



# 2024 Annual Report

For the period of July 1, 2023 - June 30, 2024

Prepared by:

**City of Tulsa Public Works Department**  
Stormwater Maintenance and Operations



Save  
Our  
Streams



# Annual Report



OPDES Stormwater Permit #OKS000201  
July 1, 2023 to June 30, 2024

## **Co-Permittees:**

Oklahoma Turnpike Authority

Oklahoma Department of  
Transportation

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CERTIFICATION STATEMENT  
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

10.14.24

\_\_\_\_\_  
Date

Section 1 – Status of Implementing the Stormwater Management Program

## 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, 2023 through June 30, 2024, 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	1,658 acres	Mowing	13 x/year of mowable property (totaling 21,554 acres)
Channels & Streams/ Detention Ponds (Conger Contractor TAC 295)	1,510 acres	Weed control (Herbicide)	All parcels 3 x/year for broad leaf weed control (totaling 4,530 acres)
Maintenance Trails (Conger Contractor TAC 295)	27.8 miles	Weed control (Herbicide)	All trails 6-7 x/year for all vegetation control (totaling 166.8 miles)
Channels & Streams (Conger Contractor TAC 100)	452 acres	Weed Control (Herbicide)	All parcels 6 x/year for growth control (totaling 2,712 acres)
Channels & Streams (Inhouse)	345.5 acres	Weed Control (Herbicide)	All parcels 4 x/year for growth control (totaling 1,382 acres)

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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)	28,555 cubic yards/period
Roadside Ditches	978 miles	Sediment Removal (Roadside Ditching)	31,946 linear feet/period

**Maintenance of Below Ground Stormwater Structural Controls**

<b>BELOW GROUND STRUCTURE(S)</b>	<b>INVENTORY (FOR REPORTING PERIOD)</b>	<b>OPERATIONS &amp; MAINTENANCE (O&amp;M) ACTIVITY</b>	<b>O&amp;M ACTIVITY (COMPLETED EACH REPORTING PERIOD)</b>
Storm Sewer Pipe (all pipe - driveway pipe, crossover pipe, etc...)	1,322 miles	Inspect Flush/clean Repair or Replace	8.9 miles/period 30.9 miles/period 1,934 linear feet units/period
Catch Basin/Inlets	42,602 units	Inspect & Clean Repair	3,048 units/period 107 units/period
Pump Station	14 units	Clean interior, Inspect & Maintain	548 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

Section 1 – Status of Implementing the Stormwater Management Program

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 2023 with guidance from many groups, including Stormwater Quality and Engineering Services - Stormwater Design Section. See summary below:

*Per Oklahoma State Statutes, cities should develop and adopt comprehensive plans to provide guidance in bringing about a coordinated physical development in accordance with the present and future needs of their residents; to conserve natural resources; to ensure the efficient expenditure of public funds; and to promote the health, safety, convenience, prosperity, and welfare of the people in the area.*

*Planitulsa is the comprehensive plan for the City of Tulsa. The previous plan had been adopted in 2010 and a progress report released in 2016 showed that 74% of the 2010 planitulsa action items were identified as In Progress, Ongoing, or Complete. In 2019, the Tulsa Planning Office took on the task of updating planitulsa. More than 5,000 Tulsa residents contributed, 200 subject matter expert organizations were engaged, and more than 30 comprehensive plans were studied. The update to planitulsa was adopted in June of 2023.*

*The updated planitulsa is divided into ten chapters with the chapters on Future Land Use, Parks & Recreation, Environment & Natural Resources, and Public Services being the most relevant for guidance related to stormwater and environmental outcomes. Subject matter experts were consulted from a broad range of fields including water, flooding, wildlife & habitats, pollution, and sustainability. Recommendations included protecting Tulsans from flood events, protecting and enhancing wildlife habitats, seeking new forms of energy, managing waste and pollution in ways that do not negatively affect residents or the environment, and updating the 2011 Sustainability Plan with goals and metrics to monitor progress.*

*Various Departments within the City of Tulsa are working on ways to implement the plan through priority identification and alignment, building partnerships, allocating resources, and seeking new funding sources. Planning staff is also developing a system to facilitate navigation and track plan implementation. The system will be launched in 2025*

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,

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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 has 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 had recently undergone a review and was finalized in 2023 with input from Stormwater Quality. This document provides direction and goals for various elements of Tulsa’s growth and development. Language was added that

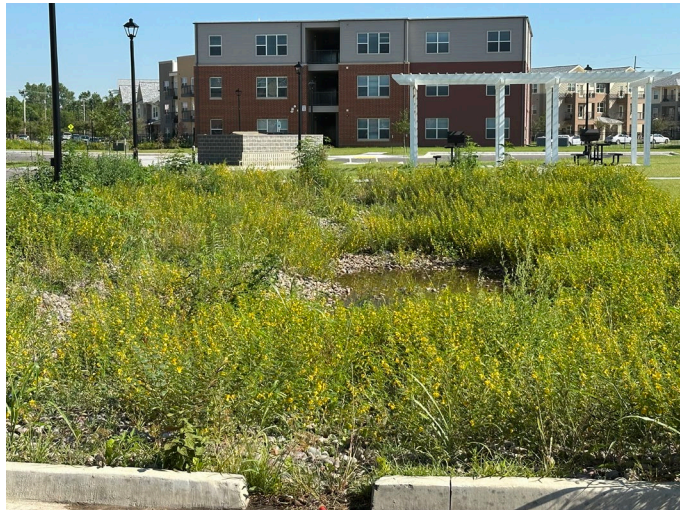


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promoted the recreational use of waterways, maintaining high water quality, LID, and adding increased enforcement efforts to developments and erosion control.

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 will be completed by the milestone set in the new Permit. 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 31 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 an updated “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

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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<sup>3</sup> 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
<b>Arterial</b>	~8x annually	12	8,559 miles	5,001 yds <sup>3</sup>
<b>Residential</b>	~4x annually	4	10,770 miles	31,801 yds <sup>3</sup>

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.

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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	4,562 bags	432.44 tons

Due to a change in the contractor for the City landfill, it is no longer possible to differentiate the litter collected by different crews used by Security in their various litter programs. The above info represents all the tons of material disposed of through their programs throughout the year, as opposed to in the past, when the metrics reported were more specific to that work group.

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.

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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

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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 Best Management Practices (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.

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**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 are available at 4508 E. Mohawk Blvd upon request.

Oct. 2023 – OKVMA

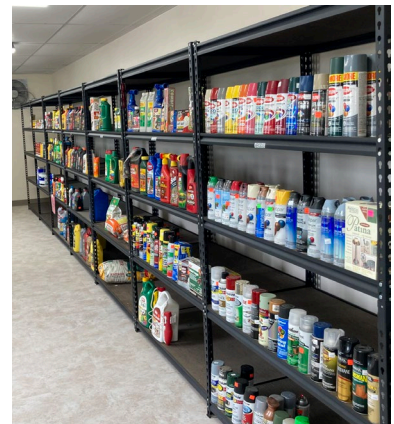
Nov. 2023 - OTRF

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 15<sup>th</sup>, accessing the website [www.tulsamastergardeners.org/](http://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



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Life” newsletter in the month of July 2023 and January 2024. 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](http://www.cityoftulsa.org/sos) and is regularly promoted. The number of pageviews during this year 3,089 which was 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.

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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 policies were implemented to ensure public health and safety and reduce the release of pollutants.

During this reporting period 256 investigations were conducted identifying 44 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. Thirty 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, “Runoff Card” 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.



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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 3,500 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 238 service requests, 87 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 July and November of 2023 and January 2024. 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.

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**b.) Sanitary sewer overflows**

In a continuing effort to eliminate sanitary sewer overflows during this reporting period, the City initiated 15 sanitary sewer manhole and/or pipeline rehabilitation projects. Eleven sanitary sewer evaluation studies were initiated and six were completed during this reporting period. Two 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. Ten sewer lines were repaired/rehabilitated under these programs in the past fiscal year.

Sewer cleaning crews specifically targeted 87.7 miles of sewer lines known for grease accumulation problems. This maintenance program reduced the likelihood of sanitary sewer backups and overflows. Emergency cleaning of 34.6 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.

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

<b>Action</b>	<b>Results</b>
<b>Businesses Inspected</b>	1,418
<b>FOG Trainings Conducted</b>	2 trainings 150 attendees
<b>Businesses Participating in the FOG Program</b>	543
<b>Samples Obtained</b>	17
<b>Number of Enforcement Actions</b>	7
<b>Fines Issued</b>	\$0

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

<b>Television Network</b>	<b>Frequency (# times aired)</b>	<b>Impressions (# views)</b>
KOTV Channel 6	28	70,980
KJRH Channel 2	26	65,910
KTUL Channel 8	31	78,585
KOKI Channel 23	78	197,730
KQCW Channel 19	18	45,630

In addition to television, the FOG program ran radio advertisements 261 times for a total of 91,555 impressions with an average frequency of 4.4%. The commercials ran over 4 weeks with a 30 second radio commercial. We also had outdoor billboards targeting a radius around key overflow locations within the city of Tulsa. The total number of billboards was 8 with the number of weekly impressions was 947,386.

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 ‘Environmental Exposition’ booths that had 500 people attend where grease related promotional items were distributed. A Fryer Oil Collection Event was held which collected 25 gallons of fryer oil for proper disposal from 45 participants. FOG

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education events were set up at community events and had approximately 13,140 visitors to the different Trap the Grease Events.

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:

- 198.6 miles of sanitary sewer TV inspected
- 208 sanitary manholes raised to grade
- 129 main line sanitary sewer repairs
- 15,846 feet of main line sanitary sewer replaced or rehabilitated

In addition to investigating the private sewer defects located through smoke testing, the smoke 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 2023 – 2024, the smoke inspectors investigated and closed 217 cases. Approximately 430 cleanout caps/plugs were replaced that were found during inspections and investigations.

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 74. This is 1% decrease from the prior year and in line with the long-term average. 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* – Held during the entire month of April 2024. 789 volunteers removed 419 bags of litter from 30 locations across the City of Tulsa. Not only did this clean-up remove litter from creeks, parks, and other stormwater facilities, it also helped to bring attention to the importance of reducing litter discharges to urban streams and waterways. The continued strong number of participants may be due to the new format allowing citizens to participate for the whole month of April. This was the fourth year of this format and every year the number of participants has been significantly higher than previous years when the

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event was held on a set date at a single location. A dashboard was created 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.

- *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.

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 7<sup>th</sup> – 10<sup>th</sup> 2024
- Tulsa State Fair: September 28<sup>th</sup> – October 8<sup>th</sup> 2023
- Build My Future Event: November 1<sup>st</sup> 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. 114,718 Tulsans participated which has resulted in the collection of 19,846.47 tons of recyclables for this reporting period. This program is promoted on the city website.

Environmental educational activities were conducted at 21 events. Combined these events involved approximately 2,007 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



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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. One 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:

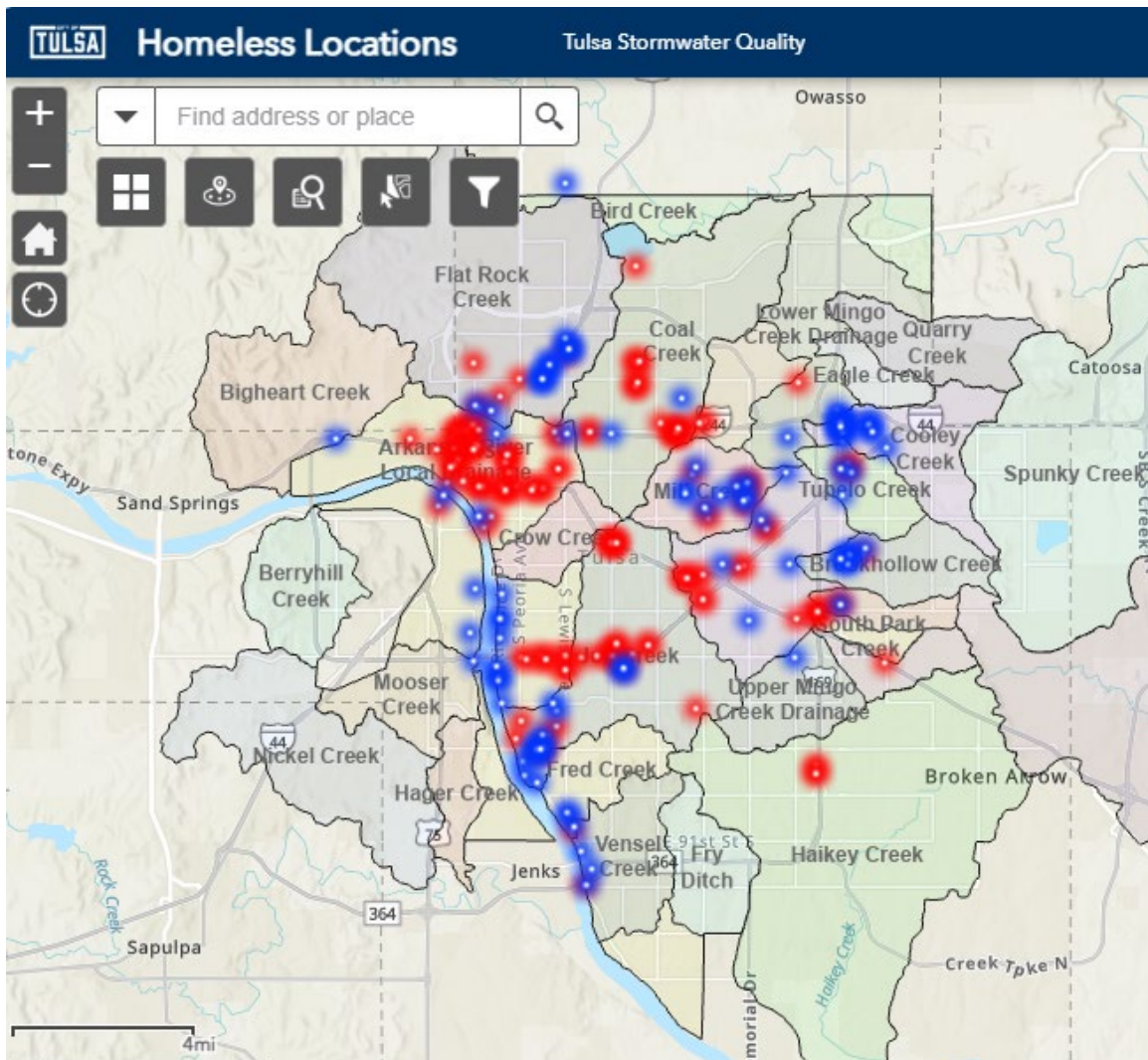
- 226 litter inspections
- 6,352 total sq ft. of litter directed to be cleaned-up
- Five Notices of Violation

An additional litter inspector was added during this FY, and in the future additional inspections and enforcement should follow as this employee gets fully into their tasks. 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.

