood control projects are designed to manage stormwater runoff resulting from large, infrequent storm events. Normally, these projects are designed to quickly convey runoff resulting from up to a 100-year storm event. Conversely, water quality management facilities are designed to handle runoff from much smaller, more frequent storm events (1-2 year storm event). In a given year, 70-90 percent of all runoff (and generally the associated pollutants) typically result from storm events producing less than 2 inches of rainfall. Water quality management facilities attempt to slow stormwater runoff, maximizing hydraulic detention periods to facilitate sedimentation and biological uptake. Therefore, this program element does not attempt to provide comprehensive water quality management utilizing "flood control" structures. The goal is to assure that project impacts to receiving waters are assessed and minimized through the use of sound engineering design principles. Where possible, water quality treatment principles will be incorporated into the design of flood control projects.

Sections 700 and 900 of the City of Tulsa Stormwater Design Criteria Manual document minimum design criteria. These criteria address the following design considerations:

- Channel Design
  - -Maximum velocity
  - -Channel geometry, side slopes
  - -Channel material/stabilization
  - -Side slope vegetation

Additional City review will take into consideration:

- Detention Structure Design
  - -Storage volume to maximize residence time
  - -Outflow structure design to slowly release detained flows without causing flooding
  - -Energy Dissipaters to slow velocity

- Location
  - -Downstream effects
  - -Existing receiving water quality
  - -Maintainability
  - -Proximity in the watershed with respect to impervious areas

Existing Flood Control Structure Evaluation - NPDES Permit Evaluation Study

In September 1998, Tulsa evaluated the feasibility of retrofitting 19 existing flood control structures to provide additional pollutant removal. This study recommended using upper watershed BMP's or control of pollutants at the source rather than retrofitting existing flood control structures. This is currently addressed through the implementation of a number of stormwater management programs. This includes street sweeping, construction site erosion control and public education. These programs will continue to be utilized.

The City of Tulsa has guidelines for development in the upper 1/3 of drainage basins to have detention. These detention ponds help slow the rate of stormwater runoff as well as improve the quality of runoff by allowing pollutants to settle out.

Compliance will be based upon the assessment of the impact(s) to receiving water quality during the design phase of flood control project. Where possible, water quality treatment principles will be incorporated into the design of these projects.

Part II(A)(5) Pesticide, Herbicide, and Fertilizer Application

Status: Compliant and ongoing

All City of Tulsa personnel, as well as all contract applicators that applied pesticides and herbicides were required to be licensed and subject to all regulations under the Oklahoma Pesticide Applicators Law, including re-certification. City personnel that applied

pesticides, herbicides and fertilizers received annual in-house training on specific types of pesticides, herbicides and fertilizers. All Stormwater Maintenance and Parks employee license records are available upon request. See below for trainings attended. Parks Department herbicide applicators records available at 4508 E. Mohawk Blvd upon request.

March 2023 – OKVMA Conference
October 5 – 6, 2022 – OKVMA Conference
November 15, 2022 77th Annual Oklahoma Turfgrass Conference
Virtual OTRF Nov 17, 2020---Winfield Academy 11.11, 2022

With the issuance of the Environmental Protection Agency's (EPA) (now Oklahoma Department of Agriculture Food and Forestry's) Pesticide General Permit in October 2011 and recently renewed in 2023, the City of Tulsa was required to formulate a Pesticide Discharge Management Plan (PDMP) as per the "Weed and Algae Control" category. The primary purpose of the PDMP is to protect water quality from abuse and misuse of pesticides. The City of Tulsa is compliant with all requirements of the PDMP and will continue to remain vigilant in their protection of waterways from pesticide misuse.

The Master Gardeners Program, available through the Oklahoma State University (OSU) Cooperative Extension Service, is a free service that offers expert advice to the public on all aspects of gardening, including the proper application of pesticides, herbicides and fertilizers as well as other gardening and lawn care tips and information. This service is available to the public either by visiting the extension services at 4116 East 15th, accessing the website www.tulsamastergardeners.org/ or utilizing the telephone hotline at (918) 746-3701. The Tulsa Master Gardeners answers approximately 100,000 garden related questions annually and they also conduct 2,500 soil tests annually, to assist homeowners in applying the proper type and amount of nutrients to their properties.

These questions are answered by volunteers trained in various horticultural issues including proper application of pesticides, herbicides and fertilizers. This program also distributes "Fact Sheets", which discuss choice of chemicals and application rates for most of the common uses of pesticides and fertilizers in urban areas. Gardening education is further accomplished by various media outlets including TV, radio, print, and online newsletters. This is also accomplished by numerous Home and Garden Shows throughout the year. The Master Gardener Program was also promoted through distribution of the "City Life" newsletter in the month of July 2022 and January 2023. Other information was promoted in City Life newsletter

this year on similar topics related to homeowners pesticide/herbicide use through a new program by the Oklahoma Conservation Commission titled Yard by Yard. The City of Tulsa further promoted the Master Gardeners Program through the distribution of brochures and on the City of Tulsa's stormwater quality website. See Attachment A for a list of brochures distributed.

In accordance with Part II(13)(5)(b) of Tulsa's current MS4 permit, in FY 14-15 and this FY also, Tulsa sent a letter to 296 pesticide applicators licensed by the Oklahoma Department of Food and Forestry to apply pesticides in Tulsa County. This letter contained information on the importance of proper application of pesticides, herbicides and fertilizers, instructions to not blow grass clippings and/or leaves into the street and advised applicators that non-compliance is a violation of the City of Tulsa's Pollution Ordinance, which could result in a fine.

Tulsa continued to maintain a website that is accessible to the public, which contains guidance for pesticide and fertilizer application for both commercial and residential applicators. This website is located at www.cityoftulsa.org/sos and is regularly promoted. The number of pageviews during this year was 5,926 which was slightly lower than previous years. Continued efforts are being made to drive citizens to the website for all manner of Stormwater Quality related info, videos, activities, etc…Including the topic pesticides.

See Part II(A)(10)(c) "Public Education" for additional public education on the proper use, storage and disposal of pesticides, herbicides and fertilizers by Tulsa during this period.

Part II(A)(6) Illicit Discharge and Improper Disposal

Status: Compliant and ongoing

The location and removal of illicit discharges and improper disposal continued to be an important aspect of the City of Tulsa's SWMP. Many departments within the City of Tulsa maintain various programs that involve locating and removing non-stormwater discharges to the storm sewer system and/or educating the public on proper disposal practices.

a.) Non-stormwater discharges

Tulsa allows the discharge of exempt non-stormwater discharges, as defined by 40 CFR 122.26(d)(2)(iv)(B)(1), to the storm sewer unless these discharges are determined to be contributing significant amounts of pollutants to the storm sewer. When an exempt non-stormwater discharge is found to be contributing significant amounts of pollutants to the storm sewer, enforcement action will be taken using Tulsa's Pollution Ordinance.

Other categories of allowable non-stormwater discharges to the MS4 are:

- Car Washing (non-commercial and charity)

- Swimming Pool / Hot Tub
- Outside Washing (pavement washing)

For the above discharges, Tulsa has established BMP's that must be implemented prior to allowing the discharge to the MS4. Failure to implement these measures may result in a violation of the Pollution Ordinance.

Discharges from emergency firefighting activities were monitored during all phases of Tulsa's firefighting activities for potential releases of pollutants. This was accomplished through the continued implementation of Tulsa's Fire Department (TFD) policies. These polices were implemented to ensure public health and safety and reduce the release of pollutants.

During this reporting period 266 investigations were conducted identifying 34 illicit discharges to the storm sewers. Tulsa's Pollution Ordinance was adopted November 1995 and continues to be utilized for the removal of non-stormwater discharges (see Section 6). This Ordinance allows the City of Tulsa to recover cleanup cost from the responsible party.

Additionally, the City of Tulsa achieves permit compliance by performing industrial stormwater inspections at City of Tulsa facilities. These inspections are performed to control pollutants that may be discharged into the MS4 system through routine operations and maintenance. These inspections focus on the proper storage of outdoor parts and materials, the condition of tanks and containers that store liquids and processes that may be conducted outdoors. Twenty-eight City facility inspections were also conducted during this time and are now compliant with Permit objectives. Additionally, scrutiny of Tulsa's municipal facilities was conducted this FY due to the April 2023 ODEQ audit where City and State employees visited multiple facilities and observed the routine inspection process.

Once an illicit discharge was identified, the responsible party was required to stop the discharge, redirect the discharge to the sanitary sewer or obtain an OPDES wastewater discharge permit from the Oklahoma Department of Environmental Quality (ODEQ). This was accomplished using the Pollution Ordinance.

Fliers titled, "Responsible Pet Ownership" and "Stormwater Quality Programs", were distributed at events and activities during this reporting period. These flyers educated the reader on the negative aspects of not collecting and disposing of pet waste properly. These programs were also promoted on the City of Tulsa's Stormwater Quality website.

The City of Tulsa co-sponsored the "Bark in the Park" theme night at the Tulsa Drillers baseball games. "Responsible Pet Ownership" flyers and pet waste bags as well as other promotional items were passed out to Tulsa area pet owners. The attendance increased this year, averaging around 4,500 per game. These games were good opportunities to interact with pet owners on responsible ways to clean up after their pet.

In an effort to control runoff from pet waste, Tulsa parks have a total of 30 pet waste signs. Pet stations provide pet waste disposal bags to properly dispose of pet waste in the trash. The stations are checked and refilled 1-2 times per month.

Public reporting of an illicit discharge or illegal disposal by concerned citizens (via the 311 call center or directly to the SMO Division), other City departments and government agencies (ODEQ or the EPA) are regularly promoted on the city's website or at educational events (see Attachment B). Multiple channels for reporting illicit discharges are a valuable part of the City's effort to locate illicit discharges and improper disposals. This year Stormwater Quality staff completed 266 service requests, 99 of these investigations were from the 311 call center.

Promotion of the proper disposal of leaves, grass and pet waste was accomplished through the utility bill stuffer in September, October, and November of 2022 and January, February, and March of 2023. A new flyer was also developed recently which describes and visually shows various types of pollution from homes, including pet waste.

Dry weather field screening and dry weather flow follow-up continue to be used, resulting in the location, identification and removal of illicit discharges and improper disposals that occurred during this reporting period (see Part II(A)(6)(e)) and Part II(A)(6)(f)).

One of the most common Dry Weather Field Screening causes of flow and follow-ups is from potable water discharges, commonly caused by water line leaks/breaks or flushing. Chlorinated water is a known stressor or toxin to aquatic life. Tulsa's Water and Sewer Department valves down water breaks in an attempt to reduce the amount of chlorinated water discharged to streams after breaks. They also use funding as available to reduce dead-end or low flow lines to reduce or eliminate the amount of water flushing needed to maintain drinking water standards in their lines.

Within the last few years, the Stormwater Quality group has been involved in the special event planning process. Information about the City of Tulsa's pollution ordinance and illicit discharges is provided in the Special Permit Event Application. Additionally, special events are regularly inspected by stormwater quality staff to ensure no violations are occurring. Last fiscal year the City of Tulsa processed approximately 270 special event permit applications.

b.) Sanitary sewer overflows

In a continuing effort to eliminate sanitary sewer overflows during this reporting period, the City initiated eight sanitary sewer manhole and/or pipeline rehabilitation projects. Four sanitary sewer evaluation studies were initiated and completed during this reporting period. No un-sewered area projects were completed during this reporting year. Excess wet weather flow to the sanitary sewer was diverted to seven flow equalization basins which reduce the amount of non-target rainwater from entering the sanitary sewer system.

The City of Tulsa's Working in Neighborhood's Department utilizes two programs that help eliminate sanitary sewer contamination of waterways. The Emergency Repair Grant consists of a $7,500 maximum grant to very low income residents to make emergency repairs to conditions that threaten the health and safety of the occupants. Areas of service include: electrical, plumbing, roofs, heating, and sewer lines. The Rehabilitation Loan Program is a $45,000 maximum rehabilitation loan available for moderate to very low income residents to assist citizens with home repairs, weatherization, and energy efficiency. Each residence is given a rigorous inspection to include lead based paint (LBP), electrical/mechanical/plumbing (EMP), structural, and interior repairs. Areas of service include: lead based paint, electrical, plumbing, security (doors and windows), roofs, heating, interior issues, weatherization, and sewer lines. Thirteen sewer lines were repaired/rehabilitated under these programs in the past fiscal year.

Sewer cleaning crews specifically targeted 106 miles of sewer lines known for grease accumulation problems. This maintenance program reduced the likelihood of sanitary sewer backups and overflows. Emergency cleaning of 42 miles of sanitary sewer was also conducted to remove grease and reduce sanitary sewer overflows. Additionally, in an effort to reduce grease blockages that result in sanitary sewer overflows, Tulsa continued its grease abatement program, better known as FOG (Fats, Oils, Grease) Best Management Practices Program, for the sanitary sewer. This voluntary program encourages restaurant owners to follow best management practices that ensure proper kitchen and grease management practices. Various meetings with business owners also facilitated discussion on the proper care and maintenance for trash receptacles, grease rendering bins, and parking lots.

As a result of the FOG BMP program the following actions took place during this reporting period:

Action	Results
Businesses Inspected	1,445
FOG Trainings Conducted	2 trainings 330 attendees
Businesses Participating in the FOG Program	492
Samples Obtained	4
Number of Enforcement Actions	4
Fines Issued	$525

Below is a breakdown of the advertising the FOG program conducted during this year:

Television Network	Frequency (# times aired)	Impressions (# views)
KOTV Channel 6	46	267,520
KJRH Channel 2	23	28,880
KTUL Channel 8	14	28,120
KOKI Channel 23	89	358,720
KQCW Channel 19	22	76,760

In addition to television, the FOG program ran radio advertisements 168 times over four weeks and reached 38.5% at an average frequency of 4.4%. The targeted audience was women between the age of 25-54.

Radio Schedule Highlights

KBEZ	24 Commercials
KHTT	24 Commercials
KIZS	24 Commercials
KJMM	24 Commercials
KJSR	36 Commercials
KRAV	48 Commercials
KRMG	12 Commercials
KTBT	24 Commercials
KTGX	24 Commercials
KTSB	24 Commercials
KWEN	48 Commercials
KXOJ	24 Commercials

The outdoor billboard campaign targeting radius is located near six key overflow locations in the City of Tulsa.

- N. Harvard, between Pine and Apache
- Admiral and Sheridan
- Mingo and 11th Street
- Mingo/Garnett and 31st
- Sheridan and 45th
- 71st and Sheridan

The billboard advertisement weekly total impressions were 605,426.

The overall campaign for the Trap the Grease Program:

- Broadcast TV: 760,000
- Radio: 45,864
- OTT: 111,111
- Outdoor: 605,426
- Total Imp: 1.52 million

The FOG program increases residential educational activities during the holiday months to prevent residential grease blockages due to holiday cooking activities. This year these activities included training at two different locations that had an attendance number of

330 participants. Also, a fryer oil collection event was held which collected 190 gallons of fryer oil for proper disposal from 40 participants. FOG booths were set up at community events and had approximately 10,750 visitors to the booths.

Tulsa continued efforts to reduce sanitary sewer overflows into storm sewer through the use of TV inspection and smoke testing techniques. Work completed during the reporting period included:

64 miles of sanitary sewer TV inspected
134 sanitary manholes raised to grade
234 main line sanitary sewer repairs
21,445 feet of main line sanitary sewer replaced or rehabilitated

In addition to investigating the private sewer defects located through smoke testing, the smokie inspector program also investigates private businesses that have a history of sewer defects. These businesses include apartment complexes, nursing homes and assisted living apartments, mobile home and RV parks, office complexes, motels, hotels, hospitals, schools, and shopping centers. The following statistics are from some of these sources. For the fiscal year 2022 – 2023, the smokie inspectors investigated and closed 5,980 cases. Of these cases, 372 were closed by cleanout repairs made by the inspectors.

These repairs reduced stormwater inflow to the sanitary sewer, which in turn reduced sanitary sewer overflows and illicit discharges to the stormwater sewer. Permit compliance was achieved through implementation of these programs.
The number of sanitary sewer overflows during this time was 71. This is 36% decrease from the prior year and less than the long-term average of approximately 230 SSO's per year. Sewer Operations and Maintenance Key Performance Indicator is less than 10 overflows per 100 miles of sewer per year, or 199 overflows (1,990 miles of sewer).

c.) Floatables

Reducing floatables (litter) is an important aspect of Tulsa's SWMP. Numerous organizations and COT departments maintain several programs to remove and prevent litter from various areas of Tulsa, including the storm sewer.

The City of Tulsa, the "Keep Oklahoma Beautiful" organization and the Metropolitan Environmental Trust (M.e.t.) sponsor many programs that directly or indirectly target litter control. These programs include but are not limited to:

Annual Creek Cleanup – Co-sponsored by the City of Tulsa's Parks Department during the month of April 2023. Volunteers removed litter from several different creek locations, such as Haikey Creek, Joe Creek, Mingo Creek, Dirty Butter Creek, Coal Creek, Vensel Creek, and Douglas Creek. Not only did this clean-up remove litter from the creeks, but it also helped to bring attention to the importance of reducing litter discharges to urban streams and waterways.

During this year's creek cleanup, we had 1,029 participants. This was significantly greater than our previous years. We determined that this was due to our new format allowing citizens to participate for the whole month of April. This was the third year we had this format and every year the number of participants has more than doubled from the previous year. We created a dashboard where citizens could go online and sign up for their location, date, and time they wanted to participate. The team made sure each location was ranked how accessible the location was and how much trash was present. This allowed citizens to choose a location that was best for them and to sign up with family members or groups. The volunteers disposed of 893 bags of trash collectively.

- *Earth Month* – This program throughout the month of April consisted of activities targeting the protection of resources including the reduction of litter and non-point source pollution.

- *Earth Day* – April 22, 2023 was set aside to draw attention to environmental efforts by citizens and area businesses, including reduction of litter and pollutants. This Earth Day Tulsa's Stormwater Quality group had a booth at the Tulsa Zoo Party for the Planet where almost 3,000 citizens attended.

Tulsa took advantage of the opportunity to educate citizens on the importance of eliminating litter at many special events during this reporting period. Public education at these events usually involved setting up a display and handing out materials such as brochures, Save Our Streams tote bags, pencils, etc. These events included:

- The Greater Tulsa Home and Garden Show: March 9th-March 12th, 2023
- Tulsa Public Schools Events: July 2022 – June 2023
- Enviro-Expo at Bartlett Square: April 19th, 2023
- Tulsa State Fair: September 29th-October 9th, 2023

A full list of public education activities conducted by the City of Tulsa can be found in Attachment B.

The Curbside Recycling Program continued offering every week pick-up of plastic, glass, paper, bimetals, aluminum, and other recyclables. Approximately 113,378 Tulsans participated which has resulted in the collection of approximately 19,252 tons of recyclables for this reporting period. This program is promoted on the city website.

Environmental educational activities were conducted at. Combined these events involved approximately 6,934 children. Children were educated on the importance of reducing litter, non-point source pollution and recycling through various activities. Other education activities included the use of videos, hands on landscape displays (i.e., "Enviroscape"), distribution of hand outs and material containing non-point source pollution information, hands on stream monitoring of the creeks and performing park clean-ups.

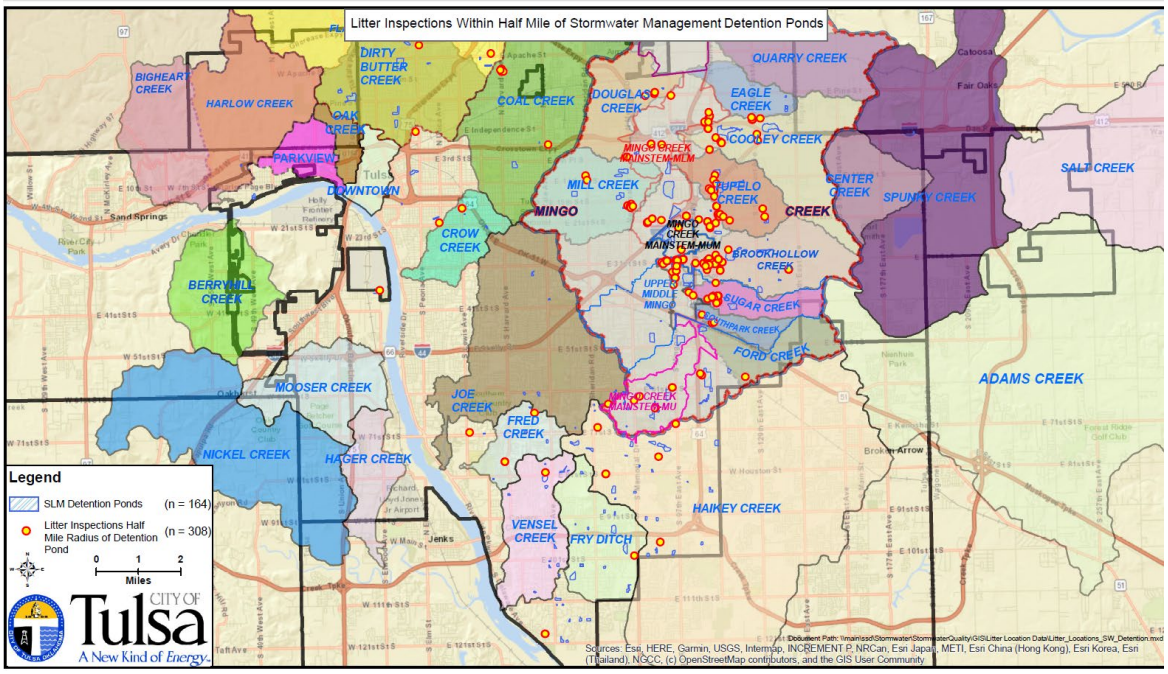
Tulsa, in conjunction with the Tulsa County Conservation District/Blue Thumb historically had a storm sewer inlet placarding program which included the message "No Dumping Save Our Streams Tulsa" or "Dump No Waste Drains to River" and has a telephone number to report violators. All new storm sewer inlets have a similar message prestamped on the hood. Therefore any placarded inlets will eventually be replaced with stamped inlets, making the placarding program unnecessary.

Tulsa's Stormwater Quality group began a litter monitoring program in September of 2017 with the goal of better understanding the litter problem in Tulsa and doing more targeted education. As more data has become collected, it is apparent the majority of the litter in Tulsa is caused by or associated with homeless populations. Tulsa has created several working groups and taskforce to mitigate homelessness and the negative impact to water quality via litter issues as well as bacteria from these encampments.

The following is a breakdown of litter inspections completed this year. This program will rotate through sections (watersheds) of Tulsa each year with the main goal of the program being to educate property owners on the need to keep litter picked up and prevent it from impacting the MS4. The employee in this position splits their time approximately 50/50 between conducting litter inspections and working in our Household Pollutant Collection Facility. This position had also been vacant then hamstrung by another vacancy in our Collection Facility, requiring more time of the employee there and less time for him to conduct litter inspections. Still they were able to accomplish the following:

- 238 litter inspections
- 3,878 total sq ft. of litter directed to be cleaned-up
- Five Notices of Violation including $350 in fines

The following map shows where the litter inspections were conducted in relation to Stormwater Maintenance and Operations (SMO) ponds. The data from this map is from previous years but is kept in an Arc GIS database and usually mapped weekly. However SMO recently lost the GIS employee who conducts this work. When the position is refilled, these maps will return to being updated. Litter inspection efforts are partially focused on proximity to stormwater management areas, so these features do not become conductors of litter throughout Tulsa. Again, this program is scheduled to rotate through Tulsa's watershed's, and is still in its beginning stages.



