



# Stormwater Management Strategic Plan

City of Santa Fe, New Mexico







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## EXECUTIVE SUMMARY



USEPA Region 6  
regulates urban  
stormwater through the  
National Pollution  
Discharge Elimination  
System Municipal  
Separate Storm Sewer  
System Permit program.  
For more information,  
visit

<https://www.epa.gov/npdes/stormwater-discharges-municipal-sources>.

## Executive Summary

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Santa Fe's excellent quality of life is renowned in the region and across the country; and water—in the river, in the ground, and falling from the sky—is a crucial part of creating the “human habitat” that makes Santa Fe unique. In the fragile high-desert environment to maintain a sustainable ecosystem and the quality of life residents expect, the City needs to be proactive and use all available water resources. Further, the City is required by a permit issued by the U.S. Environmental Protection Agency (USEPA) to manage the discharge of stormwater to minimize the pollution of the Santa Fe River. This permit will be reissued in 2018, and the City anticipates additional, more prescriptive requirements. USEPA compliance audits are typical after the issuance of a new permit. A changing climate and these new regulatory requirements necessitate a broader view of how the City manages stormwater runoff, which has historically been regarded as a nuisance. In addition, stormwater is now seen as a valuable resource with unrealized opportunities.

In the 1990s, the City of Santa Fe began requiring private developers to mitigate off-site erosion by detaining stormwater on-site; however, current research indicates that this approach can be enhanced by infiltrating rainwater into multifunctioning landscapes. Infiltrating rainwater into green infrastructure and low impact development stormwater controls provides numerous water-related benefits beyond preventing erosion such as water quality treatment and aquifer recharge. In addition, vegetation supported by the infiltration of stormwater can be used in multifunctioning landscapes to:

- Encourage walking and biking by providing shade and traffic calming,
- Clean urban pollutants from the air,
- Reduce the urban heat island effect,
- Provide wildlife habitat and migration corridors,
- Improve residents' overall sense of well-being,
- Improve health outcomes of the ill,
- Increase property values,
- Support commercial retail and restaurant businesses,
- Reduce crime, and



- Reduce the need for irrigation, thereby reducing potable water treatment and distribution costs and associated energy usage.

These benefits align directly with goals established in the *Sustainable Santa Fe 25-Year Plan, Parks, Open Space, Trails & Recreation Master Plan*, and *City of Santa Fe Land Use & Urban Design Plan*.

In 2016, recognizing the value of these benefits, the City Council passed Resolution No. 2016-25 directing the City Manager to develop a program that updates the City's stormwater management policies in furtherance of the City's environmental protection and sustainability policies and goals. Chapter 3 describes in detail the directives contained in this resolution.

In response to this resolution, the Santa Fe River, Watershed, and Trails Division of Public Works drafted a report titled *An Infiltration Model for Enhanced Stormwater Management: A Preliminary Report for the City of Santa Fe, New Mexico*. The report endorsed the new model for managing stormwater, which encourages the infiltration of rainwater rather than allowing it to run off and provided a set of recommendations as a starting point to ensure the new model was successful. These recommendations serve as the foundation for this *Stormwater Management Strategic Plan*.

In 2017, the River, Watershed, and Trails Division applied for, and was awarded, a USEPA technical assistance grant. USEPA provides long-term stormwater management planning assistance to communities across the country. Santa Fe is one of five communities working with USEPA to sync planned and future activities happening in the community to support long-term stormwater management planning. Also, in 2017, the City began a





12-month collaboration with USEPA to establish goals to support a long-term stormwater vision and to develop two specific elements necessary to sustainable long-term stormwater management planning – *A Guide to Incorporating Green Infrastructure into Roadway Projects in Santa Fe* and *Government Funding Opportunities for Stormwater Management in Santa Fe*. USEPA staff coordinated closely with the City’s planning team. Chapter 2 details further the USEPA effort.

Resolution No. 2016-25 authorized the hiring of a third party to explore alternate stormwater management concepts, so in 2017, the City funded a comprehensive evaluation of the existing stormwater management program. This evaluation included a review of existing programs that play a role in stormwater management, an update of the City’s existing drainage management plans, a fiscal analysis of budget and revenues, and an evaluation of current data and asset management processes.