A breakdown of the amount of hours and amounts of litter associated with homeless camp cleanup, primarily on City of Tulsa Stormwater Maintenance and Operation property is below. Additionally, GIS maps are being utilized to track the locations of these camps. Further analysis will be used in future years to determine how resource intensive the issues with homeless and litter have become and if additional work groups are needed to assist in this area:

FY 23-24	Number	Hours	Total Cubic Yards Cleaned
Homeless Debris Removal	27	280	3,892
Homeless Camp Inspections	44	32.25	NA

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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,

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including brochures and environmental events posters. Additionally, the M.e.t. distributed approximately 3,964 car litterbags, displayed anti-litter posters at the depots and at booths throughout the year and on Facebook and Instagrams. The M.e.t. supplied trash bags and gloves for groups like Tulsa and Union Elementary Schools, who have picked up litter. In FY 23/24, the M.e.t. provided these items for about 35 groups. In addition, the M.e.t. staff had about 116 educational booths, as well as giving 114 speeches to school classrooms and scouting groups on trash, recycling and litter.

Tulsa Parks emptied approximately 1,150 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 884 hours collecting 281 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 trash from along Tulsa's' roads, though recently with a change in disposal contractors, the number of bags disposed of through this program is unavailable.

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 1,202 tons of trash through the placement of thirty cubic yard trash dumpsters in neighborhoods in Tulsa, 547 times. Tulsa had 15,148 requests by citizens to pickup bulky waste (appliances, white goods, furniture) of which approximately 61 lbs of Freon from Freon bearing items were properly evacuated. In addition, 50 lbs of latex paint were picked up with the curbside bulky waste program from 35 requests.

The Solid Waste Program uses the visual observation efforts of various field officers and



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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 78 illegal dumpsites and conducted 599 investigations of illegal dumpsites within the city limits. Fourteen 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 320 tons of debris from these dumpsites.

City of Tulsa Security also was involved in approximately 1,250 homeless encampment removal and cleanup efforts. Nationwide populations of unhoused individuals has

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increased and Tulsa is seeing a rise in these same populations with various side effects 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 3,060 bags of trash
- Center of Employment Opportunities program cleaned up trash and limb debris from the Right of way as well as removed and trimmed green waste from roadways and side walks. Again due to the landfill contractor switching, specific metrics from this group are not available.
- Community service crews removed 158 bags 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	24,007 gals
Antifreeze	1,530 gals
Plastics	301,867 lbs.
Aluminum	213,070 lbs.
Glass	646,985 lbs.
Batteries	18,374 LA batteries 29,374 Household
Mix Paper, Newspaper and Cardboard	2,488,766 lbs.
Cooking Grease	2,753 gals

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Additionally, The M.e.t. conducts special collection events and partnerships for 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:

**Tulsa Holberton E-waste Event**

Saturday, August 19, 2023, 8:00 AM to 1:00PM

**Fire Extinguisher & Smoke Alarm Event**

Friday, February 10, 2024, 8AM-1PM

**DEA Prescription Drug Take Back Event**

Saturday, October 28, 2023, 10:00AM-2PM

**Great Pumpkin Rescue Event**

Month of November 2023

**Wanted Used Cooking- Oil Fryer Oil Collection Event**

Friday, November 25, 2023

**Tulsa County South Tulsa Cleanup Event**

Saturday, February 17<sup>th</sup>, 2024, 8AM-1PM

**Fire Extinguisher & Smoke Alarm Event**

Friday, February 23<sup>rd</sup>, 2024, 8AM-1PM

**Big Spring Clean Event**

Saturday, March 2<sup>nd</sup>, 2024, 9AM-2PM

**Tulsa County LaFortune Park Cleanup Event**

Saturday, March 9<sup>th</sup>, 2024, 8AM-1PM

**Tulsa County Haikey Creek Cleanup**

Saturday, March 23, 2024, 8:00AM-1PM

**Fire Extinguisher & Smoke Alarm Event**

Friday, March 28, 2024, 8AM-1PM

**Tulsa County Bixby Cleanup Event**

Saturday, April 13, 2024, 8:00AM -1PM

**Broken Arrow Trash Bash, and Recycling Rally**

Saturday, April 20, 2024, 8AM-1PM

**Enviro Expo**

Wednesday, April 24, 2024, 11:00AM- 1:00PM

**Tulsa County, Glenpool Community Cleanup Event**

Saturday, April 27, 2024, 8:00AM-2:00PM

**DEA Prescription Drug Take Back Event**

Saturday, April 27, 2024, 10:00AM-2PM

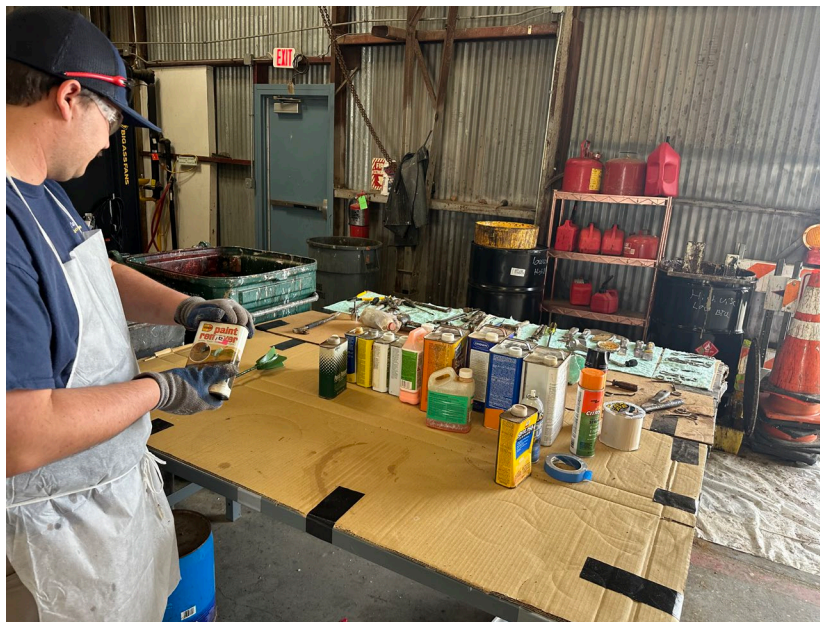
In FY 23/24, The M.e.t. Staff answered calls and emails from citizens who asked what to do with their pollutants. Staff educates people in where to take items and how to handle

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### Section 1 – Status of Implementing the Stormwater Management Program

responsibly. Staff gave out voucher numbers to citizens who live in outlying communities. This voucher number(s) allows citizens to use the City of Tulsa's Household Pollutant Collection 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 July and September 2023 and January and March 2024 utility bill stuffers. Plans are currently being discussed to comply with new permit requirements to open the Facility additional days. Preparations are being done to add space for future employees as well as Facility layout changes are being considered.



Below is a summary of the amounts of pollutants collected during this FY:

Total weight collected: 362,773 lbs

Total Tulsa customers: 3,380

Total M.e.t. customers: 582

Total Customers from outside Tulsa and M.e.t. communities: 65

A major shift from past years has been the publicity the Swap Shop received starting around Feb. of 2024 due to media coverage of that aspect of the facility. Compared to previous years, the Swap Shop has seen a 169% increase in pounds given away (20,111

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lbs. in FY 23/24) compared to the previous year of 7,472 lbs. This has been a benefit in that more product is being utilized for its manufactured purpose but has brought the unforeseen downside of more constantly drawing an employee away from servicing customers dropping off pollutants. In the future, investigations will be made to determine if additional personnel and days open are warranted.

The following is a breakdown of the wastestreams per category:

Wastestream	Amount Collected
Toxic Liquid	<b>14,180 lbs</b>
Toxic Solid	<b>9,536 lbs</b>
Aerosols	<b>8,812 lbs</b>
Low Viscous	<b>15,596 lbs</b>
High Viscous	<b>14,645 lbs</b>
Bulbs	<b>1,986 lbs</b>
Bases	<b>6,858 lbs</b>
Acids	<b>4,418 lbs</b>
Oxidizers	<b>2,564 lbs</b>
Flammable Loosepack	<b>14,543 lbs</b>

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

- 147,380 pounds of latex paint
- 2,235 pounds of used oil
- 575 pounds of antifreeze
- 7,732 lbs. of batteries
- 93 gallons of cooking oil



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e.) Locate and eliminate illicit discharges and improper disposal

Dry weather field screening was conducted on approximately 37.8 square miles (24,100.2 acres) of the Tulsa’s storm sewer system during the period of July 1, 2023 to June 30, 2024. 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 143 outfalls were screened, of which 46 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:

- 198.6 miles of sanitary sewer TV inspected
- 8.9 miles of storm sewer TV inspected
- 208 sanitary manholes raised to grade
- 1,934 linear feet of main line storm sewer repairs
- 129 main line sanitary sewer repairs
- 15,846 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).

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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. Forty-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

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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	<b>Construction</b> (relating to construction site potential violations)
11	<b>Hazmat</b> (relating to potential discharges of pollutants from fire department responses involving the hazardous materials unit)
224	<b>Stormwater</b> (relating to potential releases of pollutants to the storm sewer or violations of the Pollution Ordinance)
1	<b>Drug Labs</b> (relating to the potential release of pollutants from drug lab remediation to the storm sewer or violations of the Pollution Ordinance)
256	<b>Total number of investigations for this reporting year</b>

SMO inspectors conducted 465 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.



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**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.

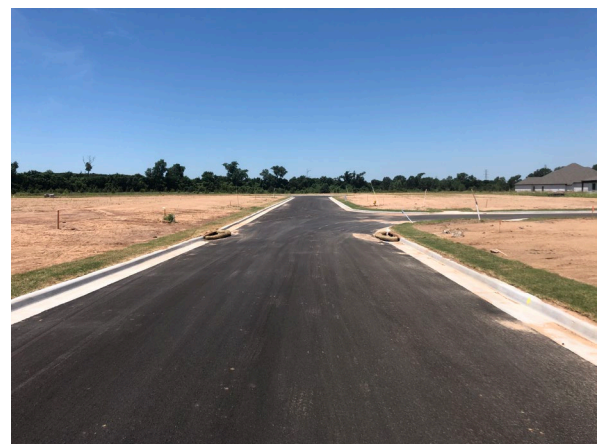
During this reporting period, 465 industrial stormwater inspections were conducted. Fourteen enforcement actions were taken against industries or facilities in order to eliminate illegal or illicit discharges. \$100 in fines was associated with these enforcement actions.

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



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Through inspections and enforcement actions, Tulsa required construction sites to implement and maintain adequate structural and non-structural BMP's during this reporting period. The use and maintenance of these BMP's 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:

33 Watershed Development permits, which include Earth Change permits.

100 Stormwater Drainage permits

918 Stormwater Connection permits

108 Floodplain permits

9 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, 66 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 1,297 construction site inspections for compliance with erosion control measures at 514 construction sites and issued 17 enforcement actions. The total amount of fines and penalties collected was \$950.

Development Services conducted 2,875 erosion control inspections at the same number of construction sites. Pre-construction erosion control inspections were conducted on all sites and this resulted in 113 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 97 city and 54 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

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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. 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 294 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 or Developers Council meetings held at the Greater Tulsa Home Builders Association as available.

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

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the correct installation of erosion control measures. City inspectors conducting soil erosion control inspections at construction sites informing 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.

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**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 1,971,285 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 40 messages to social media with stormwater messages this period. Tulsa’s social media has approximately 52,500 Facebook followers, 61,000 Twitter 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.



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

<b>Media</b>	<b>Impressions</b>
<b>Spotify</b>	1,120,075
<b>Pandora</b>	251,226
<b>Channel 2</b>	413,792
<b>Channel 8</b>	240,000
<b>Channel 6</b>	260,000
<b>Channel 23</b>	326,000
<b>KWGS Public Radio</b>	85,000
<b>OTT (Digital streaming adds)</b>	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](http://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

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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

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- 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 2023-2024”. Attachment B “Education Events 2023-2024” 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 2,650 hours of work to the Blue Thumb program’s activities. Tulsa County has the most streams monitored statewide. Eighteen 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



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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 2,904 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 August 2023, December 2023, and April 2024.

The City of Tulsa hosted a rain barrel sale May 3-4<sup>th</sup> and 10-11<sup>th</sup> which resulted in the sale of almost 200 barrels from 122 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, now Green Country Watershed Alliance is a group of environmental organizations and citizens with the shared goal of improving the water quality in Crow Creek and now across the greater Tulsa metro area. 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 250 citizens as well as printed and given out at many businesses in the watershed.

The Stormwater Quality group 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.

In the past, Stormwater Quality partnered with the City of Tulsa’s Working in Neighborhoods (WIN) department to further public education efforts. The WIN newsletter goes to approximately 500 neighborhoods and over 100,000 members on the Nextdoor app. This newsletter sometimes includes information on Stormwater Quality topics including upcoming educational events and programs.

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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 131 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 7,000 times. In total the Stormwater Quality group has produced 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, 2,956 pieces of literature were given out at these venues. Material was also distributed at events such as 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.

*“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

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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 July and November 2023 and January 2024 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](http://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 3,089 during this time another decrease from previous years. Though the main Stormwater Quality webpage visits were down, the Household Pollutant Collection Facility webpage visits were very strong with almost 10,000 visits. 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 with the City of Tulsa’s Parks Department during the month of April 2024. Volunteers removed litter from several different creek locations, such as Haikey Creek, Joe Creek, Mingo Creek, Dirty Butter Creek, Coal Creek, and Vensel 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 Save Our Streams social media pages posted ads promoting the Great Tulsa Cleanup as well as multiple media interviews were conducted and flyers handed out at events. The event continued its successful run with 789 participants who collected 419 bags of trash from 30 locations across Tulsa.

As a result of public awareness of the reporting of illicit discharges and improper disposal, 256 investigations were conducted involving the identification and removal of 44 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:

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*“Runoff Card” is a brochure given at various events and public facilities which discusses runoff from typical residents home, including motor oil, landscaping products, pet waste, and other common pollutants”*

*“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.*

The City of Tulsa has had a Household Pollutant Collection Facility at 4502 South Galveston Ave since 2016. 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 recycling centers. These handouts are given during speeches, booths and events. The website, [www.metrecycle.com](http://www.metrecycle.com) promotes

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the Household Pollutant Collection Facility and depots. (Fliers are distributed at booths, speeches and events throughout the year (see list below).

The following is a list detailing the quantity of materials the M.e.t. distributed:

FY 23/24 distribution estimates below:

Tulsa area Recycling Directory: 500

Buy Recycled, Close the Loop: 84

Latex Paint and the Environment: 225

Deep Green Clean: 384

Recycling Locations Map: 1630

Tulsa Green Steam: 530

Why Should I Recycle Batteries: 575

Where Should I Recycle E-waste: 1800

Focus on the Four: 3530

COT Medication Flier: 1400

Mercury in Your Home: 325

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 2,007 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

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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 62 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 including OKVMA in October 2023 and OTRF in November of 2023.

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](http://www.cityoftulsa.org/sos) and is regularly promoted.