Two sets of litter BMP's were created and printed previously, one targeted towards businesses and the other towards citizens. This literature has been passed out as a result of one-one contact with citizens regarding issues as well as during public events.

The City of Tulsa has anecdotally noticed a continued increase in the amount of litter and illegal dumping issues in Tulsa. Many of these pieces of litter end up in Tulsa's streams as "floatables" potentially causing blockages and creating eyesores for the community's perception of its natural resources. It is these two issues that this litter inspection program aim's to abate, though the amount of time and resources currently dedicated to this issue is small compared to the breadth of the problem.

The Metropolitan Environmental Trust (The M.e.t.) continued to operate ten recycling depots that are conveniently located throughout the metropolitan Tulsa area. Citizens can bring plastics, newspapers, mixed paper, cardboard, glass, aluminum, batteries, cooking grease, used motor oil, and electronic recycling (at six locations) for recycling. These depots were also used for the distribution of environmental educational information, including brochures and environmental events posters. Additionally, the M.e.t. distributed, displayed anti-litter posters on its Facebook and Twitter accounts. The M.e.t. staff had a combination of 68 educational classes and/or booths. They also gave 120 speeches to classrooms on recycling and litter. In many of the grade school classes our educator provided bags and gloves and they conducted litter clean ups on the school grounds (approximately 28 litter clean ups).

Tulsa Parks emptied approximately 1,152 trash containers (placed at 102 parks and 15 stormwater detention sites) 1-2 times per week. Stormwater detention structures are multiple use facilities, which serve as city parks when not in use for stormwater detention. Additional trash containers were placed in parks to serve special events and

scheduled activities. In addition, maintenance crews picked up loose trash from parks a minimum of once per week. Trash containers with hinged lids have replaced opened topped barrels which have resulted in a reduction of loose trash blown about by the wind.

The SMO Division has crews that removed litter from 12 wet ponds and miles of lined and earthen channels that comprise Tulsa's storm sewer, thus reducing the amount of floatables discharged to waters of the state. During this fiscal year they spent 99 hours collecting 21 cubic yards of debris. The City of Tulsa's Public Facilities Section continued to utilize inmate work crews to remove litter along streets and expressways throughout Tulsa in an effort to keep the city free of roadside trash and debris. These crews removed over 634 bags of trash from along Tulsa's' roads.

Street curb lines within the Inner Dispersal Loop (Downtown Business District) were cleaned on a weekly basis. During this cleaning, crews simultaneously removed debris from the storm sewer intake structures. Pole mounted trashcans were inspected and emptied daily as needed.

The City of Tulsa also has an Adopt a Stream program. This has 7 adoptees. The creeks that are adopted are: Upper Mill Creek, Fred Creek, Arkansas River, Cherry Creek, Sugar Creek, Coal Creek, and Crow Creek. Adoptees must clean at least two times a year to continue to adopt their creek and the groups are recognized through road signage throughout the watershed. These signs also alert citizens which watershed they are in. These signs are aimed at making citizens more aware of Tulsa's streams and the need to keep them clean.

Tulsa's Solid Waste Division accomplished the removal of approximately 1,440 tons of trash through the placement of thirty cubic yard trash dumpsters in neighborhoods in Tulsa, 1,122 times. Tulsa had approximately 20,900 requests by citizens to pickup bulky waste (appliances, white goods, furniture) of which approximately 5lbs of Freon from Freon bearing items were properly evacuated. In addition, 40lbs of latex paint latex paint were picked up with the curbside bulky waste program from 20 requests.

The Solid Waste Program uses the visual observation efforts of various field officers and citizen reports to identify and locate dumpsites throughout the City of Tulsa. The sites are thoroughly searched for evidence to be used for possible enforcement actions. Active sites are monitored using intense visual inspection and when possible, concealed surveillance. After these activities are completed, the sites are cleaned, charted, and monitored for new dump activity. These activities serve to deter the reactivation of dumping in the area and encourage the use of proper disposal methods. As additional enforcement efforts signage is being suggested to be placed in these areas indicating 'No Dumping' and 'Dumpers Will Be Prosecuted'.

This year, the Solid Waste Division located 930 illegal dumpsites and conducted 678 investigations of illegal dumpsites within the city limits. Twelve citations were issued based on these investigations. Thirty-one signs have been added at routine dump locations in an effort to deter this continued illegal dumping. Dumpsite contents were from construction activities, demolitions, green waste, furniture, appliances, tires and other household items. During this fiscal year, they collected 296 tons of debris from these dumpsites.

City of Tulsa Security also was involved in approximately 780 homeless encampment removal and cleanup efforts. Nationwide populations of unhoused individuals has increased and Tulsa is seeing a rise in these same populations with various side affects to water quality including increased amounts of litter and the likely connection to increased fecal material being transported into waterways. A working group has been meeting to address this issue both from a City Mayor administration and Division's working group.

Other programs which clean up litter and trash throughout Tulsa include:

- The Better Way Program picked up 4,921 bags of trash totaling 28 tons.
- Center of Employment Opportunities program cleaned up 196 tons of trash and limb debris from the Right of way as well as removing and trimming 306 loads of green waste from roadways and side walks
- Community service crews removed 62 bags of trash and debris totaling 3.3 tons of trash and debris.

In addition, the City of Tulsa continued to collect and dispose of trash at its five floatable monitoring locations (see Section 4-Monitoring Data).

d.) Collection of used motor vehicle fluids and household hazardous wastes

Financial support continued for the M.e.t.'s recycling depots, which accept oil, antifreeze (only 2 of the 10 locations collect antifreeze), cooking grease and batteries, as well as other recyclable materials. All depots are open 24 hours per day (attended approximately 6 to 8 hours/day), seven days per week and are located in areas which are easily accessible to the public. The amount of material collected at these depots for the reporting period can be found in the following table. These numbers reflect totals from all the recycling depots and a pilot program that is collecting from nine restaurants/bars located throughout the greater Tulsa metropolitan area.

Material	Amount
Oil	25,460 gals.
Antifreeze	2,325 gals.
Plastics (incl. plastic bags)	313,370 lbs.
Aluminum and Steel	205,168 lbs.
Glass	705,189 lbs.
Batteries	17,730 lbs. automobile 21,960 lbs. household
Newspaper, Mix Paper, and Cardboard	658,702 lbs. paper 2,007,312 lbs. cardboard
Cooking Grease	2,872 gals.
Electronics	21,784 lbs.

Additionally, The M.e.t. conducts special collection events for hard to recycle items like tires and electronics. These collection events are also used to distribute educational material to the public regarding locations of the recycling depots and proper pollutant disposal.

During these collection events, educational fliers are distributed to the public. Each car received fliers regarding the following topics: (1) locations of the recycling depots, (2) latex paint disposal, and (3) Tulsa's Household Pollutant Facility.

The following are the collection amounts from M.e.t.'s specialized events within the City of Tulsa:

- 9/16/22 -Oakhurst Tire/E-Waste Collection Event-2085 tires and 212 lbs. e-waste
- 10/28/22- Aero Spirit Tulsa-5 tires and 25 lbs. of e-waste
- 10/29/22- DEA Takeback Central Tulsa Recycling Center-80lbs of medication
- 11/26/22-Trap the Grease-Central Tulsa Recycling Center-190 gallons.
- 10/1/22-12/1/22 Pumkin Rescue Tulsa Metro Recycling Centers-14, 700 lbs.
- 2/10/23 Lowes Tulsa Fire and Home Safety Event 71st and 169th-Combined #'s for Fire Extinguishers/Smoke Alarms-65, florescent Bulbs-4, and Thermometers- 2
- 3/4/23 Big Clean at Fairgrounds-100 pounds ammo, 424 pounds plastic bags, 4244 lbs.-car batteries, 1,950 pounds household alkaline batteries, 4,500 pounds cardboard, 21,784 pounds electronic waste, 160 fire extinguishers, 669 pounds medication, 34,000 shredded paper, 346 pounds sharps, 1,848 tires.
- 4/22/23 DEA Prescription Take Back at Central Tulsa Recyling Center– 50 pounds of medication.
- 5/12/23 through 5/13/23 Central Tulsa and Downtown Tulsa Recycling Centers-Fire Extinguisher/Smoke Alarm Event- 4 fire extinguishers, 32 smoke alarms

In FY 22/23, The M.e.t. staff answered calls and emails from citizens who ask what to do with their pollutants. Staff educates on where to take items and how to handle responsibly. Staff gave out voucher numbers for the Household Pollutant Collection Facility to citizens who live in outlying communities. This voucher number(s) allow citizens to use this Facility at no charge (if below 45 pounds). The charge is given to the outlying community through a contract arrangement between The M.e.t. and the City of Tulsa.

The City of Tulsa has a Household Pollutant Collection Facility at 4502 South Galveston Ave. The facility is open 2 days a week (Wednesdays and Saturdays) from 8:00am till 4:30pm. This facility replaced the biannual collection events and has resulted in an easier and quicker method of pollutant disposal for Tulsans and the surrounding communities. This facility has been well received by the public as evidenced by our survey results and social media recognition. This facility was promoted in the November 2022 and February 2023 utility bill stuffers.

Below is a summary of the amounts of pollutants collected during the calendar year 2020:

Total weight collected: 359,989 lbs
Total Tulsa customers: 3,244
Total M.e.t. customers: 664
Total Customers from outside Tulsa and M.e.t. communities: 60

The following is a breakdown of the wastestreams per category:

Wastestream	Amount Collected
Toxic Liquid	**33,687lbs**
Toxic Solid	**10,840lbs**
Aerosols	**9,892lbs**
Low Viscous	**15,192lbs**
High Viscous	**18,068lbs**
Bulbs	**2,304lbs**
Bases	**9,162lbs**
Acids	**5,946lbs**
Oxidizers	**3,898lbs**
Flammable Loosepack	**15,684lbs**

In addition to the above household pollutants, the facility also collected and disposed of:

- 191,440 pounds of latex paint
- 2,450 pounds of used oil
- 1,100 pounds of antifreeze
- 10,450 lbs. of batteries
- 350 gallons of cooking oil

e.) Locate and eliminate illicit discharges and improper disposal

Dry weather field screening was conducted on approximately 51 square miles (32,557 acres) of the Tulsa's storm sewer system during the period of July 1, 2022 to June 30, 2023. Thus compliance with this section of the permit was achieved by screening > 20 % of the Tulsa's MS4. The dry weather field screening program was designed to locate illicit discharges and illegal disposals into Tulsa's storm sewer.

A total of 113 outfalls were screened, of which 37 contained flows during dry weather periods. Once dry weather flow was located, the flow was sampled and tested for pH, temperature, appearance, conductivity, detergents, chlorine, copper, ammonia and fluoride (See Section 4 for specific data collected during dry weather field screening). If contaminants were identified in concentrations above action levels then a dry weather flow follow-up investigation was conducted. Dry weather flow follow-up investigations continued until the source of the flow was identified. When the source of the illicit discharge was identified it was eliminated.

The SMO Division continued to conduct random industrial inspections. Inspections were conducted to achieve compliance with Part II(A)(8) Industrial and High Risk Runoff. During these inspections, inspectors were checking for illicit discharges to the MS4 or the potential for an illicit discharge. If an illicit discharge was found, action was taken to halt the discharge using the Pollution Ordinance.

As addressed in Part II(A)(6)(b), Tulsa continued efforts to reduce sanitary sewer overflows into storm sewers during this reporting period. This was accomplished through the use of TV inspections and smoke testing techniques. Work completed during the reporting period included:

64 miles of sanitary sewer TV inspected
13.9 miles of storm sewer TV inspected
134 sanitary manholes raised to grade
1,364 linear feet of main line storm sewer repairs
234 main line sanitary sewer repairs
21,445 linear feet of main line sanitary sewer replaced or rehabilitated

These repairs resulted in the reduction of stormwater inflow and infiltration into the sanitary sewer, which in turn reduced sanitary sewer overflows and illicit discharges to the storm sewer system. Rehabilitation projects supplemented Tulsa's efforts by correcting known structural storm sewer problem areas (see Part II(A)(6)(b) Sanitary Sewer Overflows).

As previously mentioned, investigation/complaint procedures currently in place continue to be very effective in locating illicit discharges and improper disposal practices during this reporting period.

f.) Removal of illicit discharges

Once the source of an illicit discharge was located the responsible party was required to halt the discharge, redirect the discharge to the sanitary sewer or obtain an OPDES wastewater discharge permit from the ODEQ. Thirty-four illicit discharges were eliminated from Tulsa's MS4 during this reporting period as a result of enforcement of the Pollution Ordinance.

g.) Maintain a list of OPDES permit holders within the City of Tulsa

Databases are maintained for all OPDES permits for all discharges from construction, industrial activities, and OPDES wastewater discharge permittees within Tulsa. These databases include the name, address, OPDES permit number, contact person, SIC code(s) and other information. Updates were made when information became available. This information is usually obtained through inspections or ODEQ notification.

Part II(A)(7) Spill Prevention and Response

Status: Compliant and ongoing

All agencies and City Departments responding to spills are instructed to follow the City's Pollution Ordinance. This ordinance requires the removal of a pollutant rather than disposing to the storm sewer, unless there is an immediate threat to life and health. The Pollution Ordinance provides SMO with the authority to require the responsible party to clean up the spill. This Ordinance also gives the authority to recoup all cost incurred from the responsible party. The Stormwater Maintenance and Operations Division has authority to oversee all clean-up work involving spills within the City of Tulsa.

This requirement was achieved as delineated in a Memorandum of Agreement between the Tulsa Fire Department (TFD) Hazardous Materials Unit, the Tulsa City – County Health Department and the Streets and Stormwater Department (now Public Works Department). In accordance with Section 300 of the TFD Emergency Operation

Procedures, all agencies and City departments responding to spills ensured compliance with the Pollution Ordinance by removing spilled pollutants rather than flushing it into the storm sewer, unless there was an immediate threat to public health and safety.

The TFD Haz-Mat Unit responded to incidents involving spills or possible releases of chemicals or pollutants which either had the potential to or were discharged to the City's sanitary or storm sewer. Whenever the TFD responded to a spill that had entered either the sanitary or storm sewer system, the Public Works Department was notified to evaluate impact on sewer systems and coordinate remediation activities.

If the responsible party was identified, they were required to conduct the clean up or hire a remediation company. In cases involving remediation, all work was inspected to ensure a proper and thorough clean up.

Below is a summary of the investigations conducted by the Stormwater Maintenance and Operations Division:

Number of Investigations	Description of Investigations
20	**Construction** (relating to construction site potential violations)
14	**Hazmat** (relating to potential discharges of pollutants from fire department responses involving the hazardous materials unit)
230	**Stormwater** (relating to potential releases of pollutants to the storm sewer or violations of the Pollution Ordinance)
2	**Drug Labs** (relating to the potential release of pollutants from drug lab remediation to the storm sewer or violations of the Pollution Ordinance)
266	**Total number of investigations for this reporting year**

SMO inspectors conducted 401 industrial stormwater runoff inspections, each involving a discussion regarding spill prevention and management with industrial representatives.

Agreements have been put into place between Tulsa and both the Oklahoma Turnpike Authority (OTA) and the Oklahoma Department of Transportation (ODOT) that address spills that occur on OTA or ODOT MS4s within Tulsa.

Part II(A)(8) Industrial & High Risk Runoff

Status: Compliant and ongoing

Tulsa continued to use the Industrial & High Risk Runoff program to identify, monitor and control pollutants from municipal landfills; treatment, storage and disposal facilities for municipal waste; facilities subject to EPCRA (Emergency Planning and Community Right-to-know Act) Title III, Section 313 reporting requirements; and any other industrial or commercial discharge the City determined had the potential to contribute substantial pollutant loading to the City's storm sewer system. This program contains procedures for inspecting, monitoring, and controlling pollution from the aforementioned sources. A database of industrial stormwater sources discharging to the City's storm sewer continues to be maintained.

During this reporting period, 401 industrial stormwater inspections were conducted. Fifteen enforcement actions were taken against industries or facilities in order to eliminate illegal or illicit discharges. $450 in fines was associated with these enforcement actions.

This program has also provided an opportunity to educate owners and operators of industrial or commercial facilities concerning stormwater quality regulations and requirements as per ordinances and regulations.

Part II(A)(9) Construction Site Runoff

Status: Compliant and ongoing

a.) Structural and non-structural best management practices

Through inspections and enforcement actions, Tulsa required construction sites to implement and maintain adequate structural and non-structural (BMPs) during this reporting period. The use and maintenance of structural and nonstructural best management practices (BMPs) to reduce pollutants discharged to the City's storm sewer from construction sites has been achieved through control measures provided in the Pollution Ordinance, Title 11-A, Chapter 3 (Watershed Development Regulations), Chapter 5 (Pollution Ordinance), Title 35 Infrastructure Development Process (IDP), and building permits.

During this reporting period Tulsa's Development Services section issued:

24 Watershed Development permits, which include Earth Change permits.

137 Stormwater Drainage permits

727 Stormwater Connection permits

143 Floodplain permits

16 Floodway permits

These permits require the operator to have adequate erosion control measures in place and maintained prior to, and throughout the duration of the project until final stabilization. Prior to receiving an Earth Change permit; applicants were required to submit an NOI and storm water pollution prevention plan for all sites disturbing at least one acre. Additionally, 17 Stormwater Pollution Prevention plans were reviewed to ensure the use and maintenance of structural and nonstructural erosion control BMPs at construction sites.

b.) Inspection and control of construction sites

Inspection and enforcement of control measures to reduce soil erosion at construction sites is shared between several City groups (SMO, Development Services and Engineering Services). SMO conducted a total of 1,629 construction site inspections for compliance with erosion control measures and issued 11 enforcement actions. The total amount of fines and penalties collected was $700.

Development Services conducted 2,421 erosion control inspections at the same number of construction sites. Pre-construction erosion control inspections were conducted on all sites and this resulted in 38 failed inspections. If a site is in violation, the inspector contacts the builder and informs him/her of the actions which must be taken to come into compliance. If voluntary compliance is not achieved, the SMO Division conducts follow-up inspection to ensure compliance with the Pollution Ordinance. If the site is still non-compliant appropriate enforcement action is taken. Building permits were not issued for construction sites larger than one acre until a stormwater pollution prevention plan was in place.

Engineering Services Division conducted daily inspections on 84 city and 36 privately funded Infrastructure Development Process (IDP) projects. Implementation and continued compliance with the Pollution Ordinance was enforced. Appropriate structural and nonstructural erosion control measures were inspected during these site inspections. If the existing erosion control methods were inadequate, additional structural or nonstructural BMPs were required. Engineering Services has the authority to revoke Watershed Development Permits as a result of failure to implement and maintain adequate erosion control measures. None of these permits were revoked during this reporting period, but violations were reported to the contractors at weekly progress meetings. This resulted in corrective action leading to compliance.

c.) Education and training of construction site operators

The brochure “Construction Site Best Management Practices” was available to construction operators at the Permit Center. Construction operators normally must visit the Permit Center in order to obtain Watershed Development permits from the City of Tulsa, but during the pandemic, access to this resource was restricted though this brochure is still available on the City of Tulsa website. This brochure lists erosion and sediment controls that can be utilized at construction activities. This brochure was also

available at other events (see Attachment B). Approximately 130 of these brochures distributed during this reporting period.

To assist local developers and builders with the use, installation and maintenance of erosion control measures, City of Tulsa representatives in the past attended Builders Council as well as Developer Council meetings held at the Greater Tulsa Home Builders Association as we are able. These meetings prior to the pandemic had been held monthly, but lately have been occurring with less frequency.

City inspectors conducting soil erosion control inspections at construction sites, informed construction site operators on aspects of use and maintenance of appropriate structural and nonstructural BMP's. Additionally, City of Tulsa supervisors answered questions regarding construction site OPDES requirements and erosion control requirements.

Although formal training was not conducted by Field Engineering, whenever a contractor was out of compliance, Field Engineering took the time to train contractors on the correct installation of erosion control measures. City inspectors conducting soil erosion control inspections at construction sites informed construction site operators on aspects of use and maintenance of appropriate structural and nonstructural BMPs. Additionally, City of Tulsa supervisors answered questions regarding construction site OPDES requirements and erosion control requirements.

Building permit applicants of all private developments were notified of their responsibility under the OPDES permitting program during the building permit application review process and during any pre-submittal meetings. Through the infrastructure development process (IDP), proposed developments were reviewed, and applicants were notified of the OPDES erosion and sediment control requirements prior to issuing IDP project permits. The City of Tulsa offers pre-development meetings to those considering a new development within the City. These meetings are site specific and provide guidance on all requirements. Included in the discussion is the requirement for erosion control throughout the construction period and the permanent requirements to prevent stormwater pollution. In addition, the City explains storm water pollution requirements when we conduct presentations or training to the development and building communities.

d.) Building permit applicants notification

Building permit applicants of all private developments were notified of their responsibility under the OPDES permitting program during the building permit application review process and during any pre-submittal meetings. Through the infrastructure development process (IDP), proposed developments were reviewed, and applicants were notified of the OPDES erosion and sediment control requirements prior to issuing IDP project permits.

In addition, the City explains stormwater pollution including the use of Low Impact Development (LID) as an effective Best Management Practice. Utilizing the

predevelopment meetings and the IDP process to open the discussion about implementing LID practices before any development has actually taken place makes successful implementation of practices more likely to occur. In addition, the City explains stormwater pollution requirements and the benefits of LID when conducting presentations or training to the development and building communities.

Developers and design engineers were provided the "OPDES General Permit for Stormwater Discharges from Construction Activities (OKR10)" information. Anyone obtaining an OPDES General Permit for Stormwater Discharges from Construction Activities (OKR10) submitted a stormwater pollution prevention plan along with an NOI, for review and approval prior to receiving an Earth Change permit. A stormwater pollution prevention plan checklist was utilized during the review process.

Part II(A)(10) Public Education

Status: Compliant and ongoing

The City of Tulsa Stormwater Quality group continues its robust public education efforts through the implementation of strong media campaigns. In total Stormwater Quality outreach was viewed 8,791,773 times including via digital media, tv ads, public events, utility bill stuffers, etc…The Stormwater Quality group continued the collaboration with Byers Creative to develop new animated commercials for social media and 30 and 60 second live action videos to help deliver stormwater quality public education messages. City Communication staff posted 89 messages to social media with stormwater messages this period. Tulsa's Facebook page has 52,500 followers, Twitter 61,000 followers, and 6,700 followers on Instagram which allow these messages to reach quite a large audience. The animated commercials show how leaves and grass, pet waste, and household pollutants can make their way into the storm sewer system causing contamination. The 60 second videos expand upon this concept by further showing how the "Little Things" we do in our daily lives can have a negative impact on water quality. In addition to these new commercials, Sgt. Red and Mingo continue to be used in commercials, coloring books, signs etc…during parts of this reporting period.

The below table shows the number of views from the commercials, in addition to the number of radio and digital ad impressions.