The consultants and River, Watershed, and Trails staff (the planning team) spent more than a year conducting interviews, reviewing existing documentation, and conducting analyses. Staff from the following departments were interviewed during the evaluation: Finance, Information Tech and Telecommunications, Land Use, Parks and Recreation, Public Utilities, Public Works, and the Santa Fe Metropolitan Planning Organization. In addition, the team reviewed a variety of documents, including the City’s existing stormwater discharge permit, the Middle Rio Grande general permit, the City’s recent annual reports to USEPA, the City of Santa Fe Municipal Code, and the Sustainable Santa Fe plan. During the fiscal analysis of stormwater fees and budget, the team reviewed operating budgets, annual reports, capital improvement plans, and other documentation of the stormwater program and



related City divisions engaged in the design, construction, maintenance, and operation of stormwater facilities and services. The team inventoried existing asset management approaches in different departments in the City and conducted interviews with relevant staff.

The team conducted modeling for water quality and flooding in the Santa Fe River and Arroyo de los Chamisos watersheds to better assess flooding conditions, erosion, and pollutant loading and to determine locations for improved stormwater management controls. The City will be able to use the resulting model in the future to prioritize stormwater management controls based on benefits and costs. The team inventoried and evaluated existing datasets and created new datasets that will help guide the continued development of modeling tools.

Chapter 2 describes the evaluation processes in greater detail.

The team identified deficiencies that were either possible permit noncompliance or program inefficiencies or both. These deficiencies are described in Chapter 3. These findings and themes



were then presented to an internal stakeholder group for review during a facilitated meeting. The group prioritized the themes and developed a set of recommendations for turning the deficiencies into opportunities:

- Revise Code of Ordinances
- Improve program management
- Create equitable rate structure and ensure revenue
- Strengthen stormwater requirements for private development
- Integrate innovative stormwater management into City facilities and rights-of-way
- Practice good housekeeping and pollution prevention at City facilities
- Map and manage stormwater infrastructure and assets
- Educate Santa Fe Residents about stormwater management

Chapter 4 discusses these recommendations in detail in addition to specific implementation strategies which will provide residents with multiple valuable benefits as well as helping to ensure long-term program viability and regulatory compliance.





# CHAPTER 1: INTRODUCTION

## Chapter 1: Introduction

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In 2016, the Santa Fe City Council passed Resolution No. 2016-25 directing the City Manager to develop a program to update the City's stormwater management policies in furtherance of the City's environmental protection and sustainability policies and goals. This plan is the culmination of the work done by the City to date in response to that directive.

### Purpose & Goals of the Plan

In 2016, the Santa Fe City Council passed Resolution No. 2016-25 supporting the use of infiltration through green infrastructure and low impact development controls—on public and private lands. Based on this resolution, a planning process was initiated, and this *Stormwater Management Strategic Plan* is the result of that process. This plan serves as a roadmap for decision makers to use to institutionalize a proactive, compliant, and sustainable stormwater management philosophy based on the infiltration model. It will guide decision makers toward maintaining compliance and implementing policies that will not only protect but also enhance Santa Fe residents' quality of life.

To this end, the Plan has three broad goals:

1. Build on prior work and use staff input to maximize program opportunities and eliminate program redundancies.
2. Ensure compliance with existing and anticipated regulatory requirements.
3. Proactively support existing City goals by incentivizing or requiring the use of multifunctioning landscapes on private and public land.





## CHAPTER 2: THE EVALUATION AND PLANNING PROCESS



## Chapter 2: The Evaluation and Planning Process

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### Background

In 2016, the Santa Fe City Council passed Resolution No. 2016-25 directing the City Manager to develop a program to update the City's stormwater management policies in furtherance of the City's environmental protection and sustainability policies and goals.

In response to this resolution, the Santa Fe River, Watershed, and Trails Division of Public Works drafted a report titled *An Infiltration Model for Enhanced Stormwater Management: A Preliminary Report for the City of Santa Fe, New Mexico*. The report endorsed a new model for managing stormwater, which encourages the infiltration of rainwater rather than allowing it to run off and provided a set of recommendations as a starting point to ensure the new model was successful. These recommendations serve as the foundation for this *Stormwater Management Strategic Plan*.