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**Part II(A)(11) Employee Education**

*Status: Compliant and ongoing*

Education was conducted 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. Attendees are required to pass a test for certification. To date 214 employees have been certified. During this FY, 54 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 Statutes). 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.

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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:

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

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.



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**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 has recently completed the process of negotiating a renewal of Permit OKS000201. The permit changes the City of Tulsa has recommended are aimed at improving the performance of the Stormwater Management Program. All changes made in the requirements of the permit 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 forty-three outfalls were screened, covering approximately 24,100.2 acres (37.8 square miles). Of the 143 outfalls screened, 46 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:

<b>Total # of outfalls screened</b>	<b>143</b>
<b>Total area screened</b>	24,100.2 acres 37.8 sq. mi.
<b># of outfalls that did not require follow-up (without flow)</b>	67
<b># of outfalls with dry weather flows not requiring follow-up (flows present but pollutant concentration below action levels)</b>	46
<b># of outfalls requiring dry weather flow follow-up (flow with concentrations of pollutants above the action levels)</b>	4

## Section 4 – Summary of the Data

**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: 4800 W. 8th St.

Date	Floatables Present	Collection (Cubic Yards)	% Organic	% Inorganic
7/13/2023	no	0	0%	0%
8/7/2023	yes	1	100%	0%
9/11/2023	yes	1	80%	20%
9/20/2023	yes	0.25	90%	10%
9/22/2023	yes	0.5	50%	50%
10/5/2023	yes	0.25	90%	10%
10/12/2023	yes	0.5	90%	10%
10/24/2023	yes	0.25	30%	70%
11/20/2023	no	0	0%	0%
11/30/2023	yes	0.25	100%	0%
1/9/2024	no	0	0%	0%
1/22/2024	yes	0.75	90%	10%
2/5/2024	yes	1	100%	0%
3/24/2024	no	0	0%	0%
4/1/2024	yes	0.25	40%	60%
4/24/2024	no	0	0%	0%
4/30/2024	no	0	0%	0%
5/1/2024	yes	1.5	100%	0%
5/2/2024	no	0	0%	0%
5/6/2024	no	0	0%	0%
5/12/2024	yes	0.25	20%	80%
5/15/2024	yes	0.25	100%	0%
6/3/2024	yes	0.25	50%	50%
Total Cubic Yards		8.25		
Average Floatable Make Up (%)			75%	25%

Section 4 – Summary of the Data

**Floatingables Monitoring Summary**

Station: Osage Detention, 1101 West Pine Street

<b>Date</b>	<b>Floatingables Present</b>	<b>Collection (Cubic Yards)</b>	<b>% Organic</b>	<b>% Inorganic</b>
7/13/23	yes	0.25	20%	80%
8/7/23	yes	1	90%	10%
9/11/2023	yes	0.75	80%	20%
9/20/2023	no	0	0%	0%
9/22/2023	yes	1	70%	30%
10/5/2023	yes	26	50%	50%
10/12/2023	yes	0.5	100%	0%
10/24/2023	yes	0.25	30%	70%
11/20/2023	no	0	0%	0%
11/30/2023	yes	0.5	100%	0%
1/9/2024	no	0	0%	0%
1/22/2024	yes	0.75	90%	10%
2/5/2024	yes	0.5	90%	10%
3/24/2024	no	0	0%	0%
4/1/2024	yes	1.5	50%	50%
4/24/2024	no	0	0%	0%
4/30/2024	yes	2.5	90%	10%
5/1/2024	no	0	0%	0%
5/2/2024	yes	4	90%	10%
5/6/2024	yes	0.5	100%	0%
5/12/2024	yes	0.25	80%	20%
5/16/2024	yes	0.5	60%	40%
5/22/2024	yes	1.25	80%	20%
6/3/2024	no	0	0%	0%
Total Cubic Yards		24		
Average Floatingable Makeup (%)			75%	25%

Section 4 – Summary of the Data

**Floatables Monitoring Summary**

Station: Reed Park 4200 S. Union Ave.

<b>Date</b>	<b>Floatables Present</b>	<b>Collection (Cubic Yards)</b>	<b>% Organic</b>	<b>% Inorganic</b>
8/7/23	no	0	0%	0%
9/11/23	no	0	0%	0%
9/20/2023	no	0	0%	0%
9/22/2023	no	0	0%	0%
10/5/2023	no	0	0%	0%
10/12/2023	no	0	0%	0%
10/24/2023	no	0	0%	0%
11/20/2023	no	0	0%	0%
11/30/2023	no	0	0%	0%
1/9/2024	no	0	0%	0%
1/22/2024	yes	2.5	100%	0%
2/5/2024	no	0	0%	0%
3/24/2024	no	0	0%	0%
4/1/2024	no	0	0%	0%
4/24/2024	no	0	0%	0%
4/30/2024	no	0	0%	0%
5/1/2024	no	0	0%	0%
5/2/2024	yes	2.5	80%	20%
5/6/2024	no	0	0%	0%
5/12/2024	no	0	0%	0%
5/16/2024	no	0	0%	0%
5/22/2024	no	0	0%	0%
6/3/2024	no	0	0%	0%
Total Cubic Yards		5		
Average Floatable Makeup (%)			90%	10%

Section 4 – Summary of the Data

**Floatables Monitoring Summary**

Station: Sheridan Park,10400 South 67th East Avenue

<b>Date</b>	<b>Floatables Present</b>	<b>Collection (Cubic Yards)</b>	<b>% Organic</b>	<b>% Inorganic</b>
8/7/2023	no	0	0%	0%
8/14/2023	yes	0.25	100%	0%
9/11/2023	yes	0.25	100%	0%
9/20/2023	yes	0.25	100%	0%
10/5/2023	yes	0.25	100%	0%
10/12/2023	yes	0.25	90%	10%
10/24/2023	yes	0.5	100%	0%
10/28/2023	yes	0.25	100%	0%
11/20/2023	no	0.25	100%	0%
11/30/2023	yes	1	100%	0%
1/9/2024	no	0	0%	0%
1/22/2024	yes	1	100%	0%
2/5/2024	yes	0.25	100%	0%
3/24/2024	yes	0.25	100%	0%
4/1/2024	yes	0.5	100%	0%
4/24/2024	yes	0.25	100%	0%
4/26/2024	yes	0.25	100%	0%
4/27/2024	yes	0.25	100%	0%
5/1/2024	yes	0.25	100%	0%
5/2/2024	no	0	0%	0%
5/3/2024	yes	0.25	0%	100%
5/6/2024	no	0	0%	0%
5/12/2024	yes	0.25	100%	0%
5/16/2024	no	0	0%	0%
5/22/2024	yes	0.25	100%	0%
6/3/2024	yes	0.5	100%	0%
<b>Total Cubic Yard</b>		<b>7.5</b>		
<b>Average Floatable Makeup (%)</b>			<b>95%</b>	<b>5%</b>



Section 4 – Summary of the Data

**Floatables Monitoring Summary**

Station: Vensel Creek 11100 S. Yale Ave.

<b>Date</b>	<b>Floatables Present</b>	<b>Collection (Cubic Yards)</b>	<b>% Organic</b>	<b>% Inorganic</b>
8/14/23	yes	0.25	80%	20%
9/11/2023	yes	0.5	80%	20%
10/5/2023	yes	1	90%	10%
10/28/2023	yes	0.25	100%	0%
11/20/2023	no	0.25	100%	0%
1/22/2024	yes	1.25	100%	0%
2/5/2024	yes	0.25	100%	0%
3/24/2024	yes	1	90%	10%
4/1/2024	yes	1	100%	0%
4/6/2024	yes	1	100%	0%
4/24/2024	yes	1	90%	10%
4/26/2024	yes	1	100%	0%
4/27/2024	yes	0.5	100%	0%
5/2/2024	yes	0.25	100%	0%
5/3/2024	yes	0.25	100%	0%
5/12/2024	yes	0.25	100%	0%
5/22/2024	yes	1	100%	0%
6/3/2024	yes	1	90%	10%
Total Cubic Yards		12		
Average Floatable Makeup (%)			96%	4%

## **Watershed Characterization - Stream Monitoring Reports**



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**CITY OF TULSA  
WATERSHED CHARACTERIZATION PROGRAM**

**Comprehensive Watershed Characterization  
Assessment Year 3 (2023-2024):**

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

**September 30, 2024**

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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 Adams Creek, Brookhollow Creek, Center Creek, Coal Creek, Cooley Creek, Sugar Creek, Tupelo Creek and Upper Mill 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, 2024). 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, 2024). 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 2023 with completion in June of 2024 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.

<u>Waterbody</u>	<u>WBID</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Watershed Area (mi<sup>2</sup>)</u>	<u>Ecoregion</u>
Adams Creek	OK121500020150_00	36.093823	-95.784358	1.57	Central Irregular Plains
Brookhollow Creek	OK121300 Not Listed	36.122981	-95.837396	2.72	Central Irregular Plains
Center Creek	OK121500 Not Listed	36.144646	-95.761882	3.85	Central Irregular Plains
Coal Creek	OK121300010090_00	36.205937	-95.913396	9.24	Central Irregular Plains
Cooley Creek	OK121300 Not Listed	36.161995	-95.860218	6.14	Central Irregular Plains
Sugar Creek	OK121300 Not Listed	36.108273	-95.858529	1.92	Central Irregular Plains
Tupelo Creek	OK121300 Not Listed	36.151464	-95.861343	2.27	Central Irregular Plains
Upper Mill Creek	OK121300010050_00	36.150314	-95.890891	2.57	Central Irregular Plains

Table 1 - Sampling sites and locations



Sample location at Brookhollow Creek

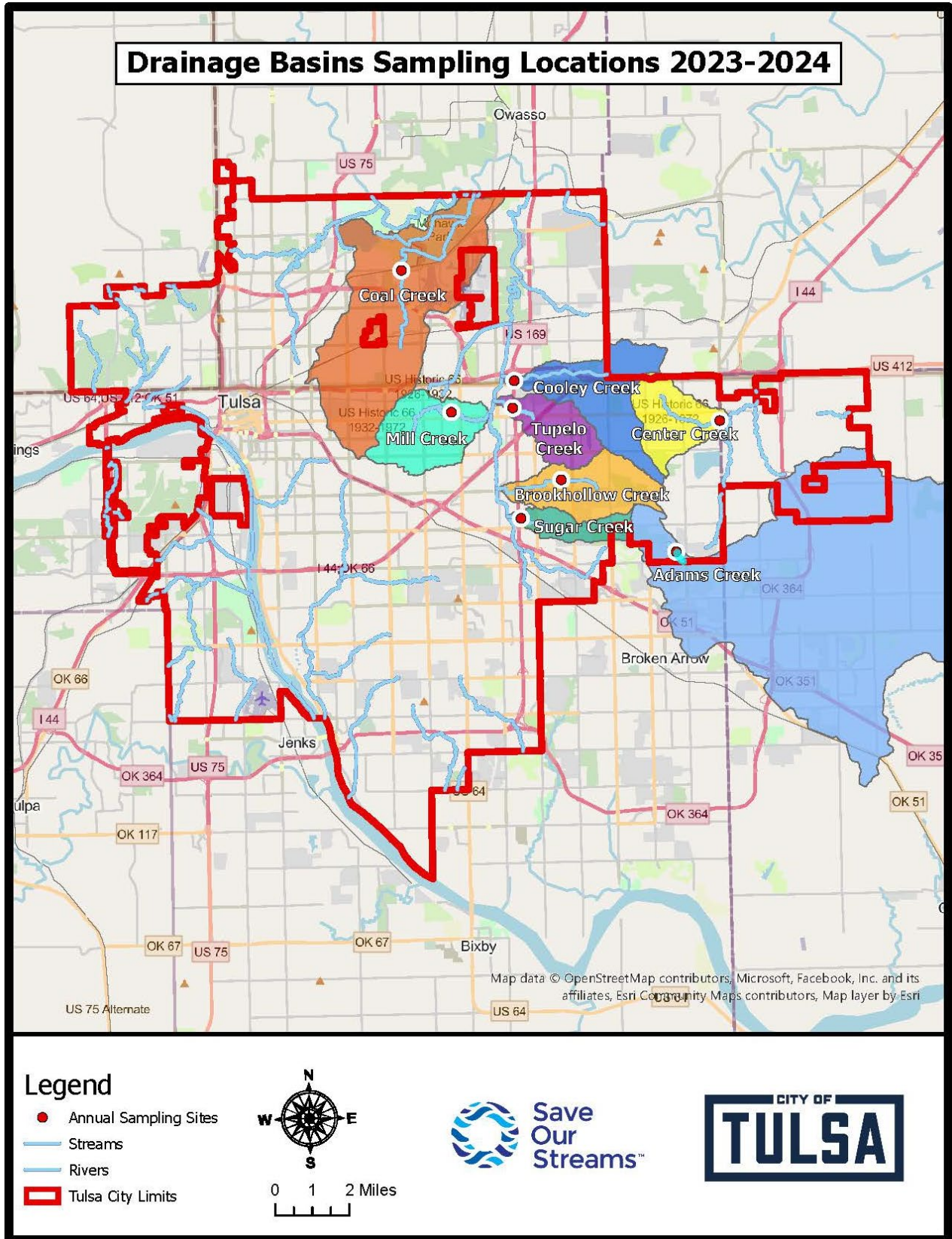


Figure 1 – City of Tulsa watershed map



## 2.0 BENEFICIAL USES

### 2.1 Agriculture

**2.1.1 Total Dissolved Solids** - Data collected on Total Dissolved Solids for the following streams indicates that the agricultural beneficial use is not supported for four of the creeks. 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.

<u>Waterbody</u>	<u>Sample Mean (mg/L)</u>	<u>Single Sample (mg/L)</u>	<u>Water Quality Standard (mg/L)</u>
Adams Creek	351	532	Sample: 456, Yearly: 350
Center Creek	301	475	
Brookhollow Creek	302	356	Sample: 470, Yearly: 387
Coal Creek	404	562	
Cooley Creek	360	401	
Sugar Creek	338	399	
Tupelo Creek	332	489	
Upper Mill Creek	483	643	

Table 2 – Total Dissolved Solids standards



Sample location at Adams Creek

## 2.2 Fish and Wildlife Propagation:

**2.2.1 Dissolved Oxygen** - Data collected on Dissolved Oxygen concentrations show that the beneficial use is not supported for six of the eight 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.

<u>Waterbody</u>	<u>Sample Mean (mg/L)</u>	<u>% of samples in exceedance</u>	<u>Water Quality Standard (mg/L)</u>
Adams Creek*	9.23	25%	April 1 – June 15: 6.0 June 16 – March 30: 5.0
Brookhollow Creek*	7.46	33%	
Center Creek*	6.42	50%	
Coal Creek*	8.60	42%	
Cooley Creek	8.16	33%	
Sugar Creek	9.96	8%	
Tupelo Creek*	7.24	33%	
Upper Mill Creek	8.20	8%	

Table 3 – Dissolved Oxygen standards



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.