Media	**Impressions**
Spotify	1,120,075
Pandora	251,226
Channel 2	1,445,000
Channel 8	303,00
Channel 6	747,320
KWGS Public Radio	85,000
OTT (ch 2) (Digital streaming adds)	163,361

The City of Tulsa maintains a TV channel for the broadcast of public meetings, events, and forums. During non-broadcast times, various videos including several Stormwater Quality videos are shown, including the Household Pollutant Collection Facility commercial in a rotation in background programming that plays 7 days a week, 24 hours a day when live meetings are not scheduled. Live meetings comprise about 15 hours a week, so each video has played around 153 times a week, or 7,956 plays for each video during a fiscal year. The audience size is all of Cox Cable subscribers in the Tulsa area, since TGOV is on basic cable. According to a City of Tulsa Citizen Survey, TGOV is viewed by nearly 50 percent of Tulsa households. According to 2020 U.S. Census data, the estimate for the number of households in Tulsa is 175,943 so TGOV is viewed by approximately 87,971 households. TGOV also streams continuously online at tgovonline.org.

The City of Tulsa passes out tote bags, pens, pencils, rain gauges, pet waste bags, tumbler cups, notepads, folders, and fishing poles with a sticker that has our SOS logo, among other promotional products with the website and phone number on it. These items are very popular and well received at in-person events and are geared toward starting a conversation with a citizen about water quality topics. Pet waste bags are given away to encourage citizens to pick up their pet's waste. Citizens are educated on how much pet waste is washed into our storm drains and how that impacts our environment. Magnetic chip clips are also given away as a useful reminder to help citizens know where they can properly dispose of their household cleaners and has the Household Pollutant Collection Facility contact information.

Tulsa and its educational partners continued to educate the public on the prevention of pollution at the source. To get the most from each educational opportunity, many public educational activities targeted multiple sources of non-point source pollution, including

vehicle fluids, pesticides, herbicides, fertilizers, and erosion control practices. A detailed description of the City of Tulsa's public education efforts can be found in Section 6(c).

The following groups participated in various public education events during this reporting period:

- City of Tulsa
  - Public Works Department
  - Parks Department
  - Communications Department
- Tulsa County Conservation District (Blue Thumb Program)
- Metropolitan Environmental Trust (M.e.t.)

Education Activities Included:

- Displays at workshops and conferences
- Public presentations at conferences and seminars
- Presentations at local schools
- Presentations at homeowners' associations and neighborhood gatherings
- Creation and distribution of educational material (brochures, activity sheets, note pads, etc.) at a number of events
- News press releases and articles informing the public about environmental issues, including non-point source pollution
- Environmental awareness at numerous events
- Utility bill stuffer – stormwater information sent to all citizens that purchase water and sewer as well as pay utility bills to the City of Tulsa

See Attachment B for a full list of Educational Activities.

During this reporting period, Tulsa continued to create and utilize existing brochures, pamphlets and handouts to meet and exceed all its public education requirements. A complete listing of this material can be found as Attachment A "Educational Material Distributed 2022-2023". Attachment B "Education Events 2022-2023" is a complete listing of all the public education events the Stormwater Quality group participated in during this reporting period. Both these attachments can be found in the appendix of Section 6.

The Tulsa County Blue Thumb Program continued its efforts to reduce non-point source pollution. The Tulsa County Conservation District (TCCD) is involved with this Clean Water Act Section 319 funded program, which utilizes citizen volunteers. Volunteers have contributed 2,304 hours of work to the Blue Thumb program's activities. Tulsa County has the most streams monitored statewide. Seventeen streams are monitored by this group in the Tulsa area. The program's goal is to make citizens of Tulsa aware of non-point source pollution and to encourage the adoption of practices that protect Tulsa's streams. This program has contributed greatly to the education of the public through the organization and training of citizen watershed monitoring groups and distribution of the "Blue Thumb Fish Prints". The Blue Thumb Program continues to collect data from area streams and uses this data to focus educational activities within the affected watersheds. This education involves informing local citizens on how to protect their streams against

non-point source pollution. The TCCD continues to promote the Blue Thumb Program and encourage participation at public events, such as the Greater Tulsa Home and Garden Show and the Enviro Expo.

The Stormwater Quality group administers an electronic newsletter that is sent out quarterly to an estimated 2,072 email addresses. Through this newsletter recipients are educated on stormwater issues such as proper disposal of grass clippings, businesses that are practicing Best Management Practices are recognized and stormwater quality educational events are promoted. The public is also informed of ways they can help improve and maintain stormwater quality, how they can contact the City of Tulsa for more information, request personnel to come speak at an event and how to report illicit discharges. This newsletter was sent out in June, October, and December 2022 as well as March 2023.

The City of Tulsa hosted a rain barrel sale May 6th and 13th which resulted in the sale of almost 400 barrels from 282 citizens. These events also resulted other water quality education and promotion of the Tulsa Household Pollutant Collection Facility, which is where the event was hosted.

The Crow Creek Community is a group of environmental organizations and citizens with the shared goal of improving the water quality in Crow Creek, one of Tulsa's most visible and historic streams. This group came together in approximately 2016 and has conducted many water quality events, demonstrations, creek walks, and litter pickups during that time. The group has a quarterly newsletter which is sent to around 200 citizens as well as printed and given out at many businesses in the watershed.

The Stormwater Quality Section created several brochures and flyers that focus on different types of pollutants that can get into storm drain. Not all of them were distributed during this fiscal year, and several of them are being phased out as we transition the info to newer streamlined brochures, but still give out the remaining old brochures which had already been printed. The list of materials distributed can be found in Attachment A. Some of our other available brochures include Pool Water Disposal, Carpet Cleaning, Rain Barrel Assembly Instructions, and Latex Paint Disposal.

The Stormwater Quality group partners with the City of Tulsa's Working in Neighborhoods (WIN) department to further public education efforts. The WIN newsletter goes to 528 neighborhoods and 113,362 members on the Nextdoor app. This newsletter talked about our Stormwater messaging in the April 2023 article. The Stormwater Quality group utilizes this newsletter to help spread the word about upcoming educational events and programs. Details of WIN newsletter announcements can be found in Appendix B.

With the expansion of the Marketing and Creative studio, the City of Tulsa has undertaken many additional outreach videos over the last several years, including an explanation and overview of the Watershed Characterization Program. This video has been shared on social media and posted to Youtube and has been viewed 97 times. In

addition to the new Biosampling video, stormwater has videos on YouTube that demonstrate the importance of keeping our storm drains clean. The most viewed stormwater video was watched almost 5,000 times. In total the Stormwater Department has 25 videos. The videos focus on pollutants such as pet waste, litter, and motor oil, and discussed how to remediate these problems.

a.) Public reporting of illicit discharges and improper disposal

Numerous publications that promote the public reporting of illicit discharges and improper disposal were created and distributed by the City of Tulsa. Regular distribution locations included Tulsa Parks, Recreation Centers, and libraries. During this reporting period, 6,412 pieces of literature were given out at these venues. Material was also distributed at events such at events though these continued to be somewhat limited by the pandemic. The following is a partial list of publications distributed:

> *"Stormwater Quality Programs"* is a general brochure highlighting the current stormwater quality programs in the City of Tulsa. Also provided in the brochure are ten solutions to stormwater pollution, including the reporting of illicit discharges, and lists a telephone number and instructions on how to do so. This number is promoted all educational material distributed through our stormwater quality programs.
>
> *"City of Tulsa – General Guide to Regulatory Floodplains"* is a brochure designed to guide the public through floodplain requirements within the City of Tulsa. It provides a telephone number and encourages the public to report illegal discharges into the storm sewer.
>
> *"City of Tulsa Official Floodplain Notice"* and *"Flood Hazard Information About Your Property",* are two brochures that were sent to over 15,000 residences last year who live in or near the floodplain, have the potential to experience flooding and what to do in case of flooding. It provides a contact telephone number and encourages the public to report illegal discharges into the storm sewer.
>
> "*City of Tulsa Floodplain Map Atlas*" is a hardcopy atlas/book that shows the FEMA SFHAs and the City of Tulsa Regulatory Floodplains throughout the City. The atlas also provides flood hazard information as well as provides phone numbers for citizens to report blocked drains or illegal dumping.
>
> "*2023 Repetitive Loss Area Notice*" is an annual publication that goes to approximately 750 property owners who are near a repetitive loss property. A repetitive loss property is defined as a property that has filed one or more insurance claims for flood losses in the past 10 years. This publication provides phone numbers for citizens to report blocked drains or illegal dumping.
>
> "*Know Your Risk of Flooding*" is a new brochure that is handed out during public events and/or meeting. It provides tips on what to do before, during, and after a flood event. It also provides facts about flood insurance.

"Know the Facts about Flooding Before You Buy or Remodel a Home" is a new brochure that is handed out during public events and meetings. This brochure provides information on things to consider when buying or remodeling a home in or near a regulated floodplain. It provides facts on floodplain determinations, building permits and flood insurance.

During this reporting period, information was placed into three monthly utility bill stuffers in January, February and March 2023 encouraging the public to report illegal discharges. These articles gave instructions on the proper procedures for reporting along with telephone numbers for the 311 Center, which is the primary method for reporting of citizen concerns. Additionally, the 311 Center has 'on hold' messages that deliver stormwater quality information to callers. Multiple message topics were conveyed to callers during this time period. In previous years, almost 600,000 calls were made to the Customer Care Center.

Tulsa maintains a website, www.cityoftulsa.org/sos that has several links to tips that promote ways to reduce stormwater runoff pollution including the public reporting of illegal discharges to the storm sewer. The number of pageviews was 5,926 during this time a slight decrease from previous years. While conducting inspections, City of Tulsa personnel continued to direct citizens, business owners or operators to our website for more information about our programs.

Tulsa's Annual Creek Cleanup. Co-sponsored by the City of Tulsa's Parks Department during the month of April 2023. Volunteers removed litter from several different creek locations, such as Haikey Creek, Joe Creek, Mingo Creek, Dirty Butter Creek, Coal Creek, Vensel Creek, and Douglas Creek. Not only did this clean-up remove litter from the creeks, but it also helped to bring attention to the importance of reducing litter discharges to urban streams and waterways. The Stormwater Quality public education is geared towards a variety of audiences. The Save Our Streams social media pages posted ads discussing the Great Tulsa Cleanup, the Household Pollution Collection Facility, and many other events. On average the ads reached roughly 4,542 people per post.

As a result of public awareness of the reporting of illicit discharges and improper disposal, 266 investigations were conducted involving the identification and removal of 34 illicit discharges to the storm sewer during this reporting period.

b.) Proper management and disposal of used motor vehicle fluids and household hazardous wastes

Public education in the proper management and disposal of used motor vehicle fluids and household hazardous wastes was accomplished through various methods. These methods include the distribution of the following educational material:

"Motor Oil" is a brochure distributed during this reporting period that targeted the proper use, storage and disposal of motor oil.

"Stormwater Quality Programs" is a brochure given to the public detailing our stormwater quality programs. Included in the brochure is information on the adverse effects of household chemicals on the environment as well as instructions on how to dispose of chemicals properly.

"City of Tulsa – General Guide to Regulatory Floodplains" is a brochure designed to guide the public through floodplain requirements within the City of Tulsa. It provides a telephone number and encourages the public to report illegal discharges into the storm sewer.

"City of Tulsa Official Floodplain Notice" and *"Flood Hazard Information About Your Property",* are two brochures that were sent to approximately 15,000 residences last year who live in or near the floodplain, have the potential to experience flooding and what to do in case of flooding. It provides a contact telephone number and encourages the public to report illegal discharges into the storm sewer.

"*City of Tulsa Floodplain Map Atlas*" is a hardcopy atlas/book that shows the FEMA SFHAs and the City of Tulsa Regulatory Floodplains throughout the City. The atlas also provides flood hazard information as well as provides phone numbers for citizens to report blocked drains or illegal dumping.

On January 6, 2016, the City of Tulsa opened the new Household Pollutant Collection Facility at 4502 South Galveston Ave. The facility is open 2 days a week (Wednesdays and Saturdays) from 8:00 am till 4:30 pm. See Part II(A)(6)(d) for a summary of the pollutants collected this year, including motor oil, various vehicle fluids, and most household pollutants. Education material is distributed at this Facility.

At most of the major events and outreach, the used motor vehicle fluid and household hazardous waste brochures were distributed. See attachments for specific info.

Currently, The M.e.t. has ten drop-off recycling depots with collection containers for used motor oil, cooking grease and batteries. Two of the ten locations have containers for antifreeze collections. The "Recycling Locations" map flier and the "Tulsa Area Recycling Directory" both provide locations to the depots. These handouts are given during speeches, booths and events. The website, www.metrecycle.com promotes the events and depots. Staff had interviews on local news television stations before and during the specialized collection events. Fliers are distributed at booths, speeches and events throughout the year (see list below).

In regard to quantities of fliers distributed in FY 22/23 at events, educational booths or mailed to public:

Tulsa area Recycling Directory: 3,000
Buy Recycled, Close the Loop: 25
Latex Paint and the Environment: 500
Don't Flush Your Unused Medications Down the Toilet or the Frog Gets It: 200
Deep Green Clean: 200
Recycling Locations Map: 3,000
Tulsa Green Steam: 500
Why Should I Recycle Batteries: 500
Where Should I Recycle E-waste: 600
Focus on the Four: 2,000
COT Medication Flier: 200
Mercury in Your Home: 15

The revised specifications for new storm sewer inlet hoods include the message "Dump No Waste, Drains to River". These specifications were accepted by the City of Tulsa and the new inlet hoods have been obtained. As a result, all new or repaired catch basins will now have the message permanently cast into the hood therefore not requiring a placard.

Environmental educational activities were conducted at Tulsa Parks, Girl Scouts Day Camps, Summer Camps, and STEM Fairs. Combined these events involved approximately 6,934 children. Children were educated on the importance of reducing litter, non-point source pollution and recycling through various activities. Other education activities included the use of videos, hands on landscape displays (i.e., "Enviroscape"), distribution of hand outs and material containing non-point source pollution information, hands on stream monitoring of the creeks and performing park clean-ups. More details about this program can be found on Attachment C in the Appendix of Section 6.

c.) Proper use, application and disposal of pesticides, herbicides and fertilizers

The responsibility of educating the public on the proper use, application and disposal of pesticides, herbicides and fertilizers was accomplished through the distribution of educational material (brochures, videos, ads, etc.), public speaking engagements, and utility bill stuffers. The following section lists some of the materials and activities used to comply with this requirement. An extensive list along with the number of pamphlets distributed can be found in Appendix A and B of Section 6. This info was also promoted in three utility bill stuffers, during Jan., Feb. and March 2023.

> *"Fertilizers" and "Pesticides"* are two brochures which emphasize the proper application and disposal for the use of pesticides and fertilizers. It also lists alternatives to chemicals to control pests and fertilize lawns.
>
> *"Stormwater Quality Programs"* is a brochure given to the public detailing our stormwater quality programs. Included in the brochure is information on the

adverse effects of pesticides and fertilizers on the environment as well as instructions on how to dispose of them properly.

"Pollution Prevention Plan" is a Best Management Practice (BMP) created to guide citizens to do their part to keep our storm sewer clean. It addresses a number of pollutants including but not limited to fertilizers, herbicides and pesticides.

The Master Gardeners Program sponsored by Oklahoma State University - Tulsa Cooperative Extension Office maintains a telephone information service for the public regarding all aspects of gardening and landscaping, including the proper application and disposal of pesticides, herbicides and fertilizers. This service is offered five days a week, between 9 a.m. and 4 p.m. and has numerous brochures available to the public. See Part II (A) (5) "Pesticide, Herbicide and Fertilizer Application" for more information about this program. This program was publicized by Tulsa through the distribution of the *"Fertilizers"* brochure. OSU provided additional advertising through various means.

The Tulsa County Conservation District and Oklahoma Conservation Commission recently began a program to recognize and promote healthy yards for pollinators, soil, and water quality. This program is called Yard-by-Yard and has 38 members in Tulsa County. Below is their summary of the program:

Through our Yard-by-Yard Community Resiliency Project, residents will find not only support to do the right things for their yard and community, but also recognition for their efforts and the chance to encourage others. Whole neighborhoods coming together for the greater good can absolutely add strength, health, and resilience to our city. Wonderful and impactful things will happen. participants will get to enjoy wildlife neighbors like birds, butterflies, and bees. They will cut down on the amount of waste going into a landfill. They will enjoy the blossoms of native plants, and will savor the taste of home-grown fruits and vegetables. participants will improve the health of the soil, and conserve our most precious resource of all: water. We believe individual stewardship efforts contribute to a greater movement reclaiming our connection to the Earth one yard at a time.

The City of Tulsa requires all City personnel, as well as all City contractors that apply pesticides and herbicides to be licensed and subject to all the regulations under the Oklahoma Pesticide Applicators Law, including re-certification. City personnel that apply pesticides, herbicides and fertilizers received annual in-house training on specific types of pesticides, herbicides and fertilizers that are applied. When available, employees attended workshops, conferences and additional training on pesticides, herbicides and fertilizers application and disposal. The Tulsa Parks Department and SMO Division received training many times throughout the fiscal year.

Tulsa's website contains guidance for pesticide and fertilizers application for both commercial and residential applicators. This website is located at www.cityoftulsa.org/sos and is regularly promoted.

Part II(A)(11) Employee Education

Status: Compliant and ongoing

Presentations were made to personnel from Tulsa Fire Department, Sewer Operations and Maintenance, and Street Maintenance among others on their responsibilities at facilities and job sites.

Employees in the Public Works Department are eligible for promotional advancement upon completion of a "Stormwater Operator Certification" program conducted by the Stormwater Maintenance and Operations group. This two day- sixteen-hour course covers topics such as stormwater history in Tulsa, maintenance responsibilities, and Low Impact Development. It includes both classroom and field work and attendees are required to pass a test for certification. To date 184 employees have been certified. During this FY, 13 employees attended the training.

All City of Tulsa contractors as well as all employees that are required to apply pesticides, herbicides and fertilizers are required to be licensed under the Oklahoma Pesticide Applicators Law. In-house training regarding the application of various chemicals was conducted for city applicators during this reporting period. See Part II (A) (5) Pesticide, Herbicide, and Fertilizer Application.

City contractors responsible for herbicide, pesticide and fertilizer application, as well as landscape specialists and other lawn care providers were specifically educated on the proper use of chemicals, disposal thereof and spill prevention procedures. The City of Tulsa requires all contract applicators to be licensed under the Oklahoma Combined Pesticide Law and Rules (Title 2 of the Oklahoma Statues). This license requires each applicator to properly apply, dispose and address spills in an environmentally friendly manner.

Part II(A)(12) Monitoring Programs

Status: Compliant and ongoing

a.) Dry weather field screening program

The dry weather field screening program continued during this reporting period. The details of this program are previously mentioned in Part II (A) (6) (e).

b.) Watershed characterization program

See Section 4. This section includes information on the analytical, biological, and habitat measurements taking during this years sampling, as well as follow-up and response information and program details including Microbial Source Tracking info and data.

c.) Industrial and high risk runoff

The following table is a list of facilities classified under the SWMP as "Industrial and High Risk Runoff". This designation requires them to conduct self monitoring of their stormwater runoff. A summary of the number of industries that conducted monitoring during the permit life are as follows:

I&HRR Facility Categories	# of facilities identified	# conducting monitoring
Municipal landfills	**1**	**0**
Other treatment, storage and disposal facilities of municipal waste (e.g. transfer stations, incinerators, etc.)	**6**	**1**
Hazardous waste treatment, storage, disposal and recovery facilities	**2**	**0**
Facilities that are subject to EPCRA Title III, Section 313	**27**	**27**
Industrial or commercial discharges the permittee determines are contributing a substantial pollutant loading to the MS4.	**1**	**1**

Letters informing industries of their responsibility to conduct monitoring were sent out at the end of FY 13-14 and FY 22-23. All monitoring results were required to be submitted to the Stormwater Maintenance and Operations Division within one year. All monitoring results were reviewed and placed in the industry's activity file. Additional information regarding this program can be found at Part II (A) (8) Industrial & High Risk Runoff.

Legal Authority

The City of Tulsa utilizes several Ordinances to ensure compliance with OPDES Permit #OKS000201. The following is a list of the most commonly used Ordinances accompanied by a brief description.

Title 11-A Chapter 3 (Watershed Development Regulations) – This Ordinance allows for the regulation of the methods for handling and disposing of stormwater run-off; the development, excavation, grading, regrading, paving, land filling, berming and diking of land; allows for the regulation of development within flood plains in order to assure that development is not dangerous to health, safety or property due to stormwater run-off; and allows for the regulation of the connection to and use of the stormwater drainage system. Through this Ordinance, Tulsa permits construction activities that are one acre or greater.

Title 11-A, Chapter 5 (Pollution) – This Ordinance was adopted in November of 1995 in order to give Tulsa the legal authority needed to comply with all of the municipal separate storm sewer system discharge permit requirements that were not covered by existing Ordinances. It prohibits illicit discharges to the storm sewer; allows for the control and monitoring of stormwater runoff; provides Tulsa with the legal means to inspect and investigate potential sources of pollution to the storm sewer; and contains judicial enforcement remedies. This Ordinance was revised during 2006-2007 reporting period to include provision for recovery of cost incurred by Tulsa against violators of this Ordinance. Maximum amount of fines per violation per day is $1,000.00.

Title 11-C, Chapter 12 (Requirements For Industrial Users To Discharge To The Sanitary Sewer Systems) – This Ordinance provides general sewer use requirements; allows for wastewater discharge permit issuance and inspection of all industries that discharge to the sanitary sewer; prohibit the inflow of stormwater into the sanitary sewer system; and contains judicial enforcement remedies.

Title 24, Chapters 1 and 2 (Nuisances) - These Ordinances provides for abatement of nuisances, including litter, industrial wastes, sewage, etc. from any area lake, basin, public park, alley, highway or street through enforcement actions including total cost recovery to the City of Tulsa from the any person, firm corporation, partnership, or other legal entity who commits or who permits the creation or continuation of a nuisance.

Title 42, Chapter 11 (Planned Unit Development) – This ordinance encourages innovative land development while maintaining appropriate limitation on the character and intensity of use and assuring compatibility with adjoining and proximate properties. It also promotes greater flexibility within the development to best utilize the unique physical features of a particular site. Creative land use design and open space preservation are also promoted in this Ordinance. Further, the final purpose of this Ordinance is to achieve a continuity of function and design within the development.

Section 2

Proposed Changes to the Stormwater Management Program

The City of Tulsa is currently in the process of negotiating a renewal of Permit OKS000201. The permit changes the City of Tulsa is recommending are aimed at improving the performance of the Stormwater Management Program. Any changes made in the requirements of the permit during the negotiation process will be incorporated into the SWMP within the timeframe requirement of the final permit.

Section 3

Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under OAC 252.606-1-3(b)(3)(L) adopting and incorporating by reference 40 CFR 122.26(d)(2)(iv) and (d)(2)(v)

No revisions to the “Controls” have been made during this reporting period.

Section 4

A Summary of the Data/Monitoring Data Accumulated Throughout the Reporting Year

To comply with the permit, individual programs were created or adopted and then implemented. Implementation resulted in the creation of databases that track dry weather field screening and floatables monitoring. Data was collected during this reporting period, reviewed for accuracy and completeness and then entered into specific databases. Each program is explained in the following paragraphs along with associated data.

Dry Weather Field Screening

Dry weather field screening was continued during this reporting period in an ongoing effort to detect the presence of illicit connections and improper disposal. One hundred thirteen outfalls were screened, covering approximately 32,557 acres (51.45 square miles). Of the 113 outfalls screened, 37 contained dry weather flow. Once dry weather flow was located, the flow was sampled and tested for pH, temperature, appearance, conductivity, detergents, chlorine, copper, ammonia and fluoride. If contaminants were identified in concentrations above action levels, then dry weather flow follow-up activities were implemented. Dry weather flow follow-up procedures continued until the source was identified. When an illicit discharge was identified, it was eliminated. Specific numbers for this reporting period are as follows:

Total # of outfalls screened	**113**
Total area screened	32,557 acres 51.45 sq. mi.
# of outfalls that did not require follow-up (without flow)	76
# of outfalls with dry weather flows not requiring follow-up (flows present but pollutant concentration below action levels)	26
# of outfalls requiring dry weather flow follow-up (flow with concentrations of pollutants above the action levels)	11

Floatable Monitoring Summary

Data was obtained from five floatable monitoring locations Inspections were performed after rainfall events (> 0.1 in.) during this reporting period. If floatables were present during an inspection, they were collected and data was gathered regarding the quantity in cubic yards and make-up in percent (organic and inorganic). A summary of the data is as follows:

Floatables Monitoring Summary

Station: Sheridan Park,10400 South 67th East Avenue

Date	Floatables Present	Collection (Cubic Yards)	% Organic	% Inorganic
8/9/2022	yes	0.5	80%	20%
10/10/2022	yes	0.25	100%	0%
10/24/2022	yes	1	90%	10%
11/4/2022	yes	1	100%	0%
12/7/2022	yes	0.5	100%	0%
1/2/2023	yes	0.25	90%	10%
1/18/2023	yes	0.25	100%	0%
2/7/2023	yes	0.25	100%	0%
2/14/2023	yes	0.25	100%	0%
2/22/2023	yes	1.25	90%	10%
3/3/2023	no	0		
3/16/2023	yes	0.75	80%	20%
3/21/2023	yes	0.25	100%	0%
5/4/2023	yes	0.5	80%	20%
5/13/2023	yes	0.5	0%	10%
5/19/2023	no	0		
5/24/2023	no	0		
Total Cubic Yard		7.5		
Average Floatable Makeup%			86%	14%

Floatables Monitoring Summary

Station: Osage Detention, 1101 West Pine Street

Date	Floatables Present	Collection (Cubic Yards)	% Organic	% Inorganic
7/29/22	yes	0.5	70%	30%
8/9/22	yes	0.25	100%	0%
10/10/2022	yes	0.25	100%	0%
11/8/2022	yes	0.25	100%	0%
12/7/2022	yes	0.25	100%	0%
12/13/2022	yes	0.75	100%	0%
1/2/2023	yes	0.5	100%	0%
1/18/2023	yes	0.5	80%	20%
1/30/2023	no	0		
2/7/2023	yes	0.25	80%	20%
2/14/2023	yes	0.25	20%	80%
2/22/2023	no	0		
3/16/2023	no	0		
3/21/2023	no	0		
4/25/2023	no	0		
4//27/2023	yes	1	60%	40%
5/4/2023	no	0		
5/24/2023	yes	0.25	90%	10%
6/6/2023	no	0		
6/11/2023	yes	1	90%	10%
Total Cubic Yard		6		
Average Floatable Makeup%			84%	16%

Floatables Monitoring Summary

Station: Vensel Creek 11100 S. Yale Ave.

Date	Floatables Present	Collection (Cubic Yards)	% Organic	% Inorganic
7/29/22	yes	1	100%	0%
8/9/22	yes	0.25	100%	0%
10/10/2022	yes	0.5	90%	10%
10/24/2022	yes	1.5	90%	10%
11/4/2022	yes	1	100%	0%
12/7/2022	-			
1/2/2023	no	0		
1/18/2023	no	0		
1/30/2023	no	0		
2/7/2023	no	0		
2/14/2023	no	0		
2/22/2023	no	0		
3/3/2023	no	0		
3/16/2023	yes	0.75	80%	20%
3/21/2023	yes	1	100%	0%
5/4/2023	yes	1	100%	0%
5/13/2023	yes	1.25	90%	10%
5/19/2023	no	0		
5/24/2023	no	0		
Total Cubic Yard		8.25		
Average Floatable Makeup			94%	6%

Floatables Monitoring Summary

Station: Reed Park 4200 S. Union Ave.

Date	Floatables Present	Collection (Cubic Yards)	% Organic	% Inorganic
7/29/22	no	0		
8/9/22	no	0		
10/10/2022	no	0		
11/8/2022	no	0		
12/13/2022	yes	1	100%	0%
1/2/2023	yes	9	100%	0%
1/18/2023	no	0		
1/30/2023	no	0		
2/7/2023	no	0		
2/14/2023	no	0		
2/22/2023	no	0		
3/16/2023	no	0		
3/21/2023	no	0		
4/25/2023	no	0		
4/27/2023	no	0		
5/4/2023	no	0		
5/24/2023	yes	0.25	100%	0%
6/6/2023	no	0		
6/11/2023	yes	0.25	100%	0%
Total Cubic Yard		10.5		
Average Floatable Makeup			100%	0%

Floatables Monitoring Summary

Station: 4800 W. 8th St.

Date	Floatables Present	Collection (Cubic Yards)	% Organic	% Inorganic
7/29/2022	yes	0.5	90%	10%
8/9/2022	yes	0.25	90%	10%
10/10/2022	yes	0.25	80%	20%
11/8/2022	yes	0.25	90%	10%
12/7/2022	no	0		
12/13/2022	yes	0.5	100%	0%
1/2/2023	yes	0.75	100%	0%
1/18/2023	yes	0.25	50%	50%
1/30/2023	no	0		
2/7/2023	yes	0.5	80%	20%
2/14/2023	yes	0.25	80%	20%
2/22/2023	yes	0.25	0%	100%
3/16/2023	yes	0.5	100%	0%
3/21/2023	no	0		
4/25/2023	no	0		
4/27/2023	yes	1	70%	30%
5/4/2023	yes	10	100%	0%
5/24/2023	yes	0.5	100%	0%
6/6/2023	no	0		
6/11/2023	yes	0.25	80%	20%
Total Cubic Yard		16		
Average Floatable Makeup			81%	19%

Watershed Characterization - Stream Monitoring Reports

CITY OF TULSA
WATERSHED CHARACTERIZATION PROGRAM

Comprehensive Watershed Characterization Assessment Year 2 (2022-2023):

City of Tulsa Public Works
Stormwater Maintenance and Operations
4502 South Galveston
Tulsa, OK 74107

Prepared by

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Senior Environmental Monitoring Technician
Watershed Characterization Project

October 13, 2023

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1.0 INTRODUCTION

1.1 Objective

The purpose of this document is to serve as a comprehensive report of results from the biological, habitat, and analytical assessments of Ford Creek, Fred Creek, Fry Ditch Creek, Haikey Creek, Joe Creek, South Park Creek, Spunky Creek and Vensel Creek. These assessments were performed in order to comply with requirements set forth in Part II(A)(13)(12)(b) and (13)(a) and (b) and Part IV(A)(1) and (2) of Oklahoma Pollutant Discharge Elimination System (OPDES) municipal stormwater (MS4) Permit No. OKS000201 for the City of Tulsa, Oklahoma (ODEQ, OPDES Permit OKS000201, 2011). In addition, assessment results are applied to Oklahoma Water Quality Standards. These standards are described in both (ODEQ, 2023a) and (ODEQ, 2023b). While these implementations describe a multitude of surface water quality standards, this document will compare and describe only the standards applicable to the parameters required in the Watershed Characterization Program sub section of the Municipal Separate Storm Sewer System permit (ODEQ, OPDES Permit OKS000201, 2011). All remaining parameter results without applicable water quality standards will still be included in this report.

The data presented in this comprehensive report was collected over a one-year period beginning in July of 2022 with completion in June of 2023 except for benthic macroinvertebrate data which requires a minimum of four sampling events within a two-year period. Field collection and assessment methodology followed project standard operating procedures (SOPs) as provided in the quality assurance project plans (QAPPs) for the biological component (CCRC & FTN, 2023) and the analytical component (CCRC & FTN, 2023). These QAPPs provide quality assurance and quality control procedures for all aspects of the watershed characterization program. They were submitted to and received approval from the Oklahoma Department of Environmental Quality as per MS4 permit requirements. All field data sheets were scanned electronically and archived at the City of Tulsa Stormwater Maintenance and Operations. All field measurements (in situ measurements, flows, observations), biological information (taxonomic identification, organism counts), and analytical results were compiled in Excel spreadsheets and verified (data entry, formula calculations) per project QA/QC procedures (CCRC & FTN, 2023) (CCRC & FTN, 2023). All raw data, SOPs, and QAPPs are available upon request.

Waterbody	WBID	Latitude	Longitude	Watershed Area (mi^2)	Ecoregion
Ford Creek	OK121300 Not Listed	36.088611	-95.848889	2.64	Central Irregular Plains
Fred Creek	OK120420010060_00	36.053889	-95.942222	2.87	Central Irregular Plains
Fry Ditch Creek	OK120420010020_00	36.015833	-95.891944	10.10	Central Irregular Plains
Haikey Creek	OK120410010210_00	36.021111	-95.860556	8.50	Central Irregular Plains
Joe Creek	OK120420010050_00	36.059167	-95.967222	8.38	Central Irregular Plains
South Park Creek	OK121300 Not Listed	36.095833	-95.841389	1.13	Central Irregular Plains
Spunky Creek	OK121500020480_00	36.161667	-95.745833	11.93	Central Irregular Plains
Vensel Creek	OK120420 Not Listed	36.029444	-95.940556	4.70	Central Irregular Plains

Table 1 - Sampling sites and locations

Photograph of the sample location at Spunky Creek

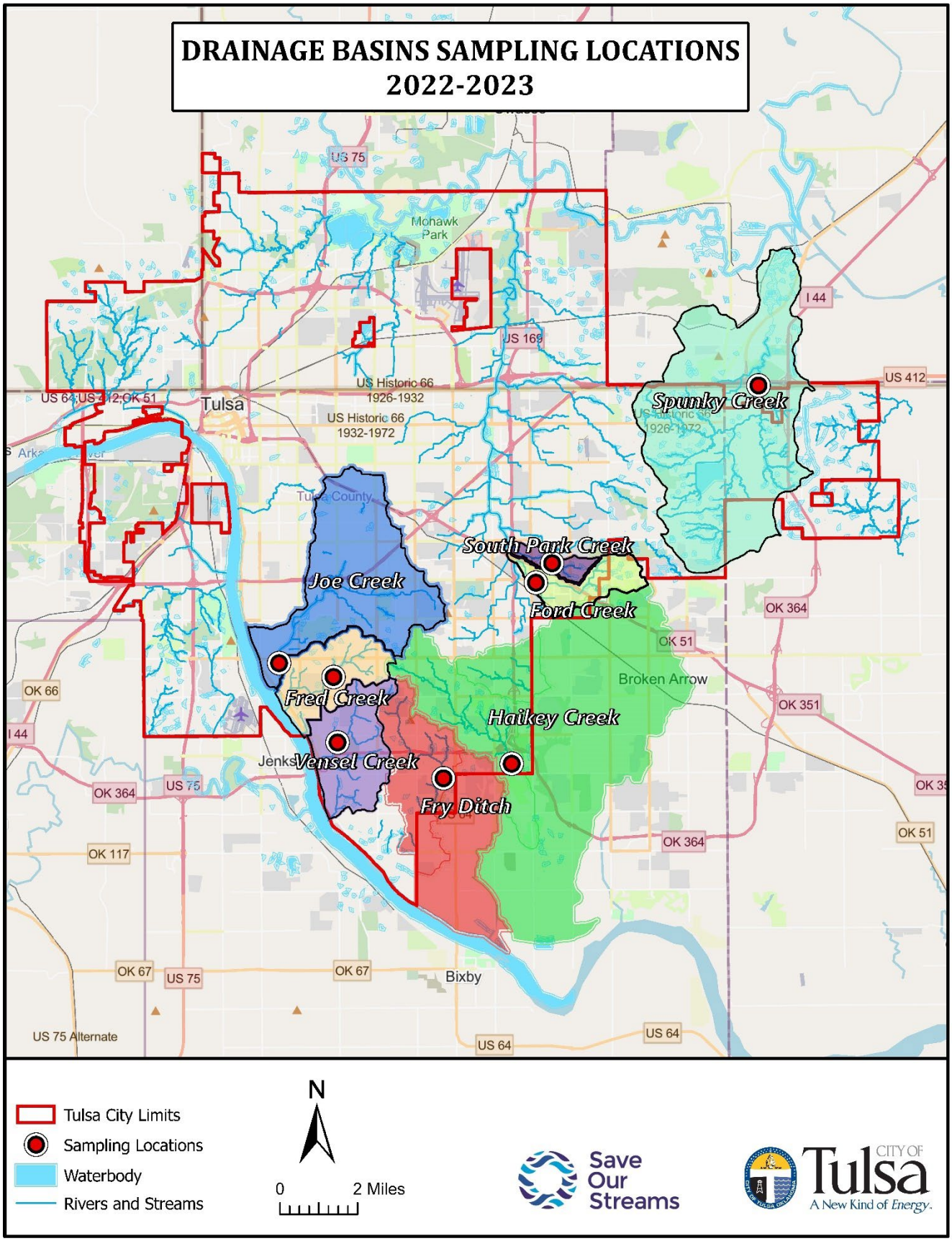

Figure 1 – City of Tulsa watershed map

2.0 BENEFICIAL USES

2.1 Agriculture

2.1.1 Total Dissolved Solids - Data collected on Total Dissolved Solids for the following streams indicates attainment of the agricultural beneficial use. Water quality standards require ten samples. The number of samples collected exceeds the number of samples required by water quality standards. If the sample mean is less than the yearly mean standard, and not more than 10% of samples exceed the sample standard, then the beneficial use is supported.

Waterbody	Sample Mean (mg/L)	Single Sample (mg/L)	Water Quality Standard (mg/L)
Spunky Creek	348	453	Sample: 456, Yearly: 350
Ford Creek	326	414	Sample: 470, Yearly: 387
South Park Creek	629	1880	
Haikey Creek	322	440	Sample: 1782, Yearly: 1419
Fred Creek	385	547	Sample: 1868, Yearly: 1496
Fry Ditch Creek	368	560	
Joe Creek	277	342	
Vensel Creek	352	468	

Table 2 – Total Dissolved Solids standards

Photograph of the sample location at Haikey Creek

2.2 Fish and Wildlife Propagation:

2.2.1 Dissolved Oxygen - Data collected on Dissolved Oxygen concentrations show that the beneficial use is undetermined or not supported for three of the seven streams. Water quality standards require ten samples. The number of samples collected exceeds the number of samples required. The Warm Water Aquatic Community (WWAC) subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be fully supported with respect to the DO criterion if 10% or less of the samples from the stream are less than 6.0 mg/L from April 1 through June 15 and less than 5.0 mg/L during the remainder of the year. Streams marked with an asterisk have no flow or very little flow which may result in low dissolved oxygen concentrations.

Waterbody	Sample Mean (mg/L)	% of samples in exceedance	Water Quality Standard (mg/L)
Ford Creek*	9.23	25%	April 1 – June 15: 6.0 June 16 – March 30: 5.0
Fred Creek*	7.75	17%	
Fry Ditch Creek	8.76	25%	
Haikey Creek	8.74	17%	
Joe Creek	7.73	25%	
South Park Creek*	5.90	50%	
Spunky Creek	8.05	25%	
Vensel Creek	8.89	0%	

Table 3 – Dissolved Oxygen standards

Photograph of YSI Professional Pro multi parameter field meter

2.2.2 Toxicants/Metals - Data collected indicate full support of the beneficial use for Toxicants and Metals for all streams. Five samples are required for water quality standards. The number of samples collected exceeds the number of samples required. Water quality standards are met if no more than one sample exceeds the acute standard and no more than 10% of samples exceeds the chronic standard.

Waterbody	Parameter	Sample Mean (µg/L)	Single Sample (µg/L)	Water Quality Standard (µg/L)
Ford Creek	Cadmium	0.50	0.50	Cd - Acute: 54.43, Chronic: 1.58 Cu - Acute: 28.65, Chronic: 18.40 Pb - Acute: 140.29, Chronic: 5.46 Zn - Acute: 167.79, Chronic: 151.97
	Copper	1.38	1.96	
	Lead	0.50	0.50	
	Zinc	11.79	31.50	
South Park Creek	Cadmium	0.50	0.50	
	Copper	1.67	2.46	
	Lead	0.59	1.63	
	Zinc	10.96	20.90	
Spunky Creek	Cadmium	0.50	0.50	Cd – Acute: 58.21, Chronic: 1.66 Cu – Acute: 30.31, Chronic: 19.36 Pb – Acute: 151.33, Chronic: 5.90 Zn – Acute: 176.46, Chronic: 159.83
	Copper	1.90	2.81	
	Lead	0.52	0.68	
	Zinc	10.00	10.00	
Haikey Creek	Cadmium	0.50	0.50	Cd - Acute: 99.85, Chronic: 2.42 Cu - Acute: 47.56, Chronic: 29.14 Pb - Acute: 278.25, Chronic: 10.84 Zn - Acute: 264.66, Chronic: 239.72
	Copper	1.89	3.45	
	Lead	0.59	1.62	
	Zinc	10.41	14.90	
Fred Creek	Cadmium	0.50	0.50	Cd - Acute: 102.36, Chronic: 2.45 Cu - Acute: 48.56, Chronic: 29.69 Pb - Acute: 286.15, Chronic: 11.15 Zn - Acute: 269.64, Chronic: 244.23
	Copper	1.30	2.66	
	Lead	0.50	0.50	
	Zinc	10.00	10.00	
Fry Ditch Creek	Cadmium	0.50	0.50	
	Copper	1.29	3.72	
	Lead	0.50	0.50	
	Zinc	10.24	12.90	
Joe Creek	Cadmium	0.50	0.50	
	Copper	1.90	4.12	
	Lead	0.53	0.84	
	Zinc	10.21	11.10	
Vensel Creek	Cadmium	0.50	0.50	
	Copper	1.84	4.10	
	Lead	0.63	1.98	
	Zinc	10.23	12.80	

Table 4 – Toxicants/Metals standards

2.2.3 pH (Hydrogen Ion Activity) - Data collected on pH readings show full support of the beneficial use for all streams. Water quality standards require ten samples. The number of pH measurements taken exceeds the number of required measurements. All pH measurements fell within the standard range. Water quality standards are met if no more than 10% of samples are outside the standard range: 6.5 – 9.0 s.u.

Waterbody	Sample Range (s.u)	Water Quality Standard Range (s.u)
Ford Creek	7.5 – 9.0	6.5 – 9.0
Fred Creek	7.4 – 8.0	
Fry Ditch Creek	7.4 – 7.8	
Haikey Creek	7.6 – 8.0	
Joe Creek	7.3 – 7.8	
South Park Creek	7.5 – 8.1	
Spunky Creek	7.6 – 8.1	
Vensel Creek	7.3 – 7.7	

Table 5 – pH standards

2.2.4 Oil and Grease - Oil and Grease is based on visual assessment. No more than 10% of observations can show the occurrence of an oily sheen or oil/grease deposits. Visual observations do not indicate the presence of Oil and Grease pollution, supporting the beneficial use in all streams.

2.2.5 Suspended and Embedded Sediments - Using habitat assessment data to determine support of the beneficial use is conditional upon the support of turbidity data and fish collection data.

2.2.5.1 Turbidity – Data collected on Turbidity readings show full support of the beneficial use. Water quality standards are met when no more than 10% of samples exceed the sample standard. The number of samples collected exceeds the number of samples required.

Waterbody	Sample Mean (NTU)	% of samples in exceedance	Water Quality Standard (NTU)
Ford Creek	11.42	0%	50
Fred Creek	2.25	0%	
Fry Ditch Creek	5.83	0%	
Haikey Creek	9.28	8%	
Joe Creek	4.29	0%	
South Park Creek	9.92	0%	
Spunky Creek	9.21	0%	
Vensel Creek	14.57	8%	

Table 6 – Turbidity standards

2.2.5.2 Habitat Assessment - The resulting score of the habitat assessment on the streams can be compared to the average score of high quality sites within the same ecoregion provided by the Oklahoma Conservation Commission using a scoring workbook derived from OWRB (OWRB, 2001). All the creeks for this sampling year are in the Central Irregular Plains ecoregion. The habitat assessment for Fry Ditch Creek was unable to be completed due to a construction project in the creek.

Waterbody	Instream Habitat	Pool Bottom Substrate	Pool Variability	Canopy Cover	Presence of Rocky Runs and Riffles	Flow	Channel Alteration	Channel Sinuosity	Bank Stability	Bank Vegetation Stability	Streamside Cover	Total Score	Mean Score
Ford Creek	17.9	6.7	11.3	17.5	11.4	1.3	12.3	0.2	8.3	5.9	3.4	96.2	84.1
Fred Creek	11.9	9.7	0.0	4.6	2.2	1.3	12.3	0.8	5.3	10.0	10.0	68.1	
Fry Ditch Creek	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Haikey Creek	19.6	4.6	0.0	14.7	0.0	3.4	16.5	0.5	4.0	1.0	10.0	74.3	
Joe Creek	18.2	10.9	13.4	14.0	7.5	12.5	16.5	0.3	6.4	10.0	10.0	119.7	
South Park Creek	16.0	5.2	18.8	15.9	0.0	0.0	11.1	1.4	8.4	8.8	9.7	95.3	
Spunky Creek	18.4	6.7	13.3	19.6	12.4	15.3	13.7	2.4	5.8	3.2	10.0	120.8	
Vensel Creek	17.3	1.6	18.1	20.0	7.5	2.3	11.1	1.3	4.8	2.5	9.9	96.4	

Table 7 – Habitat assessment metric and total results with ecoregion mean score

Photograph of a habitat assessment

2.2.6 Biological

2.2.6.1 Fish Collections – Below is the data recorded from fish collections performed on the streams. The fish collection for Fry Ditch Creek was unable to be completed due to a construction project in the creek and will be scheduled for the following year.

Waterbody	Sample Composition	Fish Condition	Total Score	Score Key
Ford Creek	12	13	25	30+ Beneficial Use Supported; 23 – 29 Undetermined; <22 Impaired
Fred Creek	10	11	21	
Fry Ditch Creek	N/A	N/A	N/A	
Haikey Creek	16	11	27	
Joe Creek	20	11	31	
South Park Creek	16	11	27	
Spunky Creek	20	13	33	
Vensel Creek	10	11	21	

Table 8 – Fish IBI scores

Photograph of a redear sunfish

2.2.6.2 Benthic Macroinvertebrate Collections – Below is the data recorded from benthic macroinvertebrate collections during the summer and winter index periods and the final macroinvertebrate status (ODEQ, Continuing Planning Process, 2012).

Waterbody	Summer 2021 Score	Winter 2022 Score	Summer 2022 Score	Winter 2023 Score	Final Macroinvertebrate Assessment
Ford Creek	77%	44%	45%	67%	Not Attaining
Fred Creek	71%	44%	58%	74%	Undetermined
Fry Ditch Creek	45%	59%	52%	59%	Undetermined
Haikey Creek	58%	44%	52%	30%	Not Attaining
Joe Creek	52%	52%	84%	89%	Attaining
South Park Creek	48%	56%	41%	64%	Not Attaining
Spunky Creek	77%	52%	52%	96%	Undetermined
Vensel Creek	52%	44%	58%	67%	Undetermined
>80% Attaining: 80 – 50% Undetermined: <50% Not Attaining					

Table 9 – Benthic macroinvertebrate metrics for summer and winter index periods and final assessment

Photograph of mayfly larvae

2.3 Primary Body Contact – Below is the data collected on *E. coli* and *Enterococcus* concentrations. Water quality standards require 10 samples. The number of samples collected exceeds the number of samples required. The monitoring period to support this beneficial use is May 1 through Sept 30. Water quality standards are met when the geometric mean does not exceed the standard. The non-recreational geometric mean is not a water quality standard but is recommended to be five times the recreational geometric mean for both *E. coli* and *Enterococcus*.