<u>Waterbody</u>	<u>Parameter</u>	<u>Sample Mean (µg/L)</u>	<u>Single Sample (µg/L)</u>	<u>Water Quality Standard (µg/L)</u>
Adams 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	1.67	2.35	
	Lead	0.54	0.86	
	Zinc	10.00	10.00	
Center Creek	Cadmium	0.50	0.50	
	Copper	1.76	3.50	
	Lead	0.68	1.38	
	Zinc	10.08	11.00	
Brookhollow Creek	Cadmium	0.50	0.50	
	Copper	1.00	2.14	
	Lead	0.51	0.61	
	Zinc	10.00	10.00	
Coal Creek	Cadmium	0.50	0.50	
	Copper	1.54	3.32	
	Lead	1.03	6.16	
	Zinc	10.47	15.30	
Cooley Creek	Cadmium	0.50	0.50	Cd – Acute: 54.43, Chronic: 1.58 Cu – Acute: 28.65, Chronic: 18.40 Pb – Acute: 140.30, Chronic: 5.47 Zn – Acute: 167.79, Chronic: 151.97
	Copper	0.99	2.36	
	Lead	0.52	0.69	
	Zinc	10.15	11.80	
Sugar Creek	Cadmium	0.50	0.50	
	Copper	1.31	2.44	
	Lead	0.50	0.50	
	Zinc	10.00	10.00	
Tupelo Creek	Cadmium	0.50	0.50	
	Copper	1.63	4.03	
	Lead	0.72	2.75	
	Zinc	11.55	22.30	
Upper Mill Creek	Cadmium	0.50	0.50	
	Copper	1.60	3.64	
	Lead	0.93	3.04	
	Zinc	12.57	31.90	

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.

<u>Waterbody</u>	<u>Sample Range (s.u)</u>	<u>Water Quality Standard Range (s.u)</u>
Adams Creek	7.3 – 8.4	6.5 – 9.0
Brookhollow Creek	7.2 – 8.0	
Center Creek	7.1 – 8.2	
Coal Creek	7.4 – 8.1	
Cooley Creek	7.6 – 8.3	
Sugar Creek	7.5 – 8.4	
Tupelo Creek	7.5 – 8.1	
Upper Mill Creek	7.9 – 8.2	

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 Bedded Sediments** - Using habitat assessment data to determine support of the beneficial use is conditional upon the support of turbidity data and fish collection data (ODEQ, Chapter 740 Implementation of Oklahoma's Water Quality Standards, 2023b).

**2.2.5.1 Turbidity** – Data collected on Turbidity readings show full support of the beneficial use except for one creek. 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.

<u>Waterbody</u>	<u>Sample Mean (NTU)</u>	<u>% of samples in exceedance</u>	<u>Water Quality Standard (NTU)</u>
Adams Creek	16.27	0%	50
Brookhollow Creek	4.78	0%	
Center Creek	25.18	8%	
Coal Creek	10.77	8%	
Cooley Creek	5.83	0%	
Sugar Creek	4.71	0%	
Tupelo Creek	9.62	8%	
Upper Mill Creek	13.57	17%	

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.

<u>Waterbody</u>	<u>Instream Habitat</u>	<u>Pool Bottom Substrate</u>	<u>Pool Variability</u>	<u>Canopy Cover</u>	<u>Presence of Rocky Runs and Riffles</u>	<u>Flow</u>	<u>Channel Alteration</u>	<u>Channel Sinuosity</u>	<u>Bank Stability</u>	<u>Bank Vegetation Stability</u>	<u>Streamside Cover</u>	<u>Total Score</u>	<u>Mean Score</u>
Adams Creek	19.5	10.8	0.0	7.4	2.2	0.5	15.1	0.5	3.3	1.5	9.9	70.7	84.1
Brookhollow Creek	17.6	5.0	5.0	15.1	11.4	3.3	16.5	0.6	7.9	8.9	10.0	101.3	
Center Creek	19.4	3.8	7.1	20.0	0.0	0.3	7.7	0.5	6.9	4.1	10.0	79.8	
Coal Creek	19.6	11.5	6.1	15.8	13.3	2.9	7.7	0.5	4.1	2.2	10.0	93.7	
Cooley Creek	19.5	12.9	18.7	19.3	11.4	8.5	13.7	0.5	7.4	5.4	9.9	127.2	
Sugar Creek	18.9	5.5	0.0	19.4	10.3	2.5	7.7	0.5	6.8	4.1	10.0	85.7	
Tupelo Creek	19.6	3.4	4.1	2.5	4.1	3.4	5.8	0.5	4.1	10.0	5.0	62.5	
Upper Mill Creek	19.1	8.9	4.5	12.7	4.1	3.1	9.9	0.5	9.9	7.5	5.0	85.2	

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



Habitat assessment in progress

2.2.6 Biological

2.2.6.1 Fish Collections – Below is the data recorded from fish collections performed on the streams.

<u>Waterbody</u>	<u>Sample Composition</u>	<u>Fish Condition</u>	<u>Total Score</u>	<u>Score Key</u>
Adams Creek	14	11	25	30+ Beneficial Use Supported; 23 – 29 Undetermined; <22 Impaired
Brookhollow Creek	8	13	21	
Center Creek	8	11	19	
Coal Creek	16	11	27	
Cooley Creek	14	13	27	
Sugar Creek	10	15	25	
Tupelo Creek	6	11	17	
Upper Mill Creek	6	11	17	

Table 8 – Fish IBI scores



Orangespotted sunfish at Coal Creek

**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). Less than four macroinvertebrate samples were collected for Center Creek and Tupelo Creek due to dry conditions.

<u>Waterbody</u>	<u>Summer 2022 Score</u>	<u>Winter 2023 Score</u>	<u>Summer 2023 Score</u>	<u>Winter 2024 Score</u>	<u>Final Macroinvertebrate Assessment</u>
Adams Creek	55%	44%	55%	52%	Undetermined
Brookhollow Creek	45%	44%	58%	52%	Not Attaining
Center Creek	N/A	52%	N/A	44%	Undetermined
Coal Creek	65%	59%	52%	44%	Undetermined
Cooley Creek	39%	30%	52%	37%	Not Attaining
Sugar Creek	71%	67%	65%	59%	Undetermined
Tupelo Creek	39%	52%	N/A	67%	Undetermined
Upper Mill Creek	58%	37%	65%	44%	Not Attaining
>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*.

<u>Waterbody</u>	<u><i>E. coli</i> Recreation Sample Geometric Mean (MPN/100mL)</u>	<u><i>E. coli</i> Non-Recreation Sample Geometric Mean (MPN/100mL)</u>	<u>Single Sample (MPN/100mL)</u>	<u>Water Quality Standard (MPN/100mL)</u>
Adams Creek	756	66	13000	Recreational Period Geometric Mean: 126; Non-recreational Period Geometric Mean: 630
Brookhollow Creek	527	174	1990	
Center Creek	167	226	12000	
Coal Creek	251	340	8670	
Cooley Creek	273	201	4100	
Sugar Creek	413	158	1730	
Tupelo Creek	417	111	43500	
Upper Mill Creek	1454	401	19000	

Table 10 – *E. coli* totals

<u>Waterbody</u>	<u><i>Enterococcus</i> Recreation Sample Geometric Mean (MPN/100mL)</u>	<u><i>Enterococcus</i> Non-Recreation Sample Geometric Mean (MPN/100mL)</u>	<u>Single Sample (MPN/100mL)</u>	<u>Water Quality Standard (MPN/100mL)</u>
Adams Creek	1872	278	2420	Recreational Period Geometric Mean: 33; Non-recreational Period Geometric Mean: 165
Brookhollow Creek	993	315	8820	
Center Creek	649	227	2420	
Coal Creek	989	232	1730	
Cooley Creek	341	208	2420	
Sugar Creek	861	179	4350	
Tupelo Creek	708	126	9678	
Upper Mill Creek	1134	393	9680	

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 use. 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, 2024).

<u>Waterbody</u>	<u>Total Phosphorus Sample Mean (mg/L)</u>	<u>Nitrite - Nitrate Sample Mean (mg/L)</u>	<u>% of samples in exceedance</u>	<u>Water Quality Threshold (mg/L)</u>
Adams Creek	0.07	0.27	8%	Total Phosphorus: 0.24 Nitrate/Nitrite: 4.95
Brookhollow Creek	0.03	0.32	0%	
Center Creek	0.07	0.28	0%	
Coal Creek	0.05	0.43	8%	
Cooley Creek	0.05	0.35	0%	
Sugar Creek	0.04	0.44	0%	
Tupelo Creek	0.06	0.52	0%	
Upper Mill Creek	0.04	0.71	0%	

Table 12 – Nutrient totals

### 3.0 SUMMARY

The attainment of the agricultural beneficial use for Adams Creek, Coal Creek, Tupelo Creek and Upper Mill Creek was not met. The sample mean for Adams Creek was marginally higher than the yearly sample mean and only 8% of the samples exceeded the sample standard. Therefore, Adams Creek was very close to attainment of the agricultural beneficial use. Coal Creek, Tupelo Creek and Upper Mill Creek have all exceeded water quality standards for TDS in the past. Adams Creek, Brookhollow Creek, Center Creek, Coal Creek, Cooley Creek and Tupelo Creek were impaired for dissolved oxygen. These creeks have little to no flow for a portion of the sampling year with water temperatures over 20°C, with some temperatures reaching almost 30°C. Upper Mill Creek was the only creek that exceeded water quality standards for turbidity with two samples slightly exceeding the turbidity standard. One of the samples was taken within 72 hours of a rain event and the other sample taken just outside of 72 hours of a rain event. Adams Creek, Center Creek and Tupelo Creek had habitat scores below the average score for high quality sites. Adams Creek, Center Creek and Tupelo Creek are shallow creeks with very little flow creating shallow pools which impacts the pool variability metric score. If runs and riffles are present, less than fifty percent of the substrate is gravel, cobble or boulder, lowering the metric score for the presence of rocky runs and riffles. Fish collection scores show impairment for Brookhollow Creek, Center Creek, Tupelo Creek and Upper Mill Creek. Fish scores at Tupelo Creek and Upper Mill Creek have been impaired in the past and Brookhollow Creek was undetermined. Center Creek previously had a high fish score but multiple construction projects surrounding the Center Creek area is suspected of impacting Center Creek's fish score. Benthic macroinvertebrate collections indicate that Brookhollow Creek, Cooley Creek and Upper Mill 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. All sampled creeks exceeded the geometric mean for *E. coli*. Furthermore, all sampled creeks exceeded the geometric mean for *Enterococcus* for recreational period sampling and non-recreation period sampling except for Tupelo Creek.

ANALYTE	Adams Creek											
	7/12/23	8/15/23	9/19/23	10/16/23	11/7/23	12/5/23	1/18/24	2/20/24	3/13/24	4/8/24	5/21/24	6/11/24
BOD (5) Day (BDL 3) mg/L	3.7	15.0	3.1	3.0	3.6	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	136	403	795	426	465	439	231	467	504	422	409	584
Copper, Total (BDL 0.5) µg/L	1.66	2.35	1.59	1.52	1.75	1.21	1.44	1.34	1.61	1.94	2.32	1.28
Flow CFS	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.28	0.10	0.33	0.26	0.00
Hardness, Total (BDL 3.6) mg/L	150	110	260	200	190	240	180	280	220	210	150	230
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	0.65	0.86	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	1.46	3.17	0.74	0.78	0.91	0.76	0.76	0.50	0.77	0.69	0.81	0.87
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.20	0.33	0.27	0.22	0.53	0.20	0.24	0.27	0.30	0.22
Nitrogen, Total as N (BDL 0.5) mg/L	1.46	3.17	0.74	1.11	1.18	0.98	1.29	0.50	1.01	0.96	1.11	1.09
Oxygen Demand, Chemical (BDL 20) mg/L	35	51	33	20	26	20	25	20	26	24	20	21
Oxygen, Dissolved mg/L	4.18	8.15	2.42	7.68	11.47	12.92	15.41	14.89	11.46	9.75	8.38	4.04
pH (s.u.)	7.81	8.36	7.67	7.26	7.70	7.84	8.11	8.33	8.28	8.21	8.14	7.63
Phosphorus, Total (BDL 0.010) mg/L	0.070	0.294	0.066	0.044	0.052	0.035	0.051	0.038	0.042	0.061	0.086	0.040
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.029	0.035	0.031	0.030	0.024	0.160	0.016	0.013	0.017	0.021	0.024	0.016
Solids, Total Dissolved (BDL 10) mg/L	291	246	532	344	326	420	300	399	364	329	255	405
Solids, Total Suspended (BDL 2.0) mg/L	7.0	36.0	7.0	6.5	11.0	23.0	5.5	13.0	10.0	20.0	19.0	6.9
Temperature, Water °C	25.3	24.9	20.1	9.9	16.2	5.3	3.3	9.5	16.4	17.6	25.2	21.1
Turbidity (NTU)	8.49	47.30	3.79	8.95	10.20	5.10	12.30	14.20	15.10	22.60	35.40	11.80
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 13 – Complete analytical sampling results for all parameters for Adams Creek

ANALYTE	Adams Creek																	
	7/12/23	8/15/23	8/17/23	8/24/23	9/19/23	10/16/23	11/7/23	12/5/23	1/18/24	2/20/24	3/13/24	4/8/24	5/21/24	5/28/24	6/3/24	6/10/24	6/11/24	6/12/24
<i>E. coli</i> MPN/100mL	55	550	96	100	13000	52	110	178	39	3	179	261	1730	345	517	3590	3450	3180
<i>Enterococcus</i> MPN/100mL	980	820	2000	1400	2420	550	490	89	1050	184	98	285	2190	2420	2420	2420	2420	2420
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 Adams Creek