Waterbody	*E. coli* Recreation Sample Geometric Mean (MPN/100mL)	*E. coli* Non-Recreation Sample Geometric Mean (MPN/100mL)	Single Sample (MPN/100mL)	Water Quality Standard (MPN/100mL)
Ford Creek	80	32	550	Recreational Period Geometric Mean: 126; Non-recreational Period Geometric Mean: 630
Fred Creek	66	50	5900	
Fry Ditch Creek	318	59	2400	
Haikey Creek	234	69	5000	
Joe Creek	294	192	46000	
South Park Creek	172	47	870	
Spunky Creek	87	39	2400	
Vensel Creek	1055	408	19000	

Table 10 – *E. coli* totals

Waterbody	*Enterococcus* Recreation Sample Geometric Mean (MPN/100mL)	*Enterococcus* Non-Recreation Sample Geometric Mean (MPN/100mL)	Single Sample (MPN/100mL)	Water Quality Standard (MPN/100mL)
Ford Creek	20	34	120	Recreational Period Geometric Mean: 33; Non-recreational Period Geometric Mean: 165
Fred Creek	214	32	2400	
Fry Ditch Creek	623	36	2420	
Haikey Creek	484	33	12000	
Joe Creek	183	114	2420	
South Park Creek	304	68	2420	
Spunky Creek	134	21	2000	
Vensel Creek	676	310	2420	

Table 11 – *Enterococcus* totals

2.4 Anti-Degradation Policy

2.4.1 Nutrients - Analytical results for Total Phosphorus and Nitrate/Nitrite show no need for further investigation to show support of the beneficial except for Spunky Creek. Water quality standards requires 10 samples. The number of samples collected exceeds the number of required samples. Water quality standards are met if no more than 10% of samples are out of range. While Nitrate/Nitrite concentrations have an action level, it is not a required parameter within the MS4 permit (ODEQ, OPDES Permit OKS000201, 2011).

Waterbody	Total Phosphorus Sample Mean (mg/L)	Nitrite - Nitrate Sample Mean (mg/L)	% of samples in exceedance	Water Quality Threshold (mg/L)
Ford Creek	0.04	0.25	0%	Total Phosphorus: 0.24 Nitrate/Nitrite: 4.95
Fred Creek	0.03	0.34	0%	
Fry Ditch Creek	0.05	0.59	0%	
Haikey Creek	0.04	0.41	0%	
Joe Creek	0.05	0.46	0%	
South Park Creek	0.08	0.52	0%	
Spunky Creek	0.40	0.75	75%	
Vensel Creek	0.06	0.43	0%	

Table 12 – Nutrient totals

3.0 SUMMARY

The attainment of the agricultural beneficial use for South Park Creek was not met and did not meet the attainment of the agricultural beneficial use in the previous sampling period for South Park Creek. All the creeks were impaired for dissolved oxygen except for Vensel Creek. A few of the creeks have no/low flows for a portion of the sampling year or sometimes for the entire year. South Park Creek has no flow year-round and has low dissolved oxygen on a consistent basis. Most of the creeks have low D.O. readings during the summer months due to extreme heat. Fred Creek and Haikey Creek both had little variation in depth lowering the metric score for pool variability as well as low sinuosity resulting in a lower than average habitat assessment score. Fish collection scores show impairment for Fred Creek and Vensel Creek. Benthic macroinvertebrate collections indicate that Ford Creek, Haikey Creek and South Park Creek are impaired for two or more of the index periods. These streams had very few taxa from the EPT orders and very few individuals from the EPT orders that were present. Fry Ditch Creek, Haikey Creek, Joe Creek, South Park Creek and Vensel Creek exceeded the geometric mean for *E. coli* and all streams except for Ford Creek exceeded the geometric mean for *Enterococcus* for recreational period sampling. Spunky Creek was the only creek that exceeded the water quality threshold for total phosphorus and has been an ongoing problem for the stream due to a failing wastewater treatment plant outside the city limits of Tulsa.

ANALYTE	Ford Creek											
	7/12/22	8/8/22	9/19/22	10/6/22	11/21/22	12/7/22	1/5/23	2/20/23	3/20/23	4/17/23	5/3/23	6/1/23
BOD (5) Day (BDL 3) mg/L	3.0	3.6	3.0	4.0	3.0	3.0	3.0	3.0	3.9	3.0	3.0	3.0
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	687	455	501	529	328	388	371	382	348	499	419	594
Copper, Total (BDL 0.5) µg/L	0.93	1.72	1.32	1.30	1.00	1.45	1.40	1.60	1.96	1.22	1.41	1.27
Dissolved Oxygen mg/L	4.06	12.01	3.24	3.09	11.98	10.49	12.76	12.38	13.44	9.00	9.52	8.80
Flow CFS	0.00	0.00	0.00	0.00	0.00	0.00	0.43	1.28	0.99	0.08	0.34	0.12
Hardness, Total (BDL 3.6) mg/L	180	140	180	200	230	210	240	210	230	210	190	190
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.57	0.66	0.69	0.53	0.50	0.50	0.86	0.50	1.02	0.51	0.50	0.70
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.61	0.34	0.20	0.20	0.20
Nitrogen, Total as N (BDL 0.5) mg/L	0.57	0.66	0.69	0.53	0.50	0.50	0.86	0.61	1.36	0.51	0.50	0.70
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	23	20	20	20	20	20	20	20	20
pH (s.u.)	7.76	8.33	7.69	7.54	8.16	7.89	8.03	7.77	8.98	7.97	8.07	8.11
Phosphorus, Total (BDL 0.010) mg/L	0.019	0.020	0.012	0.061	0.015	0.031	0.095	0.034	0.035	0.017	0.027	0.160
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.016	0.013	0.010	0.031	0.010	0.014	0.010	0.020	0.010	0.011	0.015	0.100
Solids, Total Dissolved (BDL 10) mg/L	414	249	296	344	322	312	360	327	330	330	309	317
Solids, Total Suspended (BDL 2.0) mg/L	4.8	3.2	2.7	35.0	8.0	15.0	23.0	22.0	17.0	2.4	11.0	5.2
Temperature, Water °C	25.9	27.2	23.7	18.4	4.0	9.2	4.8	9.4	7.2	15.4	18.1	27.8
Turbidity (NTU)	2.34	1.17	1.36	27.40	6.08	19.40	23.80	20.20	17.20	3.57	10.70	3.77
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	31.50	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

Table 13 – Complete analytical sampling results for all parameters for Ford Creek

ANALYTE	Ford Creek																	
	7/12/22	8/8/22	8/11/22	8/22/22	9/19/22	9/21/22	10/6/22	11/21/22	12/7/22	1/5/23	2/20/23	3/20/23	4/17/23	5/3/23	5/8/23	5/18/23	5/23/23	6/1/23	6/7/23
E. coli MPN/100mL	9	550	55	79	210	13	10	91	61	22	50	17	32	78	91	47	100	280	120
Enterococcus MPN/100mL	5	17	2	3	27	7	8	24	98	18	120	39	31	36	74	38	98	61	70
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 14 – Complete analytical results for bacteria samples for Ford Creek

ANALYTE	Fred Creek											
	7/11/22	8/10/22	9/14/22	10/5/22	11/9/22	12/19/22	1/4/23	2/6/23	3/14/23	4/10/23	5/2/23	6/7/23
BOD (5) Day (BDL 3) mg/L	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	587	589	476	479	389	416	494	642	505	594	641	582
Copper, Total (BDL 0.5) µg/L	1.10	1.29	0.71	0.76	1.58	1.08	1.10	1.51	1.22	1.21	1.34	2.66
Dissolved Oxygen mg/L	5.36	6.52	6.64	8.61	4.83	10.87	8.00	10.88	11.22	8.86	7.64	3.56
Flow CFS	0.00	0.00	0.00	0.00	0.00	0.25	0.32	0.32	0.75	0.45	0.64	0.32
Hardness, Total (BDL 3.6) mg/L	220	200	200	200	180	260	240	240	290	270	280	220
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.50	0.50	4.22	2.78	0.82	0.50	0.69	0.64	0.50	0.50	0.59	0.50
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.20	0.20	0.20	0.70	0.20	0.23	1.10	0.20	0.34	0.35
Nitrogen, Total as N (BDL 0.5) mg/L	0.50	0.50	4.22	2.78	0.82	0.70	0.69	0.87	1.10	0.50	0.93	0.50
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	20	20	20	20	20	20	20	20	20
pH (s.u.)	7.87	7.96	7.59	8.02	7.43	7.70	7.58	7.57	7.73	7.64	7.53	7.48
Phosphorus, Total (BDL 0.010) mg/L	0.022	0.032	0.017	0.013	0.030	0.040	0.035	0.027	0.022	0.016	0.043	0.028
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.017	0.019	0.020	0.012	0.010	0.023	0.019	0.019	0.015	0.012	0.027	0.021
Solids, Total Dissolved (BDL 10) mg/L	342	312	322	313	266	472	403	547	443	394	463	346
Solids, Total Suspended (BDL 2.0) mg/L	2.5	4.0	9.3	3.5	3.2	3.5	4.8	4.0	8.0	5.3	3.0	3.6
Temperature, Water °C	26.9	27.8	21.0	19.4	17.6	5.6	7.8	7.5	8.1	16.1	15.3	23.7
Turbidity (NTU)	3.20	5.96	1.10	1.10	1.22	1.79	3.09	2.04	2.94	0.97	1.57	1.96
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

Table 15 – Complete analytical sampling results for all parameters for Fred Creek

ANALYTE	Fred Creek																	
	7/11/22	8/10/22	8/11/22	8/22/22	9/14/22	9/21/22	10/5/22	11/9/22	12/19/22	1/4/23	2/6/23	3/14/23	4/10/23	5/2/23	5/8/23	5/18/23	5/23/23	6/7/23	6/7/23
E. coli MPN/100mL	33	84	24	17	82	29	9	69	220	2	13	36	5900	51	31	260	180	240	140
Enterococcus MPN/100mL	20	440	520	93	32	84	33	96	140	7	7	65	22	110	56	390	580	2400	2400
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 16 – Complete analytical results for bacteria samples for Fred Creek

ANALYTE	Fry Ditch Creek											
	7/13/22	8/9/22	9/22/22	10/19/22	11/16/22	12/21/22	1/9/23	2/13/23	3/15/23	4/11/23	5/8/23	6/14/23
BOD (5) Day (BDL 3) mg/L	3.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	8.0	3.0	3.0
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	652	496	762	397	273	359	397	438	452	572	606	486
Copper, Total (BDL 0.5) µg/L	0.82	3.72	0.98	1.49	1.59	0.74	0.61	1.06	0.85	0.93	1.26	1.47
Dissolved Oxygen mg/L	5.25	3.32	4.59	8.11	11.81	12.41	12.29	13.20	12.84	7.84	8.04	5.36
Flow CFS	0.19	0.95	0.11	0.13	0.58	0.77	0.57	1.28	1.59	1.25	1.29	1.08
Hardness, Total (BDL 3.6) mg/L	230	170	310	220	170	220	250	260	260	250	230	180
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	1.94	1.00	0.82	0.69	0.51	0.54	0.65	0.63	0.50	0.50	0.57	0.84
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.52	0.56	0.97	0.64	0.43	0.89	0.39	0.87	0.76	0.34	0.41	0.26
Nitrogen, Total as N (BDL 0.5) mg/L	2.46	1.56	1.79	1.33	0.94	1.43	1.04	1.50	0.76	0.50	0.98	1.10
Oxygen Demand, Chemical (BDL 20) mg/L	20	33	20	21	20	20	20	20	20	20	21	23
pH (s.u.)	7.45	7.39	7.43	7.60	7.66	7.59	7.62	7.80	7.79	7.59	7.70	7.49
Phosphorus, Total (BDL 0.010) mg/L	0.041	0.089	0.065	0.055	0.037	0.043	0.031	0.057	0.040	0.029	0.055	0.068
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.026	0.059	0.043	0.031	0.024	0.018	0.011	0.016	0.012	0.019	0.038	0.038
Solids, Total Dissolved (BDL 10) mg/L	432	292	560	333	270	308	369	386	416	383	388	277
Solids, Total Suspended (BDL 2.0) mg/L	4.5	11.0	9.5	20.0	5.3	3.6	10.0	20.0	8.0	12.0	9.5	10.0
Temperature, Water °C	24.4	26.2	21.7	8.8	5.2	5.0	4.8	6.7	8.6	16.0	21.6	22.9
Turbidity (NTU)	2.18	9.12	11.30	7.68	5.37	3.59	2.37	7.80	6.33	2.85	4.54	6.86
Zinc, Total (BDL 10) µg/L	10.00	12.90	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

Table 17 – Complete analytical sampling results for all parameters for Fry Ditch Creek

ANALYTE	Fry Ditch Creek																	
	7/13/22	8/9/22	8/11/22	8/22/22	9/21/22	9/22/22	10/19/22	11/16/22	12/21/22	1/9/23	2/13/23	3/15/23	4/11/23	5/8/23	5/8/23	5/18/23	5/23/23	6/7/23	6/14/23
E. coli MPN/100mL	64	1400	200	2400	99	260	1600	160	9	16	53	36	36	110	100	490	220	870	920
Enterococcus MPN/100mL	150	2420	460	2420	2000	1000	820	49	13	4	38	48	20	120	160	580	980	2400	1600
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 18 – Complete analytical results for bacteria samples for Fry Ditch Creek

ANALYTE	Haikey Creek											
	7/18/22	8/9/22	9/21/22	10/18/22	11/22/22	12/21/22	1/5/23	2/13/23	3/15/23	4/11/23	5/8/23	6/14/23
BOD (5) Day (BDL 3) mg/L	3.0	3.0	7.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.5
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	676	477	400	449	285	348	411	403	488	586	498	241
Copper, Total (BDL 0.5) µg/L	1.74	1.84	3.32	2.50	1.60	1.23	1.04	1.55	1.16	1.49	1.76	3.45
Dissolved Oxygen mg/L	2.90	5.13	3.14	6.27	12.49	13.90	13.36	13.17	12.00	8.68	7.25	6.53
Flow CFS	0.00	0.48	0.00	0.00	0.39	0.26	0.27	1.52	2.40	0.62	0.99	1.29
Hardness, Total (BDL 3.6) mg/L	200	150	160	180	180	210	200	230	280	240	180	92
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.62
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.50	0.50	1.51	0.71	0.50	0.65	0.69	0.57	0.50	0.50	1.60	0.89
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.22	0.20	0.22	0.20	0.63	0.20	1.10	1.10	0.20	0.42	0.28
Nitrogen, Total as N (BDL 0.5) mg/L	0.50	0.72	1.51	0.93	0.50	1.28	0.69	1.67	1.10	0.50	2.02	1.17
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	160	20	20	20	20	20	20	20	27
pH (s.u.)	7.67	7.79	7.56	7.62	7.72	7.97	7.87	7.89	7.93	7.78	7.79	7.55
Phosphorus, Total (BDL 0.010) mg/L	0.045	0.035	0.030	0.052	0.029	0.032	0.023	0.042	0.032	0.014	0.053	0.136
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.035	0.019	0.014	0.031	0.014	0.015	0.010	0.022	0.014	0.011	0.036	0.036
Solids, Total Dissolved (BDL 10) mg/L	411	255	231	334	275	336	373	351	440	389	307	163
Solids, Total Suspended (BDL 2.0) mg/L	9.0	10.0	6.6	3.3	3.3	3.8	3.0	10.0	8.8	2.9	10.0	50.0
Temperature, Water °C	25.9	26.5	23.1	10.5	4.1	4.3	4.9	5.9	8.2	15.8	21.6	22.0
Turbidity (NTU)	4.64	8.43	9.07	4.20	3.99	3.73	3.25	6.48	4.72	2.38	5.59	54.90
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	14.90
Results found to be below the detection limit are reported as the detection limit												

Table 19 – Complete analytical sampling results for all parameters for Haikey Creek

ANALYTE	Haikey Creek																	
	7/18/22	8/9/22	8/11/22	8/22/22	9/21/22	9/21/22	10/18/22	11/22/22	12/21/22	1/5/23	2/13/23	3/15/23	4/11/23	5/8/23	5/8/23	5/18/23	5/23/23	6/7/23	6/14/23
E. coli MPN/100mL	96	210	190	26	2400	30	150	34	65	30	77	88	110	130	140	230	440	410	5000
Enterococcus MPN/100mL	1600	820	440	330	770	86	160	28	14	6	64	47	40	130	230	110	550	600	12000
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 20 – Complete analytical results for bacteria samples for Haikey Creek

ANALYTE	Joe Creek											
	7/14/22	8/11/22	9/21/22	10/18/22	11/17/22	12/15/22	1/10/23	2/16/23	3/20/23	4/12/23	5/18/23	6/8/23
BOD (5) Day (BDL 3) mg/L	4.9	3.0	3.0	3.0	3.0	9.0	3.0	3.0	3.0	3.0	3.0	8.3
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	639	589	541	322	236	289	301	255	377	547	518	249
Copper, Total (BDL 0.5) µg/L	2.02	1.39	0.84	1.62	1.47	2.00	1.16	3.03	1.57	1.64	1.94	4.12
Dissolved Oxygen mg/L	5.83	4.82	2.73	5.62	10.72	11.78	12.27	9.99	12.81	7.13	6.52	2.57
Flow CFS	1.50	2.58	1.69	1.42	2.30	4.86	3.76	8.41	4.34	2.48	4.34	4.08
Hardness, Total (BDL 3.6) mg/L	190	190	220	160	170	160	170	130	220	200	180	83
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.84	0.50	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	1.12	0.64	0.64	0.98	0.50	0.50	0.68	0.71	0.71	0.62	1.34	1.86
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.21	0.20	0.23	0.31	0.88	0.36	1.10	0.70	0.35	0.66	0.28
Nitrogen, Total as N (BDL 0.5) mg/L	1.12	0.85	0.64	1.21	0.50	0.88	1.04	1.81	1.41	0.97	2.00	2.14
Oxygen Demand, Chemical (BDL 20) mg/L	20	25	20	23	20	53	20	20	20	20	20	34
pH (s.u.)	7.52	7.29	7.29	7.39	7.50	7.61	7.79	7.63	7.72	7.54	7.67	7.49
Phosphorus, Total (BDL 0.010) mg/L	0.080	0.052	0.025	0.045	0.040	0.074	0.023	0.113	0.032	0.028	0.076	0.066
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.049	0.044	0.019	0.026	0.027	0.052	0.010	0.086	0.019	0.027	0.057	0.022
Solids, Total Dissolved (BDL 10) mg/L	333	323	308	224	255	257	265	224	342	338	307	147
Solids, Total Suspended (BDL 2.0) mg/L	21.0	3.6	4.0	8.0	3.0	7.4	2.5	11.0	3.2	3.3	2.0	9.3
Temperature, Water °C	29.1	28.9	25.5	13.4	6.7	6.1	6.9	7.8	6.5	19.5	21.1	26.6
Turbidity (NTU)	4.85	1.46	1.45	3.52	3.45	5.70	2.63	15.00	2.19	2.68	1.59	6.91
Zinc, Total (BDL 10) µg/L	10.70	10.00	10.00	10.00	10.00	10.00	10.00	10.70	10.00	10.00	10.00	11.10
Results found to be below the detection limit are reported as the detection limit												

Table 21 – Complete analytical sampling results for all parameters for Joe Creek

ANALYTE	Joe Creek																	
	7/14/22	8/9/22	8/11/22	8/22/22	9/21/22	9/21/22	10/18/22	11/17/22	12/15/22	1/10/23	2/16/23	3/20/23	4/12/23	5/8/23	5/18/23	5/18/23	5/23/23	6/7/23	6/8/23
E. coli MPN/100mL	41	29	62	46000	22	16	730	210	490	34	460	54	150	59	310	170	99	34000	33000
Enterococcus MPN/100mL	26	330	26	2420	86	68	340	42	270	14	1400	58	56	100	460	180	150	150	2420
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 22 – Complete analytical results for bacteria samples for Joe Creek

ANALYTE	South Park Creek											
	7/13/22	8/15/22	9/19/22	10/6/22	11/21/22	12/19/22	1/11/23	2/15/23	3/20/23	4/17/23	5/16/23	6/26/23
BOD (5) Day (BDL 3) mg/L	3.6	3.0	21.0	7.4	3.0	3.0	4.7	3.0	4.6	4.0	3.2	3.0
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	2316	926	627	640	396	607	824	510	690	903	602	928
Copper, Total (BDL 0.5) µg/L	0.75	2.45	1.87	1.41	2.46	1.18	1.06	2.01	2.17	1.55	1.87	1.29
Dissolved Oxygen mg/L	0.90	1.61	2.89	2.74	7.76	11.23	11.18	8.20	11.89	7.04	2.29	3.12
Flow CFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hardness, Total (BDL 3.6) mg/L	680	230	260	260	230	260	320	210	290	300	170	260
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	1.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.67	1.29	1.25	0.88	1.47	0.50	1.02	0.60	0.50	0.83	0.85	0.95
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.20	0.20	0.21	1.20	0.20	1.80	1.40	0.20	0.20	0.20
Nitrogen, Total as N (BDL 0.5) mg/L	0.67	1.29	1.25	0.88	1.68	1.20	1.02	2.40	1.40	0.83	0.85	0.95
Oxygen Demand, Chemical (BDL 20) mg/L	56	24	35	34	25	20	20	20	20	20	28	31
pH (s.u.)	7.49	7.61	7.80	7.75	7.66	7.72	7.72	7.86	7.89	8.06	7.55	7.78
Phosphorus, Total (BDL 0.010) mg/L	0.093	0.053	0.098	0.094	0.088	0.045	0.059	0.085	0.034	0.062	0.126	0.069
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.041	0.031	0.025	0.029	0.020	0.016	0.022	0.053	0.019	0.018	0.073	0.024
Solids, Total Dissolved (BDL 10) mg/L	1880	454	589	534	397	383	671	424	580	723	344	563
Solids, Total Suspended (BDL 2.0) mg/L	16.0	8.7	13.0	18.0	55.0	7.7	7.7	9.3	8.7	3.2	9.5	5.9
Temperature, Water °C	26.0	28.1	25.3	18.4	2.8	5.5	7.5	7.4	4.8	13.4	20.0	28.1
Turbidity (NTU)	5.09	6.30	4.78	5.73	47.50	5.59	3.98	13.20	5.89	3.96	8.78	8.28
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	10.00	10.00	20.90	10.00	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

Table 23 – Complete analytical sampling results for all parameters for South Park Creek

ANALYTE	South Park Creek																	
	7/13/22	8/11/22	8/15/22	8/22/22	9/19/22	9/21/22	10/6/22	11/21/22	12/19/22	1/11/23	2/15/23	3/20/23	4/17/23	5/8/23	5/16/23	5/18/23	5/23/23	6/7/23	6/26/23
E. coli MPN/100mL	220	47	80	390	29	870	650	40	62	59	86	7	8	36	310	520	820	200	88
Enterococcus MPN/100mL	56	150	33	2000	2420	2420	1000	58	38	60	170	23	13	46	340	330	1300	310	91
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 24 – Complete analytical results for bacteria samples for South Park Creek

ANALYTE	Spunky Creek											
	7/22/22	8/17/22	9/20/22	10/20/22	11/16/22	12/14/22	1/9/23	2/20/23	3/22/23	4/18/23	5/9/23	6/15/23
BOD (5) Day (BDL 3) mg/L	3.6	3.0	3.0	9.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.8
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	554	544	498	407	333	313	359	456	508	603	634	445
Copper, Total (BDL 0.5) µg/L	2.76	2.04	1.65	1.68	1.22	2.81	1.18	1.61	1.57	2.03	2.03	2.17
Dissolved Oxygen mg/L	3.41	3.95	5.14	9.00	11.29	10.14	13.35	11.04	11.00	7.36	4.37	6.57
Flow CFS	0.70	1.39	2.05	1.74	2.49	15.40	2.14	7.66	9.94	4.51	4.38	17.32
Hardness, Total (BDL 3.6) mg/L	180	200	190	180	190	160	220	260	260	270	230	180
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.68	0.50	0.50	0.50	0.50	0.50	0.62
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.86	0.64	0.73	0.69	0.91	0.86	0.80	0.50	0.50	0.71	0.61	0.95
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.55	0.20	0.29	0.85	1.00	1.20	0.74	1.40	1.30	0.20	0.84	0.41
Nitrogen, Total as N (BDL 0.5) mg/L	1.41	0.64	1.02	1.54	1.91	2.06	1.54	1.40	1.30	0.71	1.45	1.36
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	20	20	20	20	20	20	20	21	20
pH (s.u.)	7.72	7.79	7.68	7.85	7.76	7.87	8.12	7.87	7.82	7.96	7.56	7.78
Phosphorus, Total (BDL 0.010) mg/L	0.595	0.515	0.425	0.565	0.612	0.242	0.333	0.189	0.182	0.322	0.555	0.218
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.555	0.481	0.025	0.552	0.580	0.202	0.290	0.162	0.158	0.295	0.530	0.173
Solids, Total Dissolved (BDL 10) mg/L	302	312	281	318	316	272	358	426	453	423	451	267
Solids, Total Suspended (BDL 2.0) mg/L	12.0	8.8	6.4	11.0	4.3	18.0	11.0	9.3	10.0	2.0	23.0	230.0
Temperature, Water °C	27.2	26.6	24.4	9.9	6.5	9.9	4.8	8.3	11.3	16.9	23.3	23.7
Turbidity (NTU)	9.86	8.93	5.54	3.74	2.09	32.00	2.78	6.41	4.65	4.18	8.49	21.90
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

Table 25 – Complete analytical sampling results for all parameters for Spunky Creek

ANALYTE	Spunky Creek																	
	7/21/22	8/11/22	8/17/22	8/22/22	9/20/22	9/21/22	10/20/22	11/16/22	12/14/22	1/9/23	2/20/23	3/22/23	4/18/23	5/8/23	5/9/23	5/18/23	5/23/23	6/7/23	6/15/23
E. coli MPN/100mL	33	54	38	34	72	72	26	7	2400	1	12	390	64	130	130	110	170	370	140
Enterococcus MPN/100mL	120	410	280	390	28	21	3	5	2000	6	21	59	7	140	120	190	310	140	77
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 26 – Complete analytical results for bacteria samples for Spunky Creek

ANALYTE	Vensel Creek											
	7/19/22	8/17/22	9/20/22	10/2022	11/17/22	12/14/22	1/10/23	2/16/23	3/22/23	4/19/23	5/16/23	6/26/23
BOD (5) Day (BDL 3) mg/L	3.0	3.0	3.0	11.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Cadmium, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Conductivity µS	740	641	633	337	310	306	504	260	349	664	442	661
Copper, Total (BDL 0.5) µg/L	2.04	1.38	0.67	1.37	1.01	2.76	0.51	4.10	2.41	1.59	3.27	0.95
Dissolved Oxygen mg/L	5.86	6.35	5.06	7.58	10.81	10.87	13.90	12.92	11.13	7.76	6.81	7.59
Flow CFS	0.27	0.31	0.13	0.08	0.38	0.48	0.12	0.97	0.93	0.33	1.28	0.25
Hardness, Total (BDL 3.6) mg/L	280	260	260	190	230	170	280	130	200	290	180	220
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.98	0.61	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.50	0.50	0.50	0.88	0.50	1.10	0.51	0.80	1.04	0.60	0.81	0.51
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.22	0.29	0.31	1.10	0.20	0.86	0.67	0.26	0.46	0.33
Nitrogen, Total as N (BDL 0.5) mg/L	0.50	0.50	0.50	1.16	0.50	2.20	0.51	1.66	1.71	0.86	1.27	0.84
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	20	20	20	20	20	20	20	20	20
pH (s.u.)	7.52	7.65	7.42	7.32	7.45	7.64	7.56	7.55	7.50	7.57	7.38	7.62
Phosphorus, Total (BDL 0.010) mg/L	0.033	0.031	0.039	0.047	0.052	0.088	0.032	0.138	0.052	0.027	0.080	0.041
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.017	0.019	0.017	0.023	0.014	0.041	0.010	0.033	0.010	0.013	0.043	0.026
Solids, Total Dissolved (BDL 10) mg/L	468	388	379	278	322	274	448	224	291	438	282	435
Solids, Total Suspended (BDL 2.0) mg/L	7.8	2.0	4.6	12.0	9.7	11.0	4.5	40.0	19.0	6.4	11.0	2.8
Temperature, Water °C	25.0	25.1	23.2	10.1	5.8	8.7	7.4	7.3	12.6	18.1	19.4	24.1
Turbidity (NTU)	3.69	2.69	3.38	5.76	10.20	17.70	8.00	76.60	25.50	5.10	11.90	4.31
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	10.00	10.00	10.00	12.80	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

Table 27 – Complete analytical sampling results for all parameters for Vensel Creek

ANALYTE	Vensel Creek																	
	7/19/22	8/11/22	8/17/22	8/22/22	9/20/22	9/21/22	10/22/22	11/17/22	12/14/22	1/10/23	2/16/23	3/22/23	4/19/23	5/8/23	5/16/23	5/18/23	5/23/23	6/7/23	6/26/23
E. coli MPN/100mL	120	170	96	2700	1600	160	650	820	2600	33	920	980	46	200	2400	14000	6900	19000	160
Enterococcus MPN/100mL	870	520	250	2420	180	130	78	64	2420	26	2420	2420	150	550	920	2400	2400	2420	200
Results found to be below the detection limit are reported as the detection limit (BDL 1)																			

Table 28 – Complete analytical results for bacteria samples for Vensel Creek

4.0 REFERENCES

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Follow Up and Response Program

The follow up and response program examines and attempts to eliminate any unlawful source of contamination as evidenced in the results found primarily in the analytical sampling portion of the watershed characterization program in addition to the results of the benthic and fish collections. This includes verifying laboratory procedures in analyzation, duplicate relative percent difference calculations and comparison of results to water quality standards. If a single monthly sample exceeds water quality standard limits, a follow up investigation will take place to determine a potential source. This includes re-sampling, field test kit investigations, and review of sanitary sewer overflows or water line break historical maps.

In the City of Tulsa, most follow-ups were investigations into elevated bacteria results from the monthly single sample. This involved testing for ammonia or detergents as well as reviewing sanitary sewer overflow historical maps to locate sanitary sewer contributions. Many times, especially through the dry summer months, a lack of flow can be the cause. These bacteria investigations yielded few definitive results. South Park Creek was found to have elevated levels of total dissolved solids. Investigation into nearly the entire watershed did not find any specific contributing cause. Waterfowl and lack of flow for the majority of the year could be a contributing factor, but otherwise it seemed to be naturally occurring. In the case of Spunky Creek, multiple elevated total phosphorus and total dissolved solids results triggered an investigation that led to finding contributions from a private wastewater treatment plant to likely be the cause. This discharge was found by re-sampling upstream until the results were below water quality standards. Multiple samples show a difference in concentrations directly above and below the treatment plant outfall.

Microbial Source Tracking

The City of Tulsa has initiated microbial source tracking (MST) to further identify sources of bacteria within watersheds using a contractor called Luminultra out of Miami Florida. This analysis uses polymerase chain reaction to identify DNA markers for Humans and dogs. These are collected alongside traditional bacteria samples to give comparison to elevated levels of e. coli to elevated levels of bacteroides markers. MST is relatively new to the State of Oklahoma, and little guidance is available on how to arrange results to give the best direction, but it is still useful to point in a direction of where the primary source of bacteria might be coming from. Sampling did not begin for previous years watershed characterization streams (2021-2022) until the end of the reporting period. This was to save cost by sampling only streams that exceeded water quality standards for E. coli, which could not be assessed until a geomean was found after recreation period sampling. Three rounds of sampling were performed during a period of average to low flow, and turnaround time was generally one to two weeks for results. While there is no standard to measure to, influent samples were taken from Southside Wastewater Treatment and Northside Wastewater Treatment to give a benchmark to compare to. Below are the results.

Location	Date Sampled	Human	Dog	E. coli MPN/100mL	Entero MPN/100mL
Crow Creek	6/27/2022	7.43E+02	6.15E+03	330	520
	7/26/2022	2.07E+02	9.15E+03	870	830
	10/31/2022	2.82E+02	7.41E+02	100	200
Dirty Butter Creek	6/27/2022	9.00E+03	3.98E+01	280	110
	7/26/2022	1.19E+03	7.97E+01	1300	2420
	10/31/2022	2.81E+04	2.95E+03	220	64
Flat Rock Creek	6/27/2022	9.33E+02	0.00E+00	120	140
	7/26/2022	4.32E+02	2.22E+02	1600	1400
	10/31/2022	2.03E+03	7.27E+02	130	98
Hager Creek	6/27/2022	3.19E+02	1.26E+02	79	770
	7/26/2022	8.63E+02	0.00E+00	3600	2420
	10/31/2022	DNQ	2.60E+02	63	290
Harlow Creek	6/27/2022	2.13E+03	2.31E+02	1000	1200
	7/26/2022	9.71E+01	0.00E+00	18	89
	10/31/2022	0.00E+00	0.00E+00	1000	1600
Mooser Creek	6/27/2022	0.00E+00	0.00E+00	58	980
	7/26/2022	0.00E+00	0.00E+00	28	440
	10/31/2022	0.00E+00	0.00E+00	41	44
Nickel Creek	6/27/2022	3.65E+02	4.60E+02	99	490
	7/26/2022	7.91E+02	8.00E+02	66	200
	10/31/2022	0.00E+00	5.85E+02	27	30
Northside WWTP	6/27/2022	1.15E+07	2.41E+05	N/A	N/A
Southside WWTP	6/27/2022	3.75E+07	7.81E+05	N/A	N/A

The City of Tulsa is continuing to use these results to target watersheds for public education where contamination is evident. Every stream, except for Mooser Creek, showed Human and Dog Bacteroides present in the samples.

Date	Stream name	Parameter	Measured value	Follow up result
Jul-22	Ford Creek	TDS	414 mg/L	Maybe caused by high levels of algae
Jul-22	Spunky Creek	Total Phosphorus	0.595 mg/L	Green Country WWT effluent
Aug-22	Fry Ditch Creek	E. coli, Enterococcus	1400 MPN/100 mL, 2420 MPN/ 100 mL	No evidence of saniatary sewer
Aug-22	Haikey Creek	Enterococcus	820 MPN/100 mL	No evidence of saniatary sewer
Aug-22	Vensel Creek	Enterococcus	250 MPN/100 mL	No evience of sanitary sewer
Sep-22	Ford Creek	E. coli	210 MPN/100 mL	No evidence of sanitary sewer
Sep-22	Fry Ditch Creek	E.coli, Enterococcus	260 MPN/100 mL, 1000 MPN/100 mL	No evidence of saniatary sewer
Sep-22	Haikey Creek	E.coli, Enterococcus	2400 MPN/100 mL, 770 MPN/100 mL	No evidence of saniatary sewer
Sep-22	South Park Creek	Enterococcus, TDS	2420 MPN/100 mL, 589 mg/L	No evidence of sanitary sewer. Source of high TDS not found
Sep-22	Spunky Creek	Total Phosphorus	0.425 mg/L	Green Country WWT effluent
Sep-22	Vensel Creek	E.coli, Enterococcus	1600 MPN/100 mL, 180 MPN/100 mL	No evidence of sanitary sewer
Sep-22	Joe Creek	Enterococcus	86 MPN/100 mL	No evidence of saniatary sewer
Oct-22	Fry Ditch Creek	E.coli, Enterococcus	1600 MPN/100 mL, 820 MPN/100 mL	No evidence of saniatary sewer
Oct-22	Haikey Creek	E.coli, Enterococcus	150 MPN/100 mL, 160 MPN/100 mL	No evidence of saniatary sewer
Oct-22	Joe Creek	E.coli, Enterococcus	730 MPN/100 mL, 340 MPN/100 mL	No evidence of saniatary sewer
Oct-22	South Park Creek	E.coli, Enterococcus, TDS	650 MPN/100 mL, 1000 MPN/100 mL, 534 mg/L	No evidence of sanitary sewer. Source of high TDS not found
Oct-22	Vensel Creek	E.coli, Enterococcus	650 MPN/100 mL, 78 MPN/100 mL	No evidence of sanitary sewer
Nov-22	Fry Ditch Creek	E.coli, Enterococcus	160 MPN/100 mL, 49 MPN/100 mL	No evidence of saniatary sewer
Nov-22	Joe Creek	E.coli, Enterococcus	210 MPN/100 mL, 42 MPN/100 mL	No evidence of saniatary sewer
Nov-22	South Park Creek	Enterococcus, TDS	58 MPN/100 mL, 397 mg/L	No evidence of saniatary sewer. Many geese noted in the area. Source of high TDS not found
Nov-22	Spunky Creek	Total Phosphorus	0.612 mg/L	Green Country WWT effluent
Nov-22	Vensel Creek	E.coli, Enterococcus	820 MPN/100 mL, 64 MPN/100 mL	No evidence of sanitary sewer
Dec-22	Joe Creek	E.coli, Enterococcus	490 MPN/100 mL, 270 MPN/100 mL	No evidence of saniatary sewer
Dec-22	Spunky Creek	E.coli, Enterococcus,Total Phosphorus	2400 MPN/100 mL, 2000 MPN/100 mL, 0.242 mg/L	Green Country WWT effluent
Dec-22	Vensel Creek	E.coli, Enterococcus	2600 MPN/100 mL, 2420 MPN/100 mL	No evidence of sanitary sewer
Jan-23	South Park Creek	TDS	671 mg/L	Source not found
Jan-23	Spunky Creek	Total Phosphorus, TDS	0.333 mg/L, 358 mg/L	Green Country WWT effluent
Feb-23	South Park Creek	TDS	424 mg/L	Continue to track source
Feb-23	Spunky Creek	TDS	426 mg/L	Green Country WWT effluent
Feb-23	Vensel Creek	E.coli, Enterococcus, Turbidity	920 MPN/100 mL, 2420 MPN/100 mL, 77 NTU	Resampled turbidity, normal result. No evidence of sanitary sewer
Mar-23	South Park Creek	TDS	580 mg/L	Source not found
Mar-23	Spunky Creek	E.coli, Enterococcus, TDS	390 MPN/100 mL, 59 MPN/100 mL, 453 mg/L	Green Country WWT effluent
Mar-23	Vensel Creek	E.coli, Enterococcus	980 MPN/100 mL, 2420 MPN/100 mL	No evidence of sanitary sewer
Apr-23	South Park Creek	TDS	723 mg/L	Went out during rain event. Source not found
Apr-23	Spunky Creek	Total Phosphorus, TDS	0.322 mg/L, 423 mg/L	Green Country WWT effluent
May-23	Joe Creek	E.coli, Enterococcus	310 MPN/100 mL, 460 MPN/100 mL	Appears to have been a sanitary sewer overflow
May-23	South Park Creek	E.coli, Enterococcus	310 MPN/100 mL, 340 MPN/100 mL	Source not found. Concluded that the TDS concentration may be naturally occuring
May-23	Spunky Creek	Total Phosphorus	0.555 mg/L	Green Country WWT effluent
May-23	Vensel Creek	E.coli, Enterococcus	2400 MPN/100 mL, 920 MPN/100 mL	Sanitary sewer line that crosses the creek is leaking
Jun-23	Ford Creek	E.coli, Entercoccus	280 MPN/100 mL, 61 MPN/100 mL	Low flow
Jun-23	Fred Creek	E.coli, Enterococcus	240 MPN/100 mL, 2400 MPN/100 mL	Low flow
Jun-23	Fry Ditch Creek	E.coli, Enterococcus	920 MPN/100 mL, 1600 MPN/100 mL	No evidence of saniatary sewer
Jun-23	Haikey Creek	E.coli, Enterococcus, Turbidity	5000 MPN/100 mL, 12000 MPN/100 ML, 55 NTU	Resampled turbidity, normal result. Appears to have been work on lines that cross the creek
Jun-23	Joe Creek	E.coli, Enterococcus	33000 MPN/100 mL, 2420 MPN/100 mL	No evidence of saniatary sewer
Jun-23	Vensel Creek	E.coli, Enterococcus	160 MPN/100 mL, 220 MPN/100 mL	Bacteria levels are still high after the overflow event

Section 5

Annual Expenditures for the Reporting Period/Budget for the Year Following Each Annual Report

	FY 2022/2023 Actual (before audit)	FY 2023/2024 Budget
Section Name		
Warehouse	$18,657	$10,651
Customer Care	$322,646	$410,361
Security (Direct charge fund 560)	$63,000	$63,000
Asset Management Admin (plus 1614)	$728	$898
Security	$214,834	$321,252
Building Operations – Administration	$0	$0
Building Operations – Contracts	$2,957	$3,120
Building Maintenance	$19,411	$20,218
Custodial Services	$13,076	$12,510
IT Capital Direct Charges	$0	$36,000
Engineering Services Administration	$128,801	$0
Engineering Administration – Stormwater	$343,341	$0
~~Reproduction~~ changed to Central Services	$281,107	$0
Design Services – Administration	$106,052	$0
Design	$841,368	$0
Hydrology and Hydraulics	$0	$0
Alert System	$61,095	$0
Field Engineering – Administration	$63,377	$0
Construction Inspection	$622,189	$0
Call OKIE – Encroachments	$70,471	$0
Field Surveys	$174,782	$0
Planning and Project Management Administration	$52,701	$0
Project Management	$8,408	$0
Infrastructure Management	$177,700	$0

Graphics / CADDS	$337,323	$0
Floodplain Management	$1,077,960	$0
Planning Stormwater/General	$131,553	$0
Engineering Graphics	$307,076	$0
Right of Way	$152,855	$0
Streets & Stormwater – Administration	$157,494	$289,563
SS Payroll & Accts Payable	$35,414	$97,320
SS – Stormwater Fund	$5,056,539	$6,580,326
SS - Legal Representation	$40,055	$48,977
S&SW Dir Internal IT	$51,275	$139,028
Stormwater & Land Management Admin	$1,207,717	$3,984,749
Detention, Ditch, Concrete Channel	$1,259,033	$1,538,140
Channel Maintenance and Ditching	$1,318,961	$2,629,277
Storm Sewer Maintenance	$862,313	$3,177,346
Stormwater Quality	$1,401,019	$2,078,185
Stormwater Vegetation	$2,526,409	$3,413,046
Land Reclamation Site	$74,626	$104,456
Household Pollutant Collection	$45,196	$61,600
Land Reclamation Site	$0	$0
STREET MAINT & INSPECTIONS - ADMIN	$198,298	$202,127
STREET MAINTENANCE -- PATCHING	$967,870	$1,000,740
Paving Cut Administration	$38,539	$60,357
S&SW Mowing and Sweeping	$1,736,843	$2,810,369
S&SW Invest/Inspection	$757,231	$887,848
S&SW Stormsewer Cleaning	$841,558	$889,098
S&SW Stormsewer Repairs	$1,831,437	$1,988,119
PW Ad Central Svs	$0	$57,044
PW Design Admin	$0	$48,845
PW Design Services	$0	$81,196
PW Field Administration	$0	$141,203
PW Field Const Inspect	$0	$603,752
PW Field Surveys	$0	$205,413
PW Planning Admin	$0	$316,655
PW Planning Proj Mgt	$0	$159,336
PW Planning Infrastructure	$0	$187,591
PW Planning ROW Acquisition	$0	$195,463

Water and Sewer Admin.	$26,611	$0
Water & Sewer Dept. – Stormwater	$95,712	$520,600
W&S Admin Internal IT	$3,207	$7,220
Quality Assurance – Administration	$8,573	$11,838
Quality Assurance – Operations Support	$1,159	$1,880
Laboratories	$161,624	$168,054
Distribution Systems - Administration	$18,399	$20,598
Field Cust. Serv. Rep. I (Meter Reading)	$62,041	$115,059
Field Cust. Serv. Rep. II (Meter Turn On/Off)	$0	$0
Sewer O & M – Admin	$84,785	$108,755
Lift and Pump Stations	$306,536	$323,130
Utility Planning & Design Admin	$0	$72,385
Utility Design	$0	$1,063,621
Utility Asset Planning	$0	$333,712
Uitilty GIS	$0	$606,448
General Site Services changed to P&R Fac Sys Land & Gen Maint	$384,809	$429,202
Horticulture changed to P&R Uti Svs Horticulture	$101,168	$125,945
Park - Fac Svs Forestry - New split from Horticulture	$60,214	$81,367
Fin Dir Internal IT	$5,530	$6,830
Utilities Administration	$753,131	$796,758
IT Administration	$42,398	$61,083
IT Operations	$258,056	$269,803
IT Client Services	$329,713	$412,983
IT Cloud Services	$0	$174,785
Sewer O & M – Support Services / Dispatch	$15,410	$12,404
Transfer to Capital Projects	$5,440,000	$7,189,000
Debt Service	$2,299,853	$3,286,000
Total	**$36,460,224**	**$51,054,640**

Section 6

A Summary of Enforcement Actions, Inspections, and Public Education

A. Enforcement Actions

It is the philosophy of the City of Tulsa to bring responsible parties into compliance through education prior to initiating any enforcement action. Enforcement actions are taken only when deemed necessary to ensure permit compliance.

During this reporting period 266 investigations were conducted identifying 34 illicit discharges to the storm sewers. Title 11-A Chapter 5 (Pollution Ordinance) was adopted November 1995 and continues to be utilized for the removal of non-storm water discharges (see Section 6). This Ordinance allows the City of Tulsa to recover cleanup cost from the responsible party.

A summary of the investigations conducted by the Stormwater Management Division are as follows:

Number of Investigations	Description of Investigations
20	Construction (relating to construction site potential violations)
14	Hazmat (relating to potential discharges of pollutants from fire department responses involving the hazardous materials unit)
230	Stormwater (relating to potential releases of pollutants to the storm sewer or violations of the pollution ordinance)
2	Drug Labs (relating to the potential release of pollutants from drug lab remediation to the storm sewer or violations of the pollution ordinance)
266	Total number of investigations for this reporting year

- Construction Site – Erosion Control

    - The Stormwater Management Division conducted 1,629 construction site inspections resulting in 11 enforcement actions. These actions consisted of issuing a notice of violation that may involve fines and cost recovery. The total amount of fines and penalties collected was $700.