ANALYTE	Brookhollow Creek											
	7/18/23	8/21/23	9/21/23	10/17/23	11/6/23	12/6/23	1/24/24	2/14/24	3/19/24	4/9/24	5/15/24	6/13/24
BOD (5) Day (BDL 3) mg/L	3.0	3.0	4.2	3.0	3.3	5.1	3.0	3.0	16.0	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	480	553	304	420	476	345	298	337	380	308	534	499
Copper, Total (BDL 0.5) µg/L	0.90	0.86	2.14	0.84	0.87	0.62	1.94	0.66	0.66	0.76	0.91	0.79
Flow CFS	0.00	0.00	0.14	0.21	0.50	0.53	1.76	1.17	0.66	0.63	1.99	0.43
Hardness, Total (BDL 3.6) mg/L	210	200	130	230	240	250	220	150	250	240	280	210
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.61	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	0.72	0.57	0.74	0.50	0.50	0.50	0.63	0.50	0.50	0.50	0.50	0.52
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.21	0.20	0.20	0.20	0.92	0.77	0.20	0.20	0.35	0.21
Nitrogen, Total as N (BDL 0.5) mg/L	0.72	0.57	0.95	0.50	0.50	0.50	1.55	0.77	0.50	0.50	0.50	0.73
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	20	20	20	23	20	20	20	20	20
Oxygen, Dissolved mg/L	2.99	3.74	3.43	7.64	8.49	11.14	11.62	10.82	10.08	7.21	7.91	4.49
pH (s.u.)	7.54	7.56	7.55	7.23	7.48	8.02	7.80	8.01	7.97	7.83	7.95	7.67
Phosphorus, Total (BDL 0.010) mg/L	0.040	0.025	0.058	0.014	0.025	0.016	0.096	0.026	0.015	0.025	0.022	0.033
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.022	0.016	0.016	0.010	0.011	0.014	0.075	0.014	0.010	0.013	0.014	0.011
Solids, Total Dissolved (BDL 10) mg/L	266	284	185	293	316	313	354	356	331	302	333	286
Solids, Total Suspended (BDL 2.0) mg/L	7.3	5.5	9.2	9.9	9.0	2.5	4.1	2.5	2.6	3.6	2.5	9.1
Temperature, Water °C	26.6	29.0	22.3	13.3	16.9	6.3	3.2	7.2	8.4	17.2	17.8	24.3
Turbidity (NTU)	5.80	2.30	7.31	3.40	5.97	2.22	7.50	2.58	3.42	3.75	3.68	9.38
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 Brookhollow Creek

ANALYTE	Brookhollow Creek																	
	7/18/23	8/17/23	8/21/23	8/24/23	9/21/23	10/17/23	11/6/23	12/6/23	1/24/24	2/14/24	3/19/24	4/9/24	5/15/24	5/28/24	6/3/24	6/10/23	6/12/24	6/13/24
<i>E. coli</i> MPN/100mL	190	280	84	1700	370	140	200	63	866	96	102	326	921	866	921	260	816	1990
<i>Enterococcus</i> MPN/100mL	500	920	580	730	2420	1300	140	119	8820	65	72	345	2420	1990	1550	304	1990	435
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 Brookhollow Creek

ANALYTE	Center Creek											
	7/24/23	8/17/23	9/21/23	10/18/23	11/17/23	12/5/23	1/17/24	2/20/24	3/12/24	4/8/24	5/21/24	6/11/24
BOD (5) Day (BDL 3) mg/L	4.6	3.0	5.1	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	325	258	355	285	390	293	242	491	506	613	417	588
Copper, Total (BDL 0.5) µg/L	3.50	2.41	1.02	2.02	1.58	2.01	1.24	0.96	1.28	1.71	2.30	1.07
Flow CFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.20	0.00	0.25	0.00
Hardness, Total (BDL 3.6) mg/L	140	130	160	150	190	190	350	290	250	290	170	230
Lead, Total (BDL 0.5) µg/L	1.38	0.90	0.69	0.50	0.50	0.76	0.50	0.50	0.50	0.64	0.75	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	1.20	1.04	1.75	0.50	0.53	0.50	0.50	0.50	0.61	0.50	0.76	0.60
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.58	0.20	0.20	0.20	0.20	0.75	0.20	0.20	0.20	0.28	0.20
Nitrogen, Total as N (BDL 0.5) mg/L	1.20	1.62	1.75	0.50	0.53	0.50	0.75	0.50	0.61	0.50	1.04	0.60
Oxygen Demand, Chemical (BDL 20) mg/L	24	22	29	25	20	20	20	20	20	20	20	20
Oxygen, Dissolved mg/L	3.00	2.69	1.51	5.18	6.04	8.07	12.66	12.64	10.23	5.35	5.88	3.80
pH (s.u.)	7.68	7.52	7.47	7.13	7.46	7.85	7.81	8.18	8.02	7.86	7.79	7.76
Phosphorus, Total (BDL 0.010) mg/L	0.149	0.016	0.106	0.056	0.058	0.075	0.049	0.026	0.037	0.072	0.108	0.042
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.017	0.017	0.035	0.027	0.030	0.037	0.041	0.017	0.016	0.030	0.051	0.017
Solids, Total Dissolved (BDL 10) mg/L	205	179	221	195	254	261	475	450	385	433	241	316
Solids, Total Suspended (BDL 2.0) mg/L	45.0	36.0	21.0	11.0	11.0	26.0	5.9	5.8	8.9	20.0	3.1	12.0
Temperature, Water °C	26.1	23.4	22.5	12.6	16.2	5.5	0.8	6.1	12.1	16.1	23.0	25.3
Turbidity (NTU)	77.40	44.40	25.00	17.60	15.60	26.70	6.27	6.89	11.80	25.40	30.90	14.20
Zinc, Total (BDL 10) µg/L	11.00	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 17 – Complete analytical sampling results for all parameters for Center Creek

ANALYTE	Center Creek																	
	7/24/23	8/17/23	8/17/23	8/24/23	9/21/23	10/18/23	11/7/23	12/5/23	1/17/24	2/20/24	3/12/24	4/8/24	5/21/24	5/28/24	6/3/24	6/10/24	6/11/24	6/12/24
<i>E. coli</i> MPN/100mL	520	1400	120	25	26	12000	100	238	33	44	222	326	1300	111	308	108	88	120
<i>Enterococcus</i> MPN/100mL	2400	2420	1600	160	74	2420	130	365	130	55	98	387	2420	722	1120	345	125	921
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 Center Creek

ANALYTE	Coal Creek											
	7/11/23	8/17/23	9/19/23	10/23/23	11/2/23	12/4/23	1/17/24	2/13/24	3/18/24	4/15/24	5/28/24	6/10/24
BOD (5) Day (BDL 3) mg/L	3.0	3.0	3.0	3.0	3.0	8.3	6.5	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	422	500	502	623	502	319	319	717	537	620	806	693
Copper, Total (BDL 0.5) µg/L	1.34	1.84	1.22	1.05	0.97	1.35	3.32	1.88	1.48	1.29	1.38	1.33
Flow CFS	0.00	0.00	0.00	0.67	1.03	0.00	0.00	3.67	0.98	0.00	0.63	0.00
Hardness, Total (BDL 3.6) mg/L	190	220	240	320	340	240	200	250	290	280	350	310
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.50	0.50	0.50	0.50	6.16	1.19	0.50	0.50	0.50	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.61	0.50	0.50	0.50	0.50	3.44	2.48	0.57	0.50	0.50	0.73	0.50
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.39	0.20	0.20	0.73	0.20	0.61	0.90	0.24	0.20	0.92	0.39
Nitrogen, Total as N (BDL 0.5) mg/L	0.61	0.50	0.50	0.50	0.73	3.44	3.09	1.47	0.50	0.50	1.65	0.50
Oxygen Demand, Chemical (BDL 20) mg/L	25	20	20	20	20	20	30	20	20	20	20	20
Oxygen, Dissolved mg/L	3.78	4.63	5.98	6.09	11.00	14.33	20.31	11.86	10.42	4.76	5.13	4.94
pH (s.u.)	7.56	7.72	7.74	7.74	7.88	7.42	8.11	7.91	7.93	7.76	7.82	7.85
Phosphorus, Total (BDL 0.010) mg/L	0.035	0.047	0.039	0.034	0.025	0.030	0.265	0.039	0.017	0.028	0.032	0.031
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.023	0.035	0.029	0.023	0.015	0.018	0.116	0.014	0.011	0.015	0.023	0.024
Solids, Total Dissolved (BDL 10) mg/L	244	302	351	458	479	308	320	562	437	397	509	475
Solids, Total Suspended (BDL 2.0) mg/L	6.4	15.0	6.0	2.8	5.0	4.0	61.0	11.0	2.5	2.7	3.0	2.5
Temperature, Water °C	24.8	23.7	21.3	17.1	7.4	6.7	0.1	7.2	10.8	20.4	22.7	22.6
Turbidity (NTU)	3.25	5.20	4.53	1.61	3.33	2.82	84.10	13.60	1.75	2.56	3.30	3.20
Zinc, Total (BDL 10) µg/L	10.00	10.00	10.00	10.00	10.00	10.00	15.30	10.30	10.00	10.00	10.00	10.00
Results found to be below the detection limit are reported as the detection limit												

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

ANALYTE	Coal Creek																
	7/11/23	8/17/23	8/17/23	8/24/23	9/19/23	10/23/23	11/2/23	12/4/23	1/17/24	2/13/24	3/18/24	4/15/24	5/28/24	5/28/24	6/6/24	6/10/24	6/12/24
<i>E. coli</i> MPN/100mL	250	550	330	650	200	170	280	228	8670	148	201	186	138	141	345	121	210
<i>Enterococcus</i> MPN/100mL	1200	1400	1700	1600	820	370	340	80	659	86	111	579	1550	1730	549	649	249
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 Coal Creek

ANALYTE	Cooley Creek											
	7/20/23	8/16/23	9/20/23	10/18/23	11/13/23	12/6/23	1/25/24	2/19/24	3/18/24	4/15/24	5/14/24	6/17/24
BOD (5) Day (BDL 3) mg/L	3.0	3.0	4.5	3.0	3.0	3.4	3.0	3.0	6.1	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	600	609	439	535	521	427	490	421	430	590	535	644
Copper, Total (BDL 0.5) µg/L	1.49	1.05	2.36	0.65	0.54	0.58	1.29	0.79	0.64	0.73	1.11	0.62
Flow CFS	0.00	0.00	0.50	0.75	0.00	0.58	5.57	2.90	1.53	1.00	7.08	0.59
Hardness, Total (BDL 3.6) mg/L	260	290	230	300	310	300	290	300	280	280	270	280
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.69	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	0.56	0.55	0.83	0.50	0.50	0.50	0.51	0.50	0.50	0.50	0.56	0.50
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.28	0.37	0.20	0.25	0.20	1.20	0.41	0.23	0.20	0.41	0.20
Nitrogen, Total as N (BDL 0.5) mg/L	0.56	0.83	1.20	0.50	0.50	0.50	1.71	0.50	0.50	0.50	0.96	0.50
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	21	20	20	20	20	20	20	20	20	20
Oxygen, Dissolved mg/L	1.81	4.52	5.32	6.96	6.70	9.53	19.55	13.85	10.39	5.59	10.12	3.63
pH (s.u.)	7.61	7.73	7.71	7.73	7.58	8.02	7.98	8.17	8.02	7.72	8.26	7.64
Phosphorus, Total (BDL 0.010) mg/L	0.031	0.191	0.072	0.026	0.023	0.014	0.075	0.015	0.020	0.019	0.039	0.027
Phosphorus, Total Dissolved BDL (0.010) mg/L	0.017	0.162	0.032	0.013	0.014	0.010	0.057	0.013	0.014	0.014	0.027	0.016
Solids, Total Dissolved (BDL 10) mg/L	330	358	273	366	378	379	401	397	386	374	328	349
Solids, Total Suspended (BDL 2.0) mg/L	8.0	9.6	19.0	4.8	7.7	5.8	4.6	4.6	2.5	4.1	2.5	4.3
Temperature, Water °C	27.6	22.4	20.7	14.2	12.5	7.3	6.3	5.8	8.0	19.5	19.5	26.8
Turbidity (NTU)	4.51	5.13	19.20	8.00	2.08	2.33	9.44	4.69	2.84	4.04	2.77	4.96
Zinc, Total (BDL 10) µg/L	10.00	10.00	11.80	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 21 – Complete analytical sampling results for all parameters for Cooley Creek

ANALYTE	Cooley Creek																	
	7/20/23	8/16/23	8/17/23	8/24/23	9/20/23	10/18/23	11/13/23	12/6/23	1/25/24	2/19/24	3/18/24	4/15/24	5/14/24	5/28/24	6/3/24	6/10/24	6/12/24	6/17/24
<i>E. coli</i> MPN/100mL	150	240	49	120	4100	340	50	261	1730	111	113	138	921	210	225	118	178	228
<i>Enterococcus</i> MPN/100mL	160	690	250	89	2420	820	110	162	866	35	91	411	722	387	687	411	416	37
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 Cooley Creek

ANALYTE	Sugar Creek											
	7/18/23	8/22/23	9/25/23	10/17/23	11/6/23	12/7/23	1/24/24	2/14/24	3/19/24	4/17/24	5/15/24	6/12/24
BOD (5) Day (BDL 3) mg/L	3.0	3.0	3.0	6.8	3.0	3.0	3.0	3.0	6.9	6.7	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	505	604	417	383	512	443	406	481	499	607	535	606
Copper, Total (BDL 0.5) µg/L	1.18	1.33	2.17	1.05	0.98	0.95	2.44	1.15	0.94	1.08	1.44	1.05
Flow CFS	0.00	0.00	1.43	0.03	0.21	0.21	2.02	0.70	0.29	0.00	0.83	0.22
Hardness, Total (BDL 3.6) mg/L	180	180	170	180	230	270	220	280	240	220	240	210
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	1.24	0.56	0.57	0.50	0.50	0.50	0.85	0.50	0.50	0.81	0.50	0.98
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.53	0.20	0.20	0.20	1.40	1.00	0.20	0.20	0.69	0.20
Nitrogen, Total as N (BDL 0.5) mg/L	1.24	0.56	1.10	0.50	0.50	0.50	2.25	1.00	0.50	0.81	0.69	0.98
Oxygen Demand, Chemical (BDL 20) mg/L	25	20	20	20	20	20	25	20	20	20	20	20
Oxygen, Dissolved mg/L	5.49	3.80	7.61	11.30	12.40	11.47	12.78	14.38	12.45	10.75	7.90	9.20
pH (s.u.)	7.81	7.54	7.95	7.77	7.88	8.12	8.08	8.36	8.22	8.41	8.02	8.22
Phosphorus, Total (BDL 0.010) mg/L	0.044	0.026	0.054	0.012	0.022	0.023	0.118	0.039	0.017	0.027	0.023	0.026
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.028	0.016	0.026	0.011	0.015	0.017	0.087	0.016	0.012	0.018	0.014	0.017
Solids, Total Dissolved (BDL 10) mg/L	287	306	272	276	326	367	374	399	396	376	313	361
Solids, Total Suspended (BDL 2.0) mg/L	5.2	8.0	10.0	4.6	2.0	4.8	7.1	9.6	2.5	2.5	3.7	3.2
Temperature, Water °C	26.8	30.2	22.2	13.0	18.0	7.5	4.1	8.1	10.2	20.9	18.4	24.8
Turbidity (NTU)	6.26	2.91	12.70	1.37	1.31	2.92	12.20	8.83	1.82	1.39	2.60	2.23
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 23 – Complete analytical sampling results for all parameters for Sugar Creek

ANALYTE	Sugar Creek																	
	7/18/23	8/17/23	8/22/23	8/24/23	9/25/23	10/17/23	11/6/23	12/11/23	1/24/24	2/14/24	3/19/24	4/18/24	5/15/24	5/28/24	6/3/24	6/10/24	6/12/24	6/12/24
<i>E. coli</i> MPN/100mL	58	130	32	1700	260	67	79	24	866	1410	225	72	517	579	1730	1200	921	980
<i>Enterococcus</i> MPN/100mL	550	820	89	410	2400	440	110	63	4350	64	33	214	1730	1120	1990	1300	1200	816
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 Sugar Creek