- Industrial, Commercial and Residential Sites

    - Tulsa continued to use the Industrial and High Risk Runoff program to identify, monitor and control pollutants from municipal landfills; treatment, storage and disposal facilities for municipal waste; facilities subject to EPCRA Title III, Section 313 reporting requirements; and any other industrial or commercial discharge the City determined had the potential to contribute substantial pollutant loading to the City's storm sewer system. This program contains procedures for inspecting, monitoring and controlling pollution from the aforementioned sources. A database of industrial storm water sources discharging to the City's storm sewer continues to be maintained. During this reporting period, 401 industrial stormwater inspections were conducted. Six enforcement actions were taken against industries or facilities in order to eliminate illegal or illicit discharges. $450 in fines was levied during this fiscal year.

B. Inspections

The following is a summary of inspections that were conducted during this reporting period. These inspections were previously mentioned in other sections of this report.

Sewer Operations Maintenance and SM conducted the following:

- Sanitary sewer lines TV inspected – 64 miles

SM conducted the following inspections:

- Storm sewer lines inspected – 14 miles
- Industrial and commercial storm water runoff inspections – 401
- Construction site erosion control inspections – 1,629

Development Services conducted the following number of inspections:

- 2,421 construction site inspections were conducted with attention on erosion controls measures.

Engineering Services conducted the following inspections:

- Daily inspections at construction projects (84 city and 36 privately funded Infrastructure Development Process (IDP) projects).

C. Public Education Programs

The public education programs utilized by the City of Tulsa have been described in Section 1 of this report. The City of Tulsa understands that public education plays a major role in reducing non-point source pollution and improving stormwater runoff quality. Tulsa believes that it is better to prevent non-point source pollution at the source through education than to control it after it is generated. Many educational programs used by the City of Tulsa to meet permit requirements are completed through the cooperative efforts of other groups, such as The M.e.t. and the Tulsa County Conservation District, as well as various City of Tulsa departments. Through activities such as educational events, presentations, school visits, summer day camps, conferences, television/radio commercials, billboards etc. education material was viewed many millions of times during this reporting period. See below for more information on Tulsa's Public Education Program's.

Attachment A "Public Education 2022-2023" lists the educational material distributed during this reporting period by the City of Tulsa.

Attachment B "Education Events 2022-2023" lists the educational activities performed during this period by the City of Tulsa.

Attachment C "Children's Education Activities 2022-2023" lists various educational activities performed for children's groups.

Attachment A: Education materials distributed or used in FY 22-23

	Illicit Discharge	Animal Waste	Antifreeze	Motor Oil	Paint	Fertilizer	Pesticides	LID	Compost	Yard Waste	Erosion	Floatables	Master Gardener	HHPCF	Customer Care Line/Website	# Distributed
General Brochure	x	x	x	x	x	x	x	x	x	x	x	x		x	x	479
General Brochure Spanish	x	x	x	x	x	x	x	x	x	x	x	x		x	x	22
Pet Waste	x	x					x								x	1
Pesticides	x					x	x						x	x	x	289
Motor Oil	x		x	x										x	x	742
Fertilizer	x					x							x	x	x	1028
Pollution Prevention Plan	x														x	47
Grass and Leaves	x									x					x	129
Litter Flyer	x		x	x			x			x					x	147
SWQ Folder	x														x	191
Landscaping BMP	x					x	x			x			x		x	870
Drawstring Backpack															x	968
LID	x					x	x	x		x					x	67
Outside Washing	x		x	x											x	17
HHPCF Brochure	x		x	x	x	x	x	x							x	525
HHPCF Brochure Spanish	x		x	x	x	x	x	x							x	2
Activity Pages	x	x	x													1482
Mingo Cutout Activity	x															273
Runoff Card*	x	x	x	x	x	x	x			x		x			x	1056
Rain Gauge	x														x	1235
Pencils	x															1002
Educational Display	x	x	x	x	x	x	x	x	x	x	x	x	x		x	48
Tumblers															x	57
Pet Waste Bags	x	x														1755
Pens	x														x	1262
Cleanup Shirts	x														x	853
Seed Packets	x														x	3373
SOS Tote Bags	x					x	x								x	2240
Sunglasses																503
Risk of Flooding Info	x														x	30
Adopt a Stream Flyer	x														x	89
Bobbers																1912
SOS Chip Clip															x	822
HPCF Chip Clip															x	745
Rain Barrel Flyer	x															200
Construction BMP	x														x	130
Pond Maintenance	x	x													x	0
Car Washing	x		x	x											x	16
HPCF Fridge Maget	x		x	x	x	x	x	x							x	1668
SOS- Litter Breakdown	x											x			x	889
Creek Cleanup Flyer	x											x				26
Rain Barrel																310
Koozies															x	538
Door Hanger	x					x									x	30
Total Materials																**28068**

Attachment B: Events in FY 22-23

Date	Event Name	Decription	# attended
7.1.2022	Stormwater Newsletter	Stormwater Newsletter sent out to residents of Tulsa	2,072
7.2.2022	Facebook	Swap Shop	52500
7.2.2022	Instagram	Pesticide Information	6718
7.5.2022	Summer Camp	Summer camp at Reed Park	9
7.6.2022	TPS	Went to Booker T to talk to the students about pollution in the storm drain.	46
7.7.2022	PPI Meeting	Monthly Meeting Discussing Flood Insurance	14
7.7.2022	Summer Camp	Summer camp at Reed Park	8
7.7.2022	1st Thursday	Monthly Environmental Meeting	58
7.7.2022	TPS-Hale HS	Went to Hale junior highschool to talk to the students about pollution in the storm drain	12
7.8.2022	Youtube	Biosampling Video	50
7.8.2022	Day Camp	Summer camp at Hicks Park	34
7.11.2022	Pre-Development Meeting	This meeting was for the construction of a residential development.	13
7.11.2022	Summer Camp	Summer camp at Chamberlain Park	7
7.13.2022	TPS	Went to Memorial HS to talk to the students about pollution in the stormdrain	39
7.15.2022	Pre-Development Meeting	This meeting was for the construction of a distribution center.	15
7.16.2022	Twitter	HHP	4
7.18.2022	Day Camp	Day camp at Chamberlain Park	3
7.19.2022	Day Camp	Day camp at WaterWorks	32
7.19.2022	Job Fair	Career Expo	
7.20.2022	OFMA Conference	Stormwater Conference	76
7.21.2022	Summer Camp	Summer camp at Discovery Lab	20
7.25.2022	Internal Training-Field Engineering Meeting	General overview of construction ECM inspections and OKR10	16
7.27.2022	Drillers Game	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	4,875
7.30.2022	Kendall-Whittier Farmers Market	Farmers market for citizens of Tulsa. A table was set up and information about pollution getting into the storm drain was distributed.	200
8.1.2022	Pre-Development Meeting	This meeting was for the construction of an office and retail center	17
8.1.2022	Pre-Development Meeting	This meetinge was for the construction of commercial property.	14
8.1.2022	Twitter	Career Fair Flyer	61005
8.2.2022	Twitter	Career Fair Flyer	61005
8.5.2022	Twitter	HHP	61005
8.6.2022	Greenwood Farmers Market	Farmers market for citizens of Tulsa. A table was set up and information about pollution getting into the storm drain was distributed.	30
8.8.2022	Pre-Development Meeting	This meeting was for the construction of a sporting goods store	17
8.13.2022	Twitter	Adopt A Stream	61005
8.13.2022	Twitter	Career Fair Flyer	61005
8.14.2022	Facebook	Keep our creeks clean	52500
8.15.2022	Twitter	Career Fair Flyer	61005
8.17.2022	Twitter	Career Fair Flyer	61005
8.17.2022	Facebook	Career Fair Flyer	52500
8.17.2022	Career Fair	Career Fair held for cizitens of Tulsa for open jobs within the city.	536
8.20.2022	Twitter	HHP	3
8.31.2022	Drillers Game	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3,930
9.1.2022	PPI Meeting	Monthly Meeting Discussing Flood Insurance	14
9.1.2022	City Life	Utility Bill Stuffer	140,600
9.8.2022	Oxley Nature Training	Internal Training for Oxley Nature Volunteers	6
9.9.2022	Day of Caring	Day of Caring Event. We went to Centennial Park to clean	8
9.11.2022	Instagram	Species Spotlight	22
9.12.2022	Pre-Development Meeting	This meeting was for the construction of a fast food restaurant	14

Date	Event Name	Decription	# attended
9.20.2022	Twitter	HHP	61005
9.20.2022	Facebook	HHP	52500
9.24.2022	Twitter	Pool water discharge	61005
9.24.2022	Facebook	Pool water discharge	52500
9.24.2022	Crow Creek Work Day	Had a cleanup day at the Crow Creek Meadow	12
9.26.2022	Pre-Development Meeting	This meeting was for the construction of a RV park	13
9.29.2022	Twitter	Leaves and Stormdrain	61005
9.30.2022	Instagram	State Fair	6718
9.30.2022	Facebook	Leaves and Stormdrain	52500
9.30.2022	Twitter	State Fair	61005
10.1.2022	Facebook	State Fair	52500
10.1.2022	Stormwater Newsletter	Stormwater Newsletter sent out to residents of Tulsa	2072
10.1.2022	City Life	Utility Bill Stuffer	140,600
10.3.2022	Pre-Development Meeting	This meeting was for the construction of a John 3:16 mission.	13
10.6.2022	Twitter	HHP	61005
10.8.2022	Instagram	State Fair	6718
10.8.2022	Facebook	State Fair	52500
10.10.2022	Twitter	Educational Events	61005
10.10.2022	Pre-Development Meeting	This meeting was for the expansion of the Car Max Lot.	11
10.10.2022	Pre-Development Meeting	This meeting was for the construction of a residential development.	13
10.14.2022	Facebook	Fishing Derby	52500
10.14.2022	Twitter	Fishing Derby	61005
10.14.2022	Twitter	HHP	61005
10.14.2022	Instagram	Fishing Derby	6718
10.17.2022	Twitter	Stormwater Newsletter	61005
10.20.2022	Twitter	Leaves and Stormdrain	61005
10.23.2022	Instagram	HHP	6718
10.25.2022	Instagram	Leaves and Stormdrain	6718
10.26.2022	Twitter	Species Spotlight	61005
10.26.2022	Builders and Developers Council Meeting	Annual meeting that discusses different aspects of building.	40
10.27.2022	Instagram	Species Spotlight	6,718
10.28.2022	Facebook	HHP	52,500
10.28.2022	TPS-Central	Went to Central Middle School to discuss pollution in the storm drains	130
10.29.2022	Trash 4 Treat	Cleanup event at Zink park	25
11.1.2022	Flu Shots	City employees went to the HHP to receive their flu shots	30
11.1.2022	City Life	Utility Bill Stuffer	140600
11.2.2022	Trash/Floatables Meeting	Meeting to discuss installing a trash boom.	8
11.3.2022	1st Thursday	Monthly Environmental Meeting	30
11.4.2022	TPS-East Central	Went to East Central to discuss the impact of pollution on the environment	92
11.12.2022	Crow Creek Meadow Work Day	Had a cleanup day at the Crow Creek Meadow	7
11.15.2022	TPS-East Central	Went to East Central to discuss the impact of pollution on the environment	42
11.18.2022	TPS-Hale HS	Went to Hale junior highschool to talk to the students about pollution in the storm drain	317
12.1.2022	1st Thursday	Monthly Environmental Meeting	50
12.1.2022	Stormwater Newsletter	Stormwater Newsletter sent out to residents of Tulsa	2072
12.5.2022	Pre-Development Meeting	Pre-Construction meeting discussing ECM's on a construction project.	9
12.6.2022	Pre-Development Meeting	Pre-Construction meeting discussing ECM's on a construction project.	10
12.12.2022	Instagram	Swap Shop	6718
12.12.2022	TPS-Edison	Went to Edison middle school to discuss the impact of pollution on the environment	254
12.13.2022	Facebook	Swap Shop	52500
12.15.2022	TPS-Webster	Went to Webster middle school to discuss the impact of pollution on the environment	103
12.16.2022	Twitter	HHP	61005
12.18.2022	Twitter	Watershed Map	61005
12.19.2022	Pre-Development Meeting	This meeting was for the construction of a trucking company.	14

Date	Event Name	Decription	# attended
12.24.2022	Facebook	HHP	52500
12.29.2022	Facebook	Leaves and Stormdrain	52500
1.5.2023	Instagram	Stormdrain Information	6718
1.5.2023	PPI Meeting	Monthly Meeting Discussing Flood Insurance	18
1.5.2023	1st Thursday	Monthly Environmental Meeting	57
1.5.2023	TPS- Thoreau	Went to Thoreau Demostration academy to discuss the impact of pollution on the environment	81
1.6.2023	Twitter	Stormdrain Information	61005
1.9.2023	Pre-Development Meeting	This meeting was for the construction of tri-plexes in west Tulsa. The owners stated that they would not be using any LID techniques for this site.	17
1.13.2023	Twitter	Species Spotlight	61005
1.20.2023	Facebook	LID	52500
1.23.2023	Pre-Development Meeting	This meeting was for the construction of a warehouse distribution center. The owner stated that they would not use any LID techniques for this project.	16
1.23.2023	Pre-Development Meeting	This meeting was for the construction of an Oasis Fresh Market and YMCA. The owners stated that they would not be using any LID techniques for this project.	17
1.24.2023	Facebook	Deicer	52500
1.24.2023	Twitter	Deicer	61005
1.27.2023	Twitter	Erosion Control	61005
1.28.2023	Twitter	HHP	61005
2.1.2023	City Life	Utility Bill Stuffer	140600
2.2.2023	1st Thursday	Monthly Meeting Discussing Flood Insurance	45
2.2.2023	Internal Training - Development Services	Internal Training for Development Services	7
2.3.2023	TPS Edison	Went to Edison middle school to discuss the impact of pollution on the environment	274
2.6.2023	Internal Training-Field Engineering Meeting	Internal Training for Field Engineering regarding our Audit	17
2.6.2023	Pre-Development Meeting	This meeting was for the construction of Tracey Est. (Residential Development). The owners stated they would not be using LID techniques on this project.	13
2.8.2023	Internal Training for Water Department	Internal Training for the water department at 23rd and Jackson	78
2.10.2023	Instagram	Species Spotlight	6,718
2.10.2023	TPS Hale	Went to Hale junior highschool to talk to the students about pollution in the storm drain	323
2.11.2023	Twitter	Species Spotlight	61,005
2.12.2023	Facebook	Annual Report	52,500
2.15.2023	Internal Training	Went to 56th and Garnett to discuss the future audit and what was expected of their department	37
2.15.2023	Internal Training	Went to EMD to discuss the future audit and what is expected from their department	12
2.16.2023	Internal Training	Audit Training for Parks Department	2
2.17.2023	Twitter	Swap Shop	61005
2.17.2023	TPS Monroe	Went to Monroe middle school to talk to the students about pollution in the storm drain	124
2.18.2023	Facebook	Swap Shop	52500
2.19.2023	Facebook	Crow Creek Workshop	52500
2.20.2023	Pre-Development Meeting	This meeting was for the construction of a residential development. The owner stated they would not be using any LID techniques.	16
2.24.2023	Oilers Game	Set up a table at an Oilers Game and provided information about stormwater quality.	5692
2.25.2023	Butterflies, Birds, and Bees OH My! Crow Creek Meadow Workshop	Workshop discussing how to set up a pollinator garden	30
2.25.2023	Oilers Game	Set up a table at an Oilers Game and provided information about stormwater quality.	14969
2.27.2023	Pre-Development Meeting	This meeting was for the construction of a grocery, hotel, parking lot, and apartment complex	28
2.28.2023	Outdoor Ed	Outdoor class teaching kids about different pollutants in a stream	5
2.28.2023	Fox 23	Rain Barrel Sale	326000
3.1.2023	Stormwater Newsletter	Stormwater Newsletter sent out to residents of Tulsa	2,072
3.1.2023	SOM Training	Internal training for the SOM department	6

Date	Event Name	Decription	# attended
3.1.2023	City Life	Utility Bill Stuffer	140600
3.2.2023	1st Thursday	Monthly Environmental Meeting	42
3.2.2023	PPI Meeting	Monthly Meeting Discussing Flood Insurance	11
3.3.2023	TPS Rogers	Went to Rogers Middle School to discuss the impact of pollution on the environment	76
3.4.2023	Instagram	Litter Breakdown	6718
3.9.2023-3.12.2023	Home and Garden Show	We had a 10x40 SWQ booth with education, fish tanks, promo items, and commercials	21364
3.10.2023	Oilers Game	Set up a table at an Oilers Game and provided information about stormwater quality.	5704
3.11.2023	Oilers Game	Set up a table at an Oilers Game and provided information about stormwater quality.	13388
3.11.2023	Instagram	Home and Garden Show	6718
3.16.2023	Instagram	Great Tulsa Cleanup	6718
3.20.2023	Channel 8	Rain Barrel Sale	240000
3.20.2023	Channel 6	Rain Barrel Sale	260000
3.20.2023	News 9	Rain Barrel Sale	295000
3.20.2023	Pre-Development Meeting	This meeting was for the possible construction site on 14700 E Admiral Pl. They said that they would not implement LID.	20
3.21.2023	Instagram	Rain Barrel Sale	6,718
3.24.2023	Internal Training	Audit Training for Streets Maintainance	8
3.26.2023	Oilers Game	Set up a table at an Oilers Game and provided information about stormwater quality.	6792
3.28.2023	Sustainability Fair	Union Highschool's sustainability/science fair.	300
3.28.2023	Presentation	Presentation given at Fellowship United Church of Christ about stormwater quality.	12
3.29.2023	STEM With Reed Park	Went to Reed park to discuss the impact of pollution in storm drains.	9
3.29.2023	IDP	Pre-Work IDP 116448 2022 Nick Creek Phase 5 meeting	6
3.30.2023	Facebook	Cleanup	52500
4.3.2023	Internal Training	Audit training for Fire Department	10
4.5.2023	Facebook	Pet Waste Sign	52500
4.7.2023	Facebook	Fertilizer and Pesticides	52500
4.8.2023	Oilers Game	Set up a table at an Oilers Game and provided information about stormwater quality.	6197
4.9.2023	Facebook	Rain Barrel Sale	52500
4.11.2023	7th Grade STEM Night	STEM night at 6th/7th Education Center	245
4.12.2023	Reed Park Cleanup	In honor of Earth Month and the Great Tulsa Cleanup Janell and a group of students, and Reed park staff cleaned up Reed park/Cherry Creek.	7
4.13.2023	TPS-Met	Went to Met middle school to discuss the impact of pollution on the environment.	65
4.14.2023	TPS-Webster	Went to Webster middle school to discuss the impact of pollution on the environment.	78
4.19.2023	Facebook	Environmental Expo at Guthrie Green	52,500
4.19.2023	Enviro Expo	Environmental Expo at Guthrie Green	300
4.20.2023	Instagram	Great Tulsa Cleanup	6718
4.20.2023	Facebook	Great Tulsa Cleanup	52500
4.21.2023	Facebook	Enviro Expo	52500
4.21.2023	Instagram	Enviro Expo	6718
4.22.2023	Party for the Planet	Event held at the Tulsa Zoo in order to teach the public about different pollutants and environmental education.	2941
4.26.2023	Facebook	Rain Barrel Sale	52500
4.26.2023-4.27.2023	SWOCC	Stormwater Operators Certification Course for Streets and Stormwater employees.	13
4.27.2023	Instagram	Flood Expo	6,718
4.29.2023	Instagram	HPCF	6,718
4.29.2023	Neighborhood Association Meeting	Spoke to HOA members about SWQ in Tulsa including upcoming Crow Creek events.	50
7.5.2022	Summer Camp	Summer camp at Reed Park	9
5.1.2023	Pre-Development Meeting	This meeting was for the construction of a restaurant. The owner stated that they would not be using LID techniques	19
5.1.2023	Pre-Development Meeting	This meeting was for the construction of a cultural center. The owners stated that they would not use LID techniques	20

Date	Event Name	Decription	# attended
5.1.2023	Pre-Development Meeting	This meeting was for the construction of a cultural center. The owners stated that they would not use LID techniques	20
5.4.2023	PPI Meeting	Monthly Meeting Discussing Flood Insurance	18
5.5.2023-5.6.2023	Philbrook Event	Philbrook Plant Sale. Crow Creek Community was present	568
5.8.2023	Pre-Development Meeting	This meeting was for the construction of an office park. Owners stated that they would not be using LID techniques for the project.	19
5.8.2023	Pre-Development Meeting	This meeting was for the construction of a Hmong Cultural Central. The owners stated that they would not be using LID techniques.	21
5.15.2023	Pre-Development Meeting	This meeting was for the construction of an auto auction. The owners stated they would not be using any LID techniques	28
5.22.2023	Pre-Development Meeting	This meeting was for the construction of a residential development. The owner stated they would not be using any LID techniques.	20
6.1.2023	PPI Meeting	Monthly Meeting Discussing Flood Insurance	20
6.3.2023	Facebook	Pet Waste Sign	52500
6.4.2023	Instagram	Pet Waste Sign	6718
6.6.2023	CAP - Eugene Field	Early STEM program for 2-4 year olds	30
6.7.2023	Drillers Game	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	6,054
6.8.2023	CAP - ECDC Reed	Early STEM program for 2-4 year olds	56
6.12.2023	Pre-Development Meeting	This meeting was for the construction of a Foods Distribution Center. The owners stated that they would not be using any LID techniques	21
6.12.2023	Pre-Development Meeting	This meeting was for the construction of Cesar Apts. The owner stated they would not be using any LID techniques	18
6.14.2023	Facebook	Fertilizer and Pesticides	52500
6.14.2023	Rain Barrel	Rain Barrel instructions given out to citizens.	1
6.15.2023	CAP - Disney	Early STEM program for 2-4 year olds	88
6.21.2023	Drillers Game	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3941

Attachment C: Tulsa Kids Education FY 22/23

Date	Event Name	Description	# Attended
7.5.2022	Summer Camp	Summer camp at Reed Park	9
7.6.2022	TPS	Went to Booker T to talk to the students about pollution in the storm drain.	46
7.6.2022	TPS	Went to Booker T to talk to the students about pollution in the storm drain.	46
7.7.2022	Summer Camp	Summer camp at Reed Park	8
7.7.2022	TPS-Hale HS	Went to Hale junior highschool to talk to the students about pollution in the storm drain	12
7.8.2022	Day Camp	Summer camp at Hicks Park	34
7.11.2022	TPS	Went to McClain to talk to students about pollution in the stormdrain.	40
7.11.2022	Summer Camp	Summer camp at Chamberlain Park	7
7.13.2022	TPS	Went to Memorial HS to talk to the students about pollution in the stormdrain	39
7.15.2022	Day Camp	Day camp at Whiteside Park	48
7.18.2022	Day Camp	Day camp at Chamberlain Park	3
7.19.2022	Day Camp	Day camp at WaterWorks	32
7.21.2022	Summer Camp	Summer camp at Discovery Lab	20
10.13.2022	TPS-Carver	Went to Carver Middle School to discuss the impact of pollution on the storm drain.	170
10..15.2022	Fishing Derby	Close to home fishing program at Hunter Park	50
10.21.2022	Discovery Lab	Day camp for students at Discovery Lab.	4
10.28.2022	TPS-Central	Went to Central Middle School to discuss pollution in the storm drains	130
10.29.2022	Trash 4 Treat	Cleanup event at Zink park	25
11.4.2022	TPS-East Central	Went to East Central to discuss the impact of pollution on the environment	92
11.15.2022	TPS-East Central	Went to East Central to discuss the impact of pollution on the environment	42
11.18.2022	TPS-Hale HS	Went to Hale junior highschool to talk to the students about pollution in the storm drain	317
12.2.2022	TPS-Memorial MS	Went to Memorial middle School to discuss the impact of pollution on the environment	308
12.9.2022	TPS-Rogers MS	Went to Rogers Middle School to discuss the impact of pollution on the environment	48
12.9.2022	Reed Park Christmas Event	Reed Park hosted a gift giving event for the community.	300
12.12.2022	TPS-Edison	Went to Edison middle school to discuss the impact of pollution on the environment	254
12.15.2022	TPS-Webster	Went to Webster middle school to discuss the impact of pollution on the environment	103
1.5.2023	TPS- Thoreau	Went to Thoreau Demostration academy to discuss the impact of pollution on the environment	81
1.20.2023	TPS-Central	Went to Central Middle School to discuss pollution in the storm drains	213
1.27.2023	TPS East Central	Went to East Central to discuss the impact of pollution on the environment	316
2.3.2023	TPS Edison	Went to Edison middle school to discuss the impact of pollution on the environment	274
2.10.2023	TPS Hale	Went to Hale junior highschool to talk to the students about pollution in the storm drain	323
2.17.2023	TPS Monroe	Went to Monroe middle school to talk to the students about pollution in the storm drain	124
2.24.2023	TPS Memorial	Went to Memorial middle School to discuss the impact of pollution on the environment	254
2.28.2023	Outdoor Ed	Outdoor class teaching kids about different pollutants in a stream	5
3.3.2023	TPS Rogers	Went to Rogers Middle School to discuss the impact of pollution on the environment	76
3.29.2023	STEM With Reed Park	Went to Reed park to discuss the impact of pollution in storm drains.	9
4.11.2023	7th Grade STEM Night	STEM night at 6th/7th Education Center	245
4.12.2023	Reed Park Cleanup	In honor of Earth Month and the Great Tulsa Cleanup Janell and a group of students, and Reed park staff cleaned up Reed park/Cherry Creek.	7
4.13.2023	TPS-Met	Went to Met middle school to discuss the impact of pollution on the environment.	65
4.14.2023	TPS-Webster	Went to Webster middle school to discuss the impact of pollution on the environment.	78
4.22.2023	Party for the Planet	Event held at the Tulsa Zoo in order to teach the public about different pollutants and environmental education.	2941
7.5.2022	Summer Camp	Summer camp at Reed Park	9
6.6.2023	CAP - Eugene Field	Early STEM program for 2-4 year olds	30
6.8.2023	CAP - ECDC Reed	Early STEM program for 2-4 year olds	56
6.13.2023	CAP - Frost	Early STEM program for 2-4 year olds	58
6.14.2023	Hicks Park Summer Camp	Summer camp at Hicks Park to discuss the impact of pollution in the environment	32
6.15.2023	CAP - Disney	Early STEM program for 2-4 year olds	88
Total:			6934

Section 7

Identification of Water Quality Improvements or Degradation

No water quality improvements or degradation were noted during this reporting period. The City of Tulsa has preliminarily identified some factors that appear to be negatively influencing the health of Tulsa's streams. We are also developing a baseline condition which will allow us to better determine improvements or degradation in water quality. Additional personnel recently added have begun to research further the issue of water quality degradation and any info collected will be reported on in the future.