ANALYTE	Tupelo Creek											
	7/20/23	8/16/23	9/20/23	10/19/23	11/15/23	12/14/23	1/29/24	2/19/24	3/20/24	4/16/24	5/22/24	6/17/24
BOD (5) Day (BDL 3) mg/L	3.0	3.0	6.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.7	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	452	477	222	463	543	443	578	524	543	576	185	602
Copper, Total (BDL 0.5) µg/L	1.43	1.68	3.42	1.09	1.08	0.96	1.42	0.88	1.10	1.23	4.03	1.22
Flow CFS	0.00	0.00	3.98	0.00	0.00	0.00	1.45	0.47	0.00	0.14	2.15	0.00
Hardness, Total (BDL 3.6) mg/L	170	170	110	23	270	270	340	330	250	230	85	200
Lead, Total (BDL 0.5) µg/L	0.50	0.50	0.89	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.75	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.64	0.86	0.78	0.50	0.57	0.50	0.50	0.50	0.53	0.54	1.29	0.64
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.20	0.20	0.58	0.20	0.20	0.20	2.50	1.10	0.20	0.20	0.46	0.20
Nitrogen, Total as N (BDL 0.5) mg/L	0.64	0.86	1.36	0.50	0.57	0.50	2.50	1.10	0.53	0.54	1.75	0.64
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	25	20	20	20	20	20	20	20	29	20
Oxygen, Dissolved mg/L	2.87	4.59	7.50	6.51	8.16	8.86	12.08	11.46	7.32	5.88	7.64	4.04
pH (s.u.)	7.79	7.84	7.89	7.62	7.49	7.89	8.14	8.11	8.01	8.05	7.91	8.06
Phosphorus, Total (BDL 0.010) mg/L	0.057	0.047	0.104	0.022	0.074	0.038	0.047	0.018	0.026	0.040	0.238	0.033
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.037	0.035	0.058	0.017	0.065	0.034	0.036	0.015	0.017	0.027	0.124	0.023
Solids, Total Dissolved (BDL 10) mg/L	251	280	157	312	412	392	488	489	388	346	152	322
Solids, Total Suspended (BDL 2.0) mg/L	8.8	8.0	13.0	3.6	8.0	8.8	3.2	4.6	4.7	2.5	43.0	2.5
Temperature, Water °C	27.3	23.1	21.2	14.3	11.2	5.5	6.2	5.5	12.0	20.2	19.7	26.4
Turbidity (NTU)	5.72	3.23	18.20	1.30	1.70	2.17	4.87	4.82	5.48	1.85	64.50	1.65
Zinc, Total (BDL 10) µg/L	10.00	10.00	16.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	22.30	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 Tupelo Creek

ANALYTE	Tupelo Creek																	
	7/20/23	8/16/23	8/17/23	8/24/23	9/20/23	10/19/23	11/15/23	12/14/23	1/29/24	2/19/24	3/20/24	4/16/24	5/22/24	5/28/24	6/3/24	6/10/24	6/12/24	6/17/24
<i>E. coli</i> MPN/100mL	53	340	650	310	25000	48	36	276	116	59	162	397	43500	326	179	53	73	74
<i>Enterococcus</i> MPN/100mL	200	1200	1700	2000	2420	56	43	260	345	23	99	1050	9678	1550	579	345	1730	22
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 Tupelo Creek

ANALYTE	Upper Mill Creek											
	7/24/23	8/22/23	9/20/23	10/19/23	11/15/23	12/14/23	1/25/24	2/15/24	3/20/24	4/16/24	5/20/24	6/20/24
BOD (5) Day (BDL 3) mg/L	3.0	3.0	4.4	3.0	3.0	3.0	3.0	3.2	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	751	841	161	804	727	586	569	631	709	879	312	845
Copper, Total (BDL 0.5) µg/L	1.10	1.65	3.64	0.87	0.95	0.58	3.13	0.99	0.86	1.01	3.20	1.22
Flow CFS	0.00	0.00	0.33	0.42	0.00	0.43	1.53	0.62	0.35	0.31	2.59	0.81
Hardness, Total (BDL 3.6) mg/L	320	300	87	430	210	400	310	390	390	410	130	310
Lead, Total (BDL 0.5) µg/L	0.50	0.50	2.04	0.50	0.50	0.50	3.04	0.50	1.04	0.50	1.03	0.50
Nitrogen, Kjeldahl, Total (BDL 0.50) mg/L	0.75	0.50	0.92	0.50	0.50	0.50	0.75	0.50	0.50	0.50	0.73	0.50
Nitrogen, Nitrate-Nitrite (BDL 0.2) mg/L	0.54	0.48	1.10	0.47	0.31	0.38	1.20	1.10	0.67	0.51	0.97	0.81
Nitrogen, Total as N (BDL 0.5) mg/L	1.29	0.50	2.02	0.50	0.50	0.50	1.95	1.10	0.67	0.51	1.70	0.81
Oxygen Demand, Chemical (BDL 20) mg/L	20	20	20	20	20	20	27	20	20	20	21	20
Oxygen, Dissolved mg/L	5.76	4.83	5.27	7.93	8.70	10.18	10.89	10.95	9.62	7.09	9.25	7.91
pH (s.u.)	8.24	8.14	8.06	7.95	7.94	8.15	8.11	8.15	8.07	8.13	8.13	8.07
Phosphorus, Total (BDL 0.010) mg/L	0.035	0.034	0.130	0.025	0.031	0.024	0.074	0.030	0.021	0.024	0.087	0.023
Phosphorus, Total Dissolved (BDL 0.010) mg/L	0.019	0.018	0.054	0.016	0.019	0.012	0.031	0.017	0.013	0.014	0.047	0.014
Solids, Total Dissolved (BDL 10) mg/L	524	477	108	643	593	554	483	547	565	625	167	509
Solids, Total Suspended (BDL 2.0) mg/L	4.5	11.0	29.0	3.6	12.0	6.2	27.0	2.9	4.6	3.3	6.5	3.7
Temperature, Water °C	25.4	29.6	21.8	15.8	12.5	7.8	7.6	9.3	12.6	21.4	22.2	26.7
Turbidity (NTU)	6.50	5.87	51.40	4.80	7.12	2.83	51.50	3.89	6.76	3.40	14.70	4.01
Zinc, Total (BDL 10) µg/L	10.00	10.00	18.70	10.00	10.00	10.00	31.90	10.00	10.00	10.00	10.20	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 Upper Mill Creek

ANALYTE	Upper Mill Creek																	
	7/24/23	8/17/23	8/22/23	8/24/23	9/20/23	10/19/23	11/15/23	12/14/23	1/25/24	2/15/24	3/20/24	4/16/24	5/20/24	5/28/24	6/3/24	6/10/24	6/12/24	6/20/24
<i>E. coli</i> MPN/100mL	690	2000	690	550	19000	550	580	121	866	129	225	1730	10900	1990	1550	866	517	411
<i>Enterococcus</i> MPN/100mL	1200	1100	690	1300	2420	1400	220	162	2420	46	184	1410	9680	2420	1120	1050	275	184

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 Upper Mill Creek

#### 4.0 REFERENCES

- CCRC & FTN. (2023). *City of Tulsa Watershed Characterization Program Analytical Monitoring Component QAPP*. Tulsa, OK: City of Tulsa Streets and Stormwater, Stormwater and Land Management Section.
- CCRC & FTN. (2023). *City of Tulsa Watershed Characterization Program Biological Component QAPP*. Tulsa, OK: City of Tulsa Streets and Stormwater, Stormwater and Land Management Section.
- ODEQ. (2024, February 1). OPDES Permit OKS000201. *Authorization to Discharge*. Tulsa, OK, U.S.: Oklahoma Department of Environmental Quality.
- ODEQ. (2012). *Continuing Planning Process*. Oklahoma City, OK: Oklahoma Department of Environmental Quality.
- ODEQ. (2022). *Water Quality in Oklahoma Integrated Report*. Oklahoma City, OK: Department of Environmental Quality.
- ODEQ. (2023a). *Chapter 730 Oklahoma Water Quality Standards*. Oklahoma City, OK: Oklahoma Administrative Code Title 252.
- ODEQ. (2023b). *Chapter 740 Implementation of Oklahoma's Water Quality Standards*. Oklahoma City, OK: Oklahoma Administrative Code Title 252.
- OWRB. (2001). *Unified Protocols for Beneficial Use Assignment for Oklahoma Wadable Streams*. Oklahoma City, OK: Oklahoma Water Resources Board.

## Follow up and response program

This program is responsible for identifying sources of pollution that end up in stormwater runoff or flow directly into creeks. These discharges are identified through monthly sampling performed for the watershed characterization program. All monthly parameters are checked against water quality standards and all exceedances are investigated. Investigations can include checking the stream, sanitary sewer line breaks, drinking water line breaks, taking samples in for laboratory analysis and doing dry weather field screening checks.

Month	Follow up assigned	Parameter	Method	Result	Source Found	Evaluation	SSO Occurrence
July	Upper Mill Creek	TDS	TDS pen	No evidence of active source, SSO map reviewed	Yes	City of Tulsa dredging channel upstream	
August	Coal Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed	No	Source not found. Bacteria samples taken did not narrow down possible source.	
	Cooley Creek	E. coli, Enterococcus	Ammonia chlorine	No evidence of active source, SSO map reviewed	No	Source not found.	
	Upper Mill Creek	E. coli, Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed	No	Source not found.	
September	Adams Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed. High chlorine comes from lawn care.	No	Source not found.	
	Cooley Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Tupelo Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO	No	Source not found. Illicit discharge of pool water	

				map reviewed.		found and reported.	
	Upper Mill Creek	E. coli, Enterococcus, Turbidity	Ammonia, chlorine, turbidity check	No evidence of active source, SSO map reviewed.	No	Source not found. Turbidity has gone back down. High turbidity was from rain event.	
October	Adams Creek	Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed. High chlorine comes from lawn care.	No	Source not found.	
	Center Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Cooley Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
November	Adams Creek	Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed. High chlorine comes from lawn care.	No	Source not found.	
	Center Creek	Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Coal Creek	E. coli, Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Source not found. Found dump site. Found camp with unhoused people.	
	Cooley Creek	Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Tupelo Creek	TDS	TDS pen	No evidence of active source, SSO	No	Source not found.	

				map reviewed.			
	Upper Mill Creek	E. coli, Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Source not found. Wet weather sampling done, and several problem areas identified.	
December	Adams Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed. High chlorine comes from lawn care.	No	Source not found.	
	Brookhollow Creek	Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Center Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Coal Creek	E. coli, Enterococcus	Ammonia, chlorine	Found sanitary sewer leak but doesn't impact sample site	No	Source not found.	5268 E Pine St
	Cooley Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Sugar Creek	Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Tupelo Creek	E. coli, Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Source not found. Problem is likely in an area heavily inhabited by the unhoused.	
	Upper Mill Creek	Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Found drinking water leak entering the system.	

January	Brookhollow Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	11706 E 32 <sup>nd</sup> PI
	Coal Creek	E. coli, Enterococcus, Turbidity	Ammonia, chlorine, turbidity check	No evidence of active source, SSO map reviewed.	No	Turbidity has gone back down. Property owner has dumped horse feces into stream.	1616 N Pittsburg Ave
	Cooley Creek	E. coli, Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	High TDS most likely coming from roadway project	
	Sugar Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Tupelo Creek	Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Source not found. Tracked to the end of the flow.	12550 E 18 St S
	Upper Mill Creek	E. coli, Enterococcus, TDS, Turbidity	Wet weather field screening	Dead fish found with large amounts of sediment in the stream.	Yes	Water line break caused fish kill	
February	Coal Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source. There was an overflow early in the month.	No	Source not found. Dump site found and reported.	1041 N. SANDUSKY AVE.
	Upper Mill Creek	E. coli, Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Source not found.	
March	Center Creek	Enterococcus, TDS	Ammonia, chlorine, TDS pen	No evidence of active source, SSO map reviewed.	No	Source not found. High chlorine caused by water flushing.	
	Sugar Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
April	Adams Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO	No	Source not found.	

				map reviewed.			
	Brookho llow Creek	E. coli, Enterococcus	Ammonia , chlorine	No evidence of active source, SSO map reviewed.	No	Source not found.	
	Center Creek	E. coli, Enterococcus , TDS	Ammonia , chlorine, TDS pen	No evidence of active source, SSO map reviewed	No	Source not found.	
	Coal Creek	E. coli, Enterococcus	Ammonia , chlorine	No evidence of active source, SSO map reviewed	No	Source not found.	6420 N. LAKEWOO D AVE.
	Cooley Creek	E. coli, Enterococcus	Ammonia , chlorine	No evidence of active source, SSO map reviewed	No	Source not found.	
	Sugar Creek	Enterococcus	Ammonia , chlorine	No evidence of active source, SSO map reviewed	No	Source not found.	
	Upper Mill Creek	TDS	TDS pen	No evidence of active source, SSO map reviewed. Problematic sewer lines in neighborhoo d are being rehabilitated	No	Possible TDS from old mining activity	
May	Tupelo Creek	D.O., Turbidity	D.O. check, check turbidity	No evidence of active source, SSO map reviewed	Yes	High turbidity was caused by rain event and low D.O. likely caused by sanitary sewer overflow.	
June	Adams Creek	E. coli, Enterococcus , TDS	Ammonia , chlorine, TDS pen	No evidence of active source, SSO map reviewed. High chlorine comes from lawn care. Very low flow	Yes	Caused by low water flow through the neighborhoo d and lawn watering.	