Section 8
Watershed Characterization Program

In accordance with MS4 Permit #OKS000201 requirement Part IV(C)(8) the City of Tulsa submitted the Comprehensive Assessment of the Watershed Characterization Project in the FY 2014-2015 Annual Report. In this report, a summary of the Watershed Characterization Data is presented to satisfy Part II (A)(13)(13.)(b) Permit requirement.

Section 9
Co-permittee Reports

The City of Tulsa attests to the best of our knowledge, that the unaltered annual reports as submitted by both co-permittee's contain the required information.

OKLAHOMA Transportation

200 N.E. 21st Street
Oklahoma City, OK 73105-3204
www.odot.org

September 11, 2023

Roy Teeters, Storm Water & Land Management Division Manager
Department of Streets and Storm Water
City of Tulsa
4502 S. Galveston Ave.
Tulsa, OK 74107

Attention: Jacob Hagen

Dear Mr. Hagen:

Enclosed is the Oklahoma Department of Transportation portion of the Fiscal Year 2023 Annual Report to be submitted to the Oklahoma Department of Environmental Quality in accordance with the Tulsa Municipal Separate Storm Sewer System (Ms4) Permit Number OKS000201. This report covers the period from July 1, 2022 through June 30, 2023.

Please provide this office with one copy of the Annual Report as it is submitted. If you have any questions or require further information, please contact Kathryn Thomsen at 405-490-0375.

Sincerely,

B. Taylor

Brian Taylor, P.E.
Chief Engineer

Enclosure

OKLAHOMA Transportation

200 N.E. 21st Street
Oklahoma City, OK 73105-3204
www.odot.org

Annual Report

For

July 1, 2022 through June 30, 2023

"The mission of the Oklahoma Department of Transportation is to provide a safe, economical, and effective transportation network for the people, commerce and communities of Oklahoma."

OKLAHOMA Transportation

200 N.E. 21st Street
Oklahoma City, OK 73105-3204
www.odot.org

CERTIFICATION STATEMENT

NPDES Permit No. OKS000201
Review of Storm Water Annual Report

I certify under penalty 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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those 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.

B. Taylor

09/12/2023

Brian Taylor, P.E.
Chief Engineer

Date

OKLAHOMA Transportation

200 N.E. 21st Street
Oklahoma City, OK 73105-3204
www.odot.org

FISCAL YEAR
2023
ANNUAL REPORT
BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION (ODOT)
ON
TULSA MS4 PERMIT # OKS000201

September 11, 2023

Status

The Oklahoma Department of Transportation (ODOT) has implemented and is following the Storm Water Management Plan. The following items demonstrate activities undertaken for this annual reporting period.

Expenditures

As part of ODOT's Storm Water Management Program, the Tulsa metro area highway system shoulders are swept to remove sediment and debris. In the last year, 30,661 bags of litter were removed at the cost of $428,674.72. There are four two mile- increment Adopt-a-Highway locations in the Tulsa metro where litter is picked up twice a year, and five one-mile increment Adopt-a-Highway Corporation locations where litter is picked up once per month. In addition, ODOT right-of-way areas were moved in 7 cycles at the expense of $874,288.80.

Erosion and Sediment Control

The Department continues to monitor and inspect construction sites across the state with the goal to maintain compliance for OKR10 permits. Environmental Programs personnel conducted 343 site visits statewide. In addition to these statewide visits, District 8 has a contract for several sites to have weekly stormwater inspections and monthly environmental compliance inspections.

As the agency looks ahead to next year, the ODOT Clean Water Team will gain 6 Environmental Field Liaisons statewide, seven in total. ODOT district 8 will house one of these positions. This person will conduct monthly stormwater site inspections for every project in District 8, or more frequently as the need arises. They will also as serve as a point of contact for the field district for any environmental concerns. Given the success of the pilot position the agency had in District 4, we anticipate this will be a great advancement for the agency and our partners.

Non-Traditional MS4 Program

The agency, in partnership with the Oklahoma Turnpike Authority is currently in final negotiations to obtain an Individual Non-traditional Municipal Separate Storm Sewer System(Nt-Ms4) permit. The agencies continue develop a stormwater program that will adhere to the Minimum Control Measures once the permit is obtained.

Illicit Discharge Detection and Elimination Program (IDDE)

ODOT Maintenance facilities continue to use the guidance document which was developed to assist ODOT personnel in identifying and reporting an Illicit Discharge. As well as the stormwater program having opportunity for IDDE reporting on their webpage. Discussion on tracking Highway Spills from accidents is ongoing between ODOT Environmental Division, Maintenance personnel and the Highway Patrol. For this fiscal year, there were no reported illicit discharges reported.

Good Housekeeping / Pollution Prevention Plans (GHPPP)

In May of 2023, ODOT Environmental Programs conducted a training for the District 8 Headquarters Maintenance personnel, located in Tulsa. The GHPPP in this location was updated to comments made based on the audit conducted with the City of Tulsa and ODEQ.

In addition, the agency continues to evaluate any new county or local maintenance facilities which may be moved or rebuilt in current locations. Any new facilities will have upgrades which will aid the agency in complying with the GHPPP Minimum Control Measure by adding updated secondary containment devices and retention facilities.

Public Education/ Litter Program

ODOT in partnership with the Oklahoma Turnpike Authority (OTA), Association of Oklahoma General Contractors, and the Department of Environmental Quality (ODEQ) held the first Contractor Construction Compliance Conference (C4). This event was a success and brought various stakeholders to one room to discuss environmental compliance during construction. The agencies anticipate this to be a reoccurring event.

ODOT is an active member of the Central Oklahoma Storm Water Alliance (COSWA) and participates in their outreach events, such as radio ads and the Home and Garden Show. Efforts are also being made to add to online education regarding stormwater in the transportation industry.

Every year, school-age children participate in our annual poster contest. This year's contest is sponsored by ODOT, Oklahoma Department of Environmental Quality, Oklahoma Turnpike Authority, Cherokee Nation, OG&E, Oklahoma's Credit Union, Oklahoma Office of Management Enterprises – Web & Citizen Experience, Oklahoma Tourism & Recreation Department – State Parks Division, Keep Oklahoma Beautiful, Ardmore Beautification Council, Oklahoma City Beautiful, Oklahoma Rural Water Association, Solid Waste Institute of Northeast Oklahoma, Oklahoma State Department of Education, Oklahoma Department of Public Safety/Oklahoma Highway Patrol, and the Oklahoma Highway Safety

Office. The resulting contest Calendar, Entry Form, and Promotional Poster is created and printed for distribution to all Oklahoma public schools, tribal and homeschools, charter, private, parochial, and religious schools, juvenile correctional centers, businesses, libraries, and government agencies, Oklahoma's government offices, the House of Representatives, the Senate, chambers of commerce, managers/mayors, sheriffs, district attorneys, Corps of Engineers Lakes, Correctional Libraries, Oklahoma Lake Associations, all of the Dept. of Transportations in the US 50 States, Adopt-a-Highway groups, Oklahoma Military Bases, Oklahoma Military Recruitment Centers, Oklahoma Tribal Nations, USDA Conservation Districts, Oklahoma Universities, Colleges, and Vocational-Technical Schools, Oklahoma Tag Agencies, Oklahoma Newspapers, Radio Stations, and TV Stations, Oklahoma Schools of the Deaf and Blind, Main Street Associations, ODOT Field Districts & Maintenance & Construction Offices Statewide, TPC Contest Judges, TPC Contest Sponsors, to the citizens of the State of Oklahoma, and to all the State Winners, Teachers, and to 160 Poster Honorable Mention students and teachers. 30,000 posters, entry forms, and 2023 Trash Poster Calendars are being printed and will be distributed this winter in December throughout Oklahoma and the United States.

Adopt-a-Highway/ TRASH-OFF

ODOT'S anti-litter efforts are still on-going and include 138 separate "Adopt-a-Highway" groups who remove litter from their two-mile section of state highways at an interval of four times a year, and the "TRASH-OFF", an annual volunteer spring roadside cleaning sponsored by ODOT. Tulsa has 63 "Adopt-a-Highway" groups covering 126 miles at a minimum of four times a year.

Each Spring, the Annual ODOT Trash-Off is held, to go along with the annual Great American Cleanup. Groups have expanded Trash-Off day to Trash-Off week or month. ODOT, in partnership with Keep Oklahoma Beautiful (KOB), distributes trash bags, gloves, vests, water, etc., all over the state of Oklahoma for the annual Trash-Off. Last year, this effort resulted in excess of over three million pounds of litter and debris collected from Oklahoma roadsides and public areas. This saved taxpayers over an estimated five million dollars. In addition, ODOT is the Executive Patron Sponsor of KOB annual Environmental Excellence Awards Banquet, where ODOT presents two environmental Trash-Off awards given to judged/chosen participants for "Best First "Rookie" Effort" and "Best Overall Trash-Off Effort". Over 600 winners, finalists, guests, and attendees participate in this in-person Environmental Excellence Awards Celebration event.

Herbicide Application

ODOT continues to use integrated roadside vegetation management (IRVM). This includes proper vegetation selection, installation and post-installation management. In compliance with the Oklahoma Department of Agriculture, Food and Forestry, ODOT has a Herbicide Program Policy Directive that all personnel applying herbicides are Certified Pesticide Applicator and participate in yearly training pertaining to vegetation management. ODOT partners with Oklahoma State University and the Oklahoma Cooperative Extension Service to offer the Pesticide Applicators test required for a license during our annual workshops.

In FY 23, there were three pesticide applicator school trainings which took place in various locations across the state. These were conducted by Oklahoma State University (OSU) staff. There are two sessions to this training, session one had three locations, Clinton, Perry and McAlester, with a total of 23 participants. Session two also had three locations, Perry, Antlers and Weatherford, with a total of 22 participants.

There were twelve Continuing Education (CEU) Workshops held in seven of the eight ODOT field districts. The statewide total participants for these was 593. In District 8, Tulsa, there were 43 participants for CEU trainings.

Wildflowers

In the spring of 2016, a memorandum of agreement was signed by ODOT in partnership with the Federal Highway Administration and the Missouri, Texas, Iowa, Kansas and Minnesota DOTs designating Interstate 35 as the Monarch Highway. The goal is to protect more of the Monarch Butterfly's natural habitat by allowing milkweed and native flowers to grow in the right-of-way where possible. In anticipation of the collaboration, ODOT began refraining from mowing highway rights-of-way statewide, except where necessary, until July when the flowers are primed for seed dispersal. Mowing was continued in urban areas and safety zones, which includes medians and rights-of-way up to 30 feet from the pavement's edge. A pollinator garden was also planted by ODOT staff at the Oklahoma City Welcome Center. The garden is a registered Monarch Waystation and was remodeled in 2020. It is a 935 sq ft plot (.02 ac) containing five types of milkweed, Black-eyed Susans, purple coneflower and other types of wildflowers. The garden serves as an educational tool for the public to help recognize and protect milkweed and other native wildflowers.

On April 30, 2020, ODOT applied to join the National Monarch Candidate Conservation Agreement with Assurances (Monarch CCAA) for Energy and Transportation Lands and received their Certificate of Inclusion in Nov of 2020. By signing the agreement, the Oklahoma Department of Transportation joined 21 other Energy and Transportation organizations in voluntarily committing to implementing monarch conservation measures on a portion of their organization's managed lands.

The monarch butterfly was petitioned for listing under the Endangered Species Act (ESA) in 2014. In December of 2020, the US Fish and Wildlife Service (USFWS) decided to list the species as a candidate for an Endangered listing. In anticipation of a listing decision ODOT along with other national partners has committed, through the CCAA, to adopt acres within their land system for targeted conservation measures that will provide needed habitat for the monarch butterfly and that could potentially influence the future listing decision. This agreement provides immediate regulatory certainty to ODOT and avoids potential gaps in regulatory coverage in the event the species is listed.

During the 2022 Monarch season, ODOT developed educational materials for outreach tabling events such as Earth Day and the Monarchs in the Park Festival celebrating the fall monarch migration with local partners. In March of 2023, ODOT was recognized by US Fish and Wildlife Service for the early adoption of conservation practices for the Monarch CCAA and was one of two Departments of Transportation recognized by the Monarch CCAA for innovative implementation of the program.

Through conservation moving and brush management practices ODOT manages 2,249 acres of state transportation land system right-of-way corridors to benefit the monarch butterfly migration.

Collection and Recycling

ODOT's Maintenance personnel recycled 300lb of used oil filters, 1085 gallons of used oil, 55 gallons of gasoline, 110 gallons of used antifreeze. There were 3,540 gallons of oil and water mixture and 74,500 pounds of used tired recycled.

OKLAHOMA
Turnpike Authority

September 8, 2023

Mr. Jacob Hagen
Stormwater Quality Manager,
Stormwater Department, City of Tulsa
4502 S. Galveston Ave.
Tulsa, Oklahoma 74107

Dear Mr. Hagen:

Enclosed is the Oklahoma Turnpike Authority's portion of the Annual Report to be submitted to the Oklahoma Department of Environmental Quality (DEQ) in accordance with the City of Tulsa Municipal Separate Storm Sewer System (MS4) Permit Number OKS000201. This report covers the period from July 1, 2022 through June 30, 2023.

Please provide this office with one copy of the Annual Report as it is submitted to DEQ.

Sincerely,

Darian L. Butler, P.E.
Director of Engineering

OKLAHOMA
Turnpike Authority

NPDES Permit No. OKS000201
July 1, 2022 through June 30, 2023
Annual Report for
Oklahoma Turnpike Authority (OTA)

Overview

This report summarizes the OTA stormwater management activities for Turnpike areas in the City of Tulsa Municipal Separate Storm Sewer System (MS4) area. The Creek Turnpike Maintenance yard and approximately 29% of the Creek Turnpike roadway are within Tulsa's MS4 boundary. The roadway areas include 5.7 miles of roadway in the south Tulsa area that crosses parts of the Vensel Creek, Fry Ditch, and Haikey Creek watersheds. The roadway areas also include 4 miles in the east Tulsa area that crosses parts of the Spunky Creek and Adams Creek watersheds. The Creek Turnpike statistics shown in the remainder of this report refer to the entire Creek Turnpike, not just the portions that are in the Tulsa MS4 area.

1. Status of the Implementation of the Storm Water Management Program.

   Responsibilities of OTA outlined in the NPDES Part 2 Application have been met.

   Structural Controls and Storm Water Collection System Operations:

   OTA's commitment to a superior functioning storm water system is demonstrated by its regular inspections all of the below ground storm water carrying structures. All stormwater structures on the Creek Turnpike within the Tulsa MS4 area will be inspected in 2023.

   Above ground storm water controls are monitored daily by the maintenance staff who are equipped to handle any flow problems that could potentially arise. Examples of

such controls would be detention areas, roadside ditches, and culverts. To ensure the storm water is flowing efficiently, OTA mows 4 to 7 cycles per season (5 cycles were mowed this reporting period). Approximately 1641 acres are mowed per cycle.

Areas of New Development and significant redevelopment:

A five (5) year capital plan has been developed by the Turnpike Authority to identify future construction projects. This Capital Plan is updated yearly to incorporate priority areas and any lessons learned are incorporated into future projects. OTA shall continue to look for opportunities to use low impact development and adopt Best Management Practices to minimize the impact that runoff discharges have to receiving streams.

Roadways:

All storm grates and drains used to move water off of the roadway were cleaned quarterly during this period.

OTA requires a storm water management plan for all construction projects. The OTA requires contractors to obtain necessary permits for placement of dredge or fill material (from the US Army Corps of Engineers) as well as floodplain and watershed permits (from relevant municipalities).

Approximately 750 cubic yards of litter were collected and properly disposed of by Creek Turnpike Maintenance staff.

Finally, OTA Maintenance covers sand piles at Creek Turnpike Maintenance yards with tarps to prevent sand from washing off in the rain or from the wind.

Pesticide, Herbicide, and Fertilizer Application:

The OTA requires all turnpike herbicide applicators as well as all contract applicators to be licensed and subject to all of the regulations under the Oklahoma Herbicide Applicators Law including re-certification. Applicators receive yearly training on pesticides, herbicides, and fertilizer chemicals from the Oklahoma Vegetation Management Association (OKVMA). The OTA has seven certified applicators on the Creek Turnpike. Approximately 513 gallons of herbicide were applied around sign footings, fences, center median and at various other locations within the limits of the right of way.

Illicit Discharge and Improper Disposal:

The bridges and culverts on the Creek Turnpike are inspected every other year. The next round of inspections will take place during the 2023 annual report period.

OTA's maintenance staff collects and recycles oil. The oil is picked up twice a year at the maintenance yard by a private contractor. Batteries and tires were returned to locations where new ones could be purchased. For this reporting period OTA recycled 280 gallons of oil, 174 filters, 48 tires, and 42 batteries.

Construction Site Runoff:

The OTA understands the significance of construction site runoff and the adverse effects it can cause. As a result, strict guidelines are set forth to ensure that each construction site has adequate controls for reducing pollutants. As stated previously, all construction plans that are produced by or for the OTA have a mandatory Storm Water Management Plan and Erosion Control Plan.

These sheets provide information such as location/description of project, sequence of erosion control activities, area disturbed, name of receiving waters, soil stabilization practices, structural practices, offsite vehicle tracking, a layout drawing showing exactly where soil stabilization and structural practices should be placed, and references to the ODOT Standard Specification for all Storm Water Guidelines. The most optimal approach and recommendations are discussed and agreed upon prior to project implementation to ensure the best option is chosen for the project.

During construction, the approved storm water management plan is monitored and enforced regularly by the OTA's on-site representative. Upon project completion, OTA conducts a final inspection and assures that the work areas are restored to compliance level.

Public Education:

The OTA dedicates space on its website to the subject of Storm Water Management. On the site there are links to the Phase I Annual Reports. The site includes a phone number to allow the public to contact OTA with suggestions, comments, or questions about OTA's stormwater program.

A stormwater pollution prevention bookmark was produced which included 10 suggestions for preventing stormwater pollution. This bookmark was distributed to members of the public at OTA headquarters and other locations. The bookmark can also be seen by going to OTA's website.

The OTA is also part of the anti-litter campaign, "Oklahoma Keep Our Land Grand." As part of this campaign, the OTA offers a toll-free number to call to report littering as well as a place to report it on the website. Individuals who are reported littering are sent a postcard to remind them that littering is a punishable offense and that the goal is

to keep Oklahoma land looking grand. For the period July 1, 2022 – June 30, 2023, the Oklahoma Transportation System (including OTA and ODOT) received 394 littering report calls for the whole system.

Landscape:

OTA partners with the organization "Up With Trees" to landscape areas in and around the major interchanges in the Tulsa and Broken Arrow communities. OTA also partners with "Color Oklahoma" and maintains two wildflower plots on the right of way adjacent to the Creek Turnpike.

2. Proposed Storm Water Management Program Changes.

   The OTA is planning to be a co-permittee with ODOT in a non-traditional MS4 permit. OTA's current Storm Water Management Program (SWMP) will be replaced by a joint ODOT/OTA SWMP.

3. Revision to the Assessment of Controls and the Fiscal Analysis.

   OTA proposes no revision to the assessments of controls. The Fiscal Analysis is as shown on the City of Tulsa's Report.

4. Monitoring Data Accumulated Throughout the Reporting Year.

   Refer to the Regional Storm Monitoring Report.

5. Annual Expenditures for the Reporting Period with a Breakdown for the Major Elements of the Storm Water Management Program.

Description	Cost
Inspection	12,500.00
Mowing	131,551.94
Sweeping	49,953.50
Trash Collection and Disposal	152,881.46
Herbicide	18,721.66
Total	$ 365,608.56

6. A Summary Describing the Number and Nature of Enforcement Actions, Inspection and Public Education Program.

   All enforcement actions in OTA's watershed are issued by the City of Tulsa in concurrence with the OTA. None occurred during the year covered by this report.

7. Identification of Water Quality Improvements or Degradation.

   OTA was not able to identify any water quality improvements or degradations during this report period.

8. Regional Monitoring Report.

   Please see the City of Tulsa's report.

9. June 18 Storm Response.

   Crews from the OTA spent two weeks helping remove debris caused by the June 2023 storm event in Tulsa.

CERTIFICATION

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 who manage the system or those persons directly responsible for gathering 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.

Darian L. Butler, P.E.
Oklahoma Turnpike Authority

09/11/2023
Date