	Brookhollow Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed	No	No evidence of active source, SSO map reviewed	
	Cooley Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed	No	No evidence of active source, SSO map reviewed	
	Sugar Creek	E. coli, Enterococcus	Ammonia, chlorine	No evidence of active source, SSO map reviewed	No	No evidence of active source, SSO map reviewed	

**Section 5**

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

	FY 23/24 Actuals	FY 24/25 Budget
Fin Dir Internal IT	5,053	10,572
Warehouse	10,491	10,860
Utilities Administration	708,231	802,165
Chief Data Office - Project Management	-	94,859
Fin OCDO Admin	-	10,598
Fin OCDO Operations	-	46,783
Fin OCDO Innovation	-	11,880
Fin OCDO Governance & Analytic	-	25,598
Customer Care	381,033	427,308
Security (Direct Charge Fund 560)	63,000	63,000
Asset Management Admin	857	4,006
Security	309,216	351,274
Building Operations – Contracts	2,916	8,660
Building Maintenance	20,091	26,807
Custodial Services	16,785	14,251
IT Administration	58,461	70,638
IT Cio Admin	15,569	16,369
IT Cio Internal IT	4,953	14,015
IT Mgt Admin		

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Section 5 – Annual Expenditures

	37,939	40,254
IT Operations	235,459	272,152
IT Ops Support Admin	11,591	13,803
IT Ops Radio Services	49,586	50,464
IT Ops Network	80,419	101,283
IT Ops Database Svs	51,091	59,920
IT Ops Server Svs	42,772	46,682
IT Client Services	390,684	391,946
IT Client Deploy Svs	51,513	58,356
IT Client Services Operations	18,395	18,767
IT Client Financial	4,673	-
IT Client Project	32,898	5,415
IT Client Sys Maint	82,982	111,638
IT Client Architecture Svs	29,546	30,401
IT Development Svs	90,771	76,750
IT Client Support Svs	79,905	90,618
IT Capital Direct Charges	-	36,000
IT Cloud Services	133,029	157,142
IT Ent Cld Sup Svs	95,080	106,284
IT Utl Sys Etl Sup	111	107
IT Utl Bill Sys Sup	37,838	50,752
Engineering Services Administration	12,531	-
Engineering Administration – Stormwater	239,648	-
Alert System		-

Annual Report FY 2023-2024

Section 5 – Annual Expenditures

	43,858	
Field Engineering – Administration	99	-
Graphics / CADs	404	-
Floodplain Management	1,252,607	-
Right Of Way	250	-
Public Works - Administration	265,124	288,302
S&SW Dir Admin	265,124	250,817
S&SW Dir Admin	-	21,896
PW Admin D Director	-	15,589
Pubworksengadmin Stormwater	-	-
SS Payroll & Accts Payable	105,369	104,585
S&SW Dir Stormwater Fund	6,046,481	6,832,023
SS - Legal Representation	48,977	48,977
S&SW Dir Internal IT	98,939	153,838
Stormwater & Land Management Admin	2,330,121	1,732,490
S&SW Stm Mgt Admin	1,562,310	1,638,399
S&SW Stm Mgt Admin	767,811	94,091
Detention, Ditch, Concrete Channel	1,271,970	2,038,311
Channel Maintenance And Ditching	2,265,915	2,733,276
Storm Sewer Maintenance	1,418,040	4,179,374
Stormwater Quality	1,881,503	2,968,744
Stormwater Vegetation	3,337,827	4,058,063
Land Reclamation Site	80,205	86,027
Household Pollutant Collection	55,458	219,615

Annual Report FY 2023-2024

Section 5 – Annual Expenditures

S&SW Household Pollut Collection	55,458	82,500
S&SW Household Pollut Collection	-	137,115
Street Maint & Inspections - Admin	203,319	226,421
Street Maintenance -- Patching	943,654	1,043,264
S&SW Str Mt Patching	943,654	1,043,264
Paving Cut Administration	55,468	41,116
S&SW Mowing And SWeeping	2,244,409	3,208,938
S&SW Invest/inspection	824,932	1,216,639
S&SW Stormsewer Cleaning	1,039,941	1,031,007
S&SW Stormsewer Repairs	1,973,614	2,556,450
PW Ad Central Svs	71,229	67,555
PW Design Admin	88,002	43,591
PW Design Services	82,551	109,630
PW Field Administration	57,153	142,317
PW Field Const Inspect	612,649	629,254
PW Field Surveys	185,847	218,711
PW Planning Admin	165,034	109,721
PW Planning Proj Mgt	84,749	46,345
PW Planning Infrastructure	62,146	193,469
PW Planning Row Acquisition	248,798	186,753
Water And Sewer Admin.	23,405	25,646
Water & Sewer Dept. – Stormwater	218,132	3,474,750
W&S Admin Internal IT	5,434	23,240

Annual Report FY 2023-2024

Section 5 – Annual Expenditures

Quality Assurance – Administration	11,359	15,405
Quality Assurance – Operations Support	1,199	2,280
Laboratories	158,771	211,092
Distribution Systems - Administration	18,991	22,641
Field Cust. Serv. Rep. I (meter Reading)	127,332	144,898
Field Cust. Serv. Rep. II (meter Turn On/off)	-	125,776
Sewer O & M – Admin	110,325	111,199
Lift And Pump Stations	308,696	388,298
Sewer O & M – Support Services / Dispatch	11,083	-
W&S Preventive Maint	5,034	-
W&S Sewer I&I Abatement	6,049	-
Utility Planning & Design Admin	81,844	89,886
Utility Design	827,601	927,624
Utility Asset Planning	328,079	308,678
GIS Services	591,235	448,737
Utility GIS	591,235	407,904
GIS Services	-	40,833
General Site Services Changed To P&R Fac Sys Land & Gen Maint	440,295	480,397
Horticulture Changed To P&R Uti Svs Horticulture	106,521	119,672
Park - Fac Svs Forestry - New Split From Horticulture	96,055	82,057
Debt Service	2,654,745	4,385,000
Transfer To Capital Projects	7,189,000	6,670,000
Totals	45,344,234	57,313,719

## 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 256 investigations were conducted identifying 44 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 Maintenance and Operations (SMO) 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)
224	Stormwater (relating to potential releases of pollutants to the storm sewer or violations of the pollution ordinance)
1	Drug Labs (relating to the potential release of pollutants from drug lab remediation to the storm sewer or violations of the pollution ordinance)
256	Total number of investigations for this reporting year

Section 6 – A Summary of Enforcement Actions, Inspections and Public Education

- Construction Site – Erosion Control
  - The SMO Division conducted 1,297 construction site inspections resulting in 17 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 \$950.
- 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, 465 industrial stormwater inspections were conducted. Fourteen enforcement actions were taken against industries or facilities in order to eliminate illegal or illicit discharges. \$100 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 SMO conducted the following:

- Sanitary sewer lines TV inspected – 198.6 miles

SMO conducted the following inspections:

- Storm sewer lines inspected – 8.9 miles
- Industrial and commercial storm water runoff inspections – 465
- Construction site erosion control inspections – 1,297

Development Services conducted the following number of inspections:

- 2,875 construction site inspections were conducted with attention on erosion controls measures.



Section 6 – A Summary of Enforcement Actions, Inspections and Public Education

Engineering Services conducted the following inspections:

- Daily inspections at construction projects (97 city and 54 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 2023-2024” lists the educational material distributed during this reporting period by the City of Tulsa.

Attachment B “Education Events 2023-2024” lists the educational activities performed during this period by the City of Tulsa.

Attachment C “Children’s Education Activities 2023-2024” lists various educational activities performed for children’s groups.



**Attachment B: Events in FY 24**

<b>Date</b>	<b>Event Name</b>	<b>Decription</b>	<b># attended</b>
7.1.2023	City Life	Utility Bill Stuffer	140600
7.10.2023	Pre-Development Meeting	This meeting was for the construction of a coffee shop drive thru. The owner stated they would not be using any LID techniques for this project.	18
7.11.2023	Fish Collection Demonstration	Fish and Macroinvertabrate collection demonstration at McClure park to summer camp students.	34
7.12.2023	Pre-Construction Meeting	Pre Construction IDP Project meeting where they discussed ECM's and drag out.	10
7.13.2023	Pre-Construction Meeting	Pre Construction IDP Project meeting where they discussed ECM's and drag out.	10
7.13.2023	ECM Training Email	Forwarded infor to Field Engineering and Development Services inspectors about attending training either by OU Water Survey or EPA on construction site inspections and ECM's	7
7.15.2023	Rain Barrel DIY	Gave some rain barrel informaiton out and a rain barrel from upcycle.	1
7.17.2023	Rain Barrel DIY	Gave some rain barrel informaiton out and a rain barrel from upcycle.	1
7.17.2023	CAP - Briarglen	Went to the CAP program for the early start of STEM for young children	85
7.18.2023	CAP - Disney	Went to the CAP program for the early start of STEM for young children	81
7.20.2023	CAP - Sand Springs	Went to the CAP program for the early start of STEM for young children	38
7.25.2023	Master Gardeners visit	Visited with Brian Jervis with the Master Gardeners and gave him more of our literature.	1

Date	Event Name	Description	# attended
7.26.2023	CAP - Skelly	Went to the CAP program for the early start of STEM for young children	48
7.26.2023	Drillers	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3660
7.31.2023	Pre-Development Meeting	This meeting was for the construction of an apartment complex. The owners stated that they would not be using any LID techniques.	20
7.31.2023	Pre-Development Meeting	This meeting was for the construction of an industrial building. The owners stated that they would not be using any LID techniques for this project.	15
8.1.2023	Stormwater Newsletter	Stormwater Newsletter sent out to residents of Tulsa	1,983
8.1.2023	Fish Collection Demonstration	Fish and Macroinvertebrate collection demonstration at McClure park to summer camp students.	34
8.3.2023	Meadow Mosey	Crow Creek event at 33rd PI where we talked to citizens about the meadow and water quality	10
8.9.2023	Drillers	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3,727
8.15.2023	LID Manual	Discussed the status of the stalled LID Manuals, the draft permit requirements to incentivize LID, and the draft permit language about a maintenance plan for private LID.	14
8.15.2023	SDHMAB LID	Discussed the status of the stalled LID manuals, the draft permit requirements to incentivize LID, and other permit language.	21
8.19.2023	Dead Plant Society	Went to this club meeting to discuss the HPCF and the Swap Shop.	11

Date	Event Name	Description	# attended
8.21.2023	Pre-Development Meeting	This meeting was for the construction of an RV Park with cabins. The owners stated that they would not be using any LID techniques for this project.	19
8.30.2023	Drillers	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3867
9/1/23	City Life	Utility Bill Stuffer	140600
9.7.2023	MS4 Permit Meeting		
9.9.2023	Welcoming Week Festival	The City of Tulsa held a welcoming week to welcome new Tulsans. They gave out some SWQ supplies.	500
9.13.2023	Drillers	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3375
9.23.2023	Monarchs on the Mountain	Yearly Event that showcases Monarch Butterflies.	3,500
9.28.2023-10.8.2023	State Fair	State fair at the fair grounds. We gave out stormwater promo items and discussed the impact of pollution in the environment.	1075000
10.4.2023	OSU - Tulsa Class	Had a virtual lecture at OSU Tulsa teaching the students about Stormwaters MS4 permit.	9
10.9.2023	Pre-Development Meeting	This meeting was for the construction of a commercial property (Tulsa Rain Control). The owners stated they would not be using any LID techniques for this site.	10
10.9.2023	Pre-Development Meeting	This meeting was for the construction of Phillips Seminary a homeless shelter. The owners stated that they would not be using an LID techniques for this site.	18
10.12.2023	B2B Event	Sustainable alliance meeting at Philbrook Museum	55

Date	Event Name	Description	# attended
10.21.2023	Trunk for Treat	Trunk for Treat Event held by the Parks Department. Gave out information about our HPCF, candy, and SOS toys for kids	3500
10.25.2023-10.26.2023	SWOCC	Stormwater Operators Certification Course for Streets and Stormwater employees.	35
10.25.2023	PSO Rebates and Geothermal Considerations	Briefly described stormwater quality.	30
10.28.2023	Fishing Derby	Close to home fishing program at Braden Park	13
10.28.2023	Trash 4 Treat	Cleanup event at Zink park	5
10.30.2023	Pre-Construction Meeting	Pre Construction meeting on a Street Project.	10
11.1.2023	City Life	Utility Bill Stuffer	140600
11.1.2023	Build My Future	Trade Learning event for high school students	825
11.2.2023	TPS Central	Went to Central middle school to discuss the impact of pollution on the environment.	53
11.3.2023	TPS East Central	Went to East Central middle school to discuss the impact of pollution on the environment.	52
11.6.2023	Pre-Development Meeting	This meeting was for the construction of a safeway warehouse. The owners stated that they would not be using any LID techniques for this site.	16
11.6.2023	Pre-Development Meeting	This meeting was for the construction of a residential development. The owners stated that they would not be using any LID techniques for this project.	18
11.9.2023	TPS Edison	Went to Edison middle school to discuss the impact of pollution on the environment	199
11.13.2023	Pre-Development Meeting	This meeting was for the construction of Spectrum Paints Headquarters. The owners stated that they would not be using any LID techniques for this project.	18

Date	Event Name	Description	# attended
11.13.2023	Pre-Development Meeting	This meeting was for the construction of a warehouse (Greenhill SW). The owners stated that they would not be using any LID techniques for this project.	19
11.16.2023	Pre-Construction Meeting	TMUA-W 19-09 A.B Jewell Construction at Plant.	14
11.16.2023	TPS Hale	Went to Hale middle school to discuss the impact of pollution on the environment	173
11.27.2023	Pre-Development Meeting	This meeting was for the construction of Greenheck Factory. The owners stated that they would not be using LID techniques for this project.	17
11.27.2023	Pre-Development Meeting	This meeting was for the construction of a Priority Bank. The owners stated that they would not use LID techniques.	17
11.30.2023	TPS Monroe	Went to Monroe middle school to discuss the impact of pollution on the environment	105
12.4.2023	Pre-Development Meeting	This meeting was for the construction of Bouse Fluff House (Dog Boarding Center). The owners stated that they would not be using any LID techniques for this project.	22
12.7.2023	TPS Will Rogers	Went to Will Rogers middle school to discuss the impact of pollution on the environment	100
12.9.2023	Boy scouts Creek Cleanup	Boy scouts went to Vensel creek to clean up.	15
12.11.2023	Pre-Development Meeting	This meeting was for the construction of a restaurant. The owners stated that they would not use any LID techniques for this project.	17
12.11.2023	Pre-Development Meeting	This meeting was for the construction of Case Mingo (Apt. Complex). The owners stated that they would not be using any LID techniques for this project.	15

<b>Date</b>	<b>Event Name</b>	<b>Description</b>	<b># attended</b>
12.13.2023	Customer Care Tour of HPCF	Gave a tour of the HPCF to employees in the Customer Care Department	6
12.14.2023	TPS Webster Middle School	Went to Webster middle school to discuss the impact of pollution on the environment	61
1.1.2024	City Life	Utility Bill Stuffer	140600
1.8.2024	Pre-Development Meeting	This meeting was for the construction of a residential development called 71 Flats. The owners stated that they would not be using any LID techniques.	16
2.1.2024	City Life	Utility Bill Stuffer	140600
2.1.2024	TPS Carver	Went to Carver middle school to discuss the impact of pollution on the environment	76
2.2.2024	TPS Central	Went to Central middle school to discuss the impact of pollution on the environment.	16
2.7.2024	Customer Care Tour of HPCF	Gave a tour of the HPCF to employees in the Customer Care Department	11
2.8.2024	TPS-East Central	Went to East Central middle school to discuss the impact of pollution on the environment.	103
2.9.2024	TPS-Edison	Went to Edison middle school to discuss the impact of pollution on the environment	229
2.10.2024	Butterflies, Birds, Bees, Oh My!	Workshop discussing how to set up a pollinator garden	80
2.12.2024	Pre-Development Meeting	This meeting was for the construction of a senior living development. The owners stated that they were not going to use any LID techniques on this project.	17
2.14.2024	Construction Meeting	Construction meeting for the Jones Douglas 91-N Relief Line	15
2.16.2024	TPS-Hale	Went to Hale middle school to discuss the impact of pollution on the environment	283



Date	Event Name	Description	# attended
2.19.2024	Pre-Development Meeting	This meeting was for the construction of a Hotel and Restaurant (Jain's Estates). The owners states that they would not be using LID techniques.	16
2.19.2024	Pre-Development Meeting	This meeting was for the construction of an Asphalt Plant. The owners stated that they would not be using any LID techniques.	17
2.22.2024	TPS-Memorial	Went to Memorial middle school to discuss the impact of pollution on the environment	47
2.22.2024	OKR10 Internal Training	Internal training on erosion control measures for the City's Mulch and Land Reclamation site.	10
2.23.2024	TPS-Monroe	Went to Monroe middle school to discuss the impact of pollution on the environment	120
2.24.2024	Butterflies, Birds, Bees, Oh My!	Workshop discussing how to set up a pollinator garden	90
2.26.24	Pre-Development Meeting	Bill Knight Auto Shop	15
2.26.24	Pre-Development Meeting	Midtown Industrial Park	13
2.27.2024	TARE -Refuse Monthly Report	Gave update on HHP monthly report for Jan. Spoke about uptick in Swap Shop customers.	22
2.27.2024	Zink Lake Public Meeting	Public meeting to discuss Zink Lake ammenities and water quality monitoring	92
2.29.2024	TPS-Met	Went to Met middle school to discuss the impact of pollution on the environment.	61
3.1.2024	City Life	Utility Bill Stuffer	140600
3.1.2024	TPS-Will Rogers	Went to Will Rogers middle school to discuss the impact of pollution on the environment	43
3.7.2024 - 3.10	Home and Garden Show	We had a 10x40 SWQ booth with education, fish tanks, promo items, and commercials	19719
3.11.24	Pre-Development Meeting	This meeting was for the construction of a Cascia Hall Wellness Center. The owners stated that they would not be	18

Date	Event Name	Description	# attended
3.20.2024 - 3.22.2024	SWOCC	Stormwater Operators Certification Course for Streets and Stormwater employees.	19
3.25.24	Pre-Development Meeting	This meeting was for the construction of an OSU Medical Expansion Facility. The owners stated that they would not	18
3.27.2024	Career Expo	Career Fair held for citizens of Tulsa for open jobs within the city.	389
4.1.2024	MS4 Stormwater Discharge Permit Summary	Stormwater Quality presentation over new permit	25
4.1.24	Pre-Development Meeting	This meeting was for the construction of the Airport Industrial Center. The owners stated that they would not be	14
4.4.2024	1st Thursday	Sustainability alliance meeting at TCC	40
4.10.2024-4.11.2024	Oklahoma Clean Lakes and Watershed Association	Conference in Stillwater where Stormwater gave a presentation over the Great Tulsa Cleanup (No giveaways)	38
4.12.2024	SpringFest	Spring Fest Event with Crow Creek Community	129
4.1.2024 - 4.30.2024	Great Tulsa Cleanup	Annual cleanup up event for the whole month of April (remaining t-shirts need to be counted)	789
4.20.2024	Earth Day Celebration	Earth Day Celebration at Chandler Park	50
4.27.2024	Fishing Derby	Annual fishing derby held by the parks department	41
4.29.24	Pre-Development Meeting	This meeting was for the construction of a Retail store. The owners stated that they would not be using any	12
4.29.24	Pre-Development Meeting	This meeting was for the construction of a ASCO Equipment Store. The owners stated that they would most likely	22
5.3.2024 - 5.4.2024	Rain Barrel Sale	Stormwaters Annual Rain Barrel Sale (Ask Jacob for information regarding giveaways)	120
5.4.2024	Plant Sale at Woodward Park	Plant sale at Woodward Park with Tulsa Watershed Alliance	77

Date	Event Name	Description	# attended
5.20.24	Pre-Development Meeting	This meeting was for the construction of Jain's Riverfront Apts. The owners stated that they would not be using	13
5.20.24	Pre-Development Meeting	This meeting was for the construction of Key Plus Residential Development. The owners stated that they would not	16
6.10.24	Pre-Development Meeting	This meeting was for the construction of the Eastland Apts. They owners stated that they would not be using	24
6.17.24	Pre-Development Meeting	This meeting was for the construction of a Quick Quack Car Wash. The owners stated that they may use underground	14
6.17.24	Pre-Development Meeting	This meeting was for the construction of a Quick Quack Car Wash. The owners stated that they may try to use	11
6.26.2024	Drillers	Formerly "Bark in the Park". Dog owners brought pets to baseball game. We spoke with fans about stormwater quality	3673

**Attachment C: Tulsa Kids Education FY 23/24**

Date	Event Name	Description	# Attended
7.17.2023	CAP - Briarglen	Went to the CAP program for the early start of STEM for young children	85
7.18.2023	CAP - Disney	Went to the CAP program for the early start of STEM for young children	81
7.20.2023	CAP - Sand Springs	Went to the CAP program for the early start of STEM for young children	38
7.26.2023	CAP - Skelly	Went to the CAP program for the early start of STEM for young children	48
8.1.2023	Fish Collection Demonstration	Fish and Macroinvertebrate collection demonstration at McClure park to summer camp students.	34
11.2.2023	TPS Central	Went to Central middle school to discuss the impact of pollution on the environment.	53
11.3.2023	TPS East Central	Went to East Central middle school to discuss the impact of pollution on the environment.	52
11.9.2023	TPS Edison	Went to Edison middle school to discuss the impact of pollution on the environment	199
11.16.2023	TPS Hale	Went to Hale middle school to discuss the impact of pollution on the environment	173
11.30.2023	TPS Monroe	Went to Monroe middle school to discuss the impact of pollution on the environment	105
12.7.2023	TPS Will Rogers	Went to Will Rogers middle school to discuss the impact of pollution on the environment	100
12.14.2023	TPS Webster Middle School	Went to Webster middle school to discuss the impact of pollution on the environment	61
2.1.2024	TPS Carver	Went to Carver middle school to discuss the impact of pollution on the environment	76
2.2.2024	TPS Central	Went to Central middle school to discuss the impact of pollution on the environment.	16
2.8.2024	TPS-East Central	Went to East Central middle school to discuss the impact of pollution on the environment.	103
2.9.2024	TPS-Edison	Went to Edison middle school to discuss the impact of pollution on the environment	229
2.16.2024	TPS-Hale	Went to Hale middle school to discuss the impact of pollution on the environment	283

2.22.2024	TPS-Memorial	Went to Memorial middle school to discuss the impact of pollution on the environment	47
2.23.2024	TPS-Monroe	Went to Monroe middle school to discuss the impact of pollution on the environment	120
2.29.2024	TPS-Met	Went to Met middle school to discuss the impact of pollution on the environment.	61
3.1.2024	TPS-Will Rogers	Went to Will Rogers middle school to discuss the impact of pollution on the environment	43
<b>Total:</b>			2007

## **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 identified some factors that appear to be negatively influencing the health of Tulsa's streams. We are continuing to build upon databases of site-specific conditions which will allow us to better determine improvements or degradation in water quality. Additional personnel recently added have begun to draft new program components for TMDL's 303d impairments, and GIS mapping all of which will play a role in improving the health of Tulsa's waters.

## **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. The new permit milestone as it pertains to Watershed Characterization will be met by the time specified.

## **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.





August 16, 2024

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 2024 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, 2023 through June 30, 2024.

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,

Brian Taylor, P.E.  
Chief Engineer

Enclosure



**OKLAHOMA**  
Transportation

200 N.E. 21<sup>st</sup> Street  
Oklahoma City, OK 73105-3204  
[www.odot.org](http://www.odot.org)

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Annual Report

For

July 1, 2023 through June 30, 2024

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*"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."*

AN EQUAL OPPORTUNITY EMPLOYER



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.

A handwritten signature in blue ink that reads "B. Taylor".

Brian Taylor, P.E.  
Chief Engineer

08/16/2024

Date

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

August 16, 2024

Status

The Oklahoma Department of Transportation (ODOT) has implemented and is in compliance with the Storm Water Management Plan. The following items demonstrate activities undertaken for this annual report 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. During this fiscal year, litter was picked up 11 times over a 4,659 acre area for a total of 17,853 bags of trash. This was done for a total amount of \$375,615.82. In addition, 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, covering 4,359 acres, were mowed in 7 cycles at the expense of \$924,275.24.

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 270 stormwater inspections in District 8 alone. In addition, District 8 has a contract for approximately 16 sites to have weekly stormwater inspections and monthly environmental compliance inspections.

In this last year, the agency has hired six additional, and a total of eight new employees to into the Clean Water section. This includes six Field Liaisons who work within each field district, and two Clean Water Specialists, stationed out of Oklahoma City. The field liaison team is fully staffed with seven liaisons and so far, the agency has seen great success with the program.

Non-Traditional MS4 Program

*"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."*



The agency continues develop a stormwater program that will adhere to the Minimum Control Measures once the permit is obtained. With the addition of 8 new personnel in the last year, this has allowed the program to further develop field inspection and assistance, good house keeping and pollution prevention training, and further enhance the ability to expand tools and methods for use in compliance.

#### 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 June of 2024, ODOT Environmental Programs conducted a training for the District 8 Headquarters Maintenance personnel, located in Tulsa. Since last year, operations have been updated to reflect the audit conducted by ODEQ the previous year. There were also slight updates made to the GHPPP in this location.

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

In October of 2023, ODOT in partnership with the Oklahoma Turnpike Authority (OTA), Association of Oklahoma General Contractors, and the Department of Environmental Quality (ODEQ) held the Second Annual Contractor Construction Compliance Conference (C4). This event was a success and brought various stakeholders to one room to discuss environmental compliance during construction.

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. Internally, the ODOT Clean Water Program has developed an OKR10 training and used that for training for the field liaisons. This training will be used moving forward in districts for local staff.

Every year, school-age children participate in our annual poster contest. This year's contest was 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 2024 Trash Poster Calendars were printed and distributed in December throughout Oklahoma and the United States.

There were 5,130 poster entries from 218 K-12 Oklahoma Schools. This was a representation of 64 counties across the state.

#### Adopt-a-Highway/ TRASH-OFF

ODOT'S anti-litter efforts are on-going and include 150 separate "Adopt-a-Highway" groups statewide who remove litter from their two-mile section of state highways at an interval of four times a year, for a two-year commitment. Tulsa has approximately 63 "Adopt-a-Highway" groups covering 126 miles.

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 an 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.

*"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."*



In FY 24, there were 97 employees statewide who took a course for the initial Pesticide Applicator Certification School. Participation for this was broken into two classes, a Core class and a Right-of-Way (ROW) specific course. These were held in four locations across the state (Perry, Weatherford, McAlester, and Tulsa). 97 employees completed the Core class, and 86 employees completed the ROW course.

There were three Continuing Education Unit (CEU) Workshops held in seven of the eight ODOT field districts. The statewide total participants for these were 193. This number is lower than previous years, due to the increase of CEUs that were offered in FY 23. ODOT employees are always encouraged at the trainings to check and maintain the number of CEUs needed to maintain their certifications.

### Wildflowers

In 2023, ODOT managed 10,147 acres of their land system ROW corridors through conservation mowing, set asides, and brush management for the benefit of the monarch butterfly. In order to promote monarch habitat resources and conservation practices across all eight field districts, ODOT distributed updated ROW landscape prioritization maps of roadside habitat. Educational displays are in place and were maintained at the ODOT State Capitol Complex building and the Oklahoma State Travel and Tourism Centers. ODOT Presented information on the Monarch CCAA Program implementation to 2023 National Rights-of-way Vegetative Managers Association Annual Conference in Knoxville, Tennessee. ODOT participated in the steering committee of the Oklahoma Monarch and Pollinator Collaborative, and multi-agency group providing resources to state residents and agencies as part of the statewide Monarch Conservation Plan. In addition, educational materials were developed and distributed at events state-wide, such as the Norman Pollinator Week, Monarch Festival, and Earth Day Celebrations. ODOT participates on the National Science Foundation Transportation Research Board AKR20 Subcommittee on Pollinators.

The Department was recognized for its efforts at the Keep Oklahoma Beautiful (KOB) Environmental Excellence Awards Gala, and received the 2023 State Government Program Environmental Excellence Award. ODOT also received other awards this year including: the National Rights-of-Way as Habitat Working Group, Monarch CCAA Outside of the Box, Most Asclepias Milkweed in Rights-of-Way South and Western Region, and Wind Beneath our Wings Awards.

### Collection and Recycling

ODOT has oil removed at a flat rate of \$3,600 per fiscal year. Approximately 59 cubic yards of tire debris was collected during the year.



**OKLAHOMA**  
Turnpike Authority

August 23, 2024

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, 2023, through June 30, 2024.

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, 2023 through June 30, 2024  
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 10 miles of Creek Turnpike roadway are within Tulsa's MS4 boundary. The Creek Turnpike areas include 5.8 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. Approximately 5 miles of the Gilcrease Turnpike are within Tulsa's MS4 boundary. The Gilcrease Turnpike areas include 0.8 miles in the Mooser Creek-Arkansas River watershed and 4.2 miles in the Harlo Creek- Arkansas River watershed.

### 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 of all below ground storm water carrying structures. All stormwater structures on the Creek Turnpike within the Tulsa MS4 area were inspected in 2023 and will be inspected again in 2025. The initial inspections for the Gilcrease structures are tentatively scheduled for 2025.

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 1606 acres are mowed per cycle (combined total for the Creek and Gilcrease Turnpikes).

*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 of stormwater runoff to receiving streams.

*Roadways:*

All storm grates and drains used to move water off 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 950 cubic yards of litter were collected and properly disposed of by Creek Turnpike Maintenance staff. Approximately 50 cubic yards of litter were collected from the Gilcrease Turnpike and properly disposed of by Turner 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 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 and four certified applicators on the Gilcrease Turnpike. Herbicide was applied around sign footings, fences, center medians and at various other locations within the limits of the right of way. Approximately 480 gallons of herbicide were applied on the Creek Turnpike and 350 gallons of herbicide were applied on the Gilcrease Turnpike.

*Illicit Discharge and Improper Disposal:*

The bridges and culverts on the Creek Turnpike are inspected every other year. The Creek Turnpike culverts were inspected in 2023 and will be inspected again in 2025. The Creek bridges were inspected earlier this year and will be inspected again in 2026. The Gilcrease bridges will be inspected for the first time in 2024 and the Gilcrease culverts will be inspected for the first time in 2025.

OTA's maintenance staff collects and recycles oil. The oil is picked up twice a year at the Creek Turnpike 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 248 gallons of oil, 183 filters, 14 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 (SWMP) and Erosion Control Plan (ECP).

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.

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, 2023 – June 30, 2024, the OTA received 341 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 still in negotiation to become a co-permittee with ODOT in a non-traditional MS4 permit. Once the non-traditional permit is finalized, 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
Inspections	15,000.00
Mowing	166,750.00
Sweeping	51,592.46
Trash Collection and Disposal	159,467.00
Herbicide	21,995.00
Total	\$ 414,804.46

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. .

## 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.



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

08/23/2024

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Date