Resolution No. 2016-25 authorized the hiring of a third party to explore alternate stormwater management concepts, so in 2017, the City funded a comprehensive evaluation of the existing stormwater management program. This evaluation included a review of existing programs that play a role in stormwater management, an update of the City's existing drainage management plans, a fiscal analysis of budget and revenues, and an evaluation of current data and asset management processes. The results of this evaluation were used to develop strategies necessary to have a compliant, efficient, and effective stormwater management program.

This chapter describes the evaluation process in detail.

### Existing Stormwater Management Program Evaluation

The consultants and River, Watershed, and Trails staff (the planning team) spent more than a year conducting interviews, reviewing existing documentation, and conducting analyses.



## Interviewed Departments:

### Public Works

- Facilities
- Engineering
- Streets/Drainage Maintenance

### Land Use

- Building Permits
- Current Planning
- Technical Review
- Inspections/Enforcement

### Parks and Recreation

### Public Utilities

- Environmental Services/Solid Waste
- Wastewater
- Water
- Sustainable Santa Fe
- Keep Santa Fe Beautiful

### Finance

- Budget

### Information Technology & Telecommunications

- Infrastructure Services

### Metropolitan Planning Organization

The program evaluation had two primary objectives:

- To determine how the City needed to refine existing programs to ensure compliance with the existing MS4 permit and the new requirements anticipated in the reissued permit
- To identify any operational and administrative inefficiencies, redundancies, or opportunities for improvement

Over three consecutive days, the team conducted individual and group interviews of nearly thirty staff members from City departments. Staff involved with stormwater management were asked questions that delved into a variety of administrative, organizational, and technical topics such as the following:

- Program management, specifically staffing, communication, and coordination
- Legal authority and enforcement mechanisms
- Facilities planning, operation, and maintenance
- Regulation of development projects—both during and after construction
- Practices used to prevent illicit discharges into the storm sewer system

The team also reviewed a variety of documents, including the City's existing stormwater discharge permit, the Middle Rio Grande general permit, the City's recent annual reports to USEPA, and the *Sustainable Santa Fe Plan*.

In addition to this comprehensive review, the team conducted more focused reviews of the City's municipal code, budgets and revenues, and asset management processes.

### Municipal Code Review

The team conducted a thorough review of the City's municipal code to identify revisions necessary to comply with the draft USEPA MS4 Permit, to address findings of the stormwater management program evaluation, and to eliminate stormwater management implementation barriers.

The team developed a redline version of the pertinent sections of code and summarized the 10 primary recommended revisions with associated rationale. Revisions were proposed for the following code sections and are summarized in Chapter 3:

- Chapter 13 Stormwater Utility
  - Article 13-1 Stormwater Utility Service Charge
  - Article 13-2 Stormwater Illicit Discharge Control
- Chapter 14 Land Development
  - Article 14-8 Development and Design Standards
    - Section 14-8.2 Terrain and Stormwater Management
    - Section 14-8.3 Flood Regulations
    - Section 14-8.4 Landscape and Site Design
    - Section 14-8.5 Walls and Fences
    - Section 14-8.6 Off-Street Parking and Loading
    - Section 14-9.1 General Purpose and Applicability
    - Section 14-9.2 Street Improvements and Design Standards
- Chapter 25 Water
  - Article 25-2 Comprehensive Water Conservation Requirements
    - Section 25-2.7 Outdoor Conservation

## Financial Analysis

The team evaluated the budgets and revenues for the City's stormwater management program. The objective of the financial review and analysis was to develop a conceptual financial planning model to support strategic planning for the City's stormwater program.

The team also reviewed the current rate structure against alternative rate designs that can enhance equity between customer classes and that offer incentives in the form of rate adjustments and/or credits.





## EPA Long-Range Planning Process

To complement the City's strategic planning effort, in 2017, the River, Watershed, and Trails Division applied for, and was awarded and accepted into a technical assistance program from USEPA to improve long-term stormwater planning at the community level. Santa Fe is one of five communities selected to participate in the technical assistance program throughout the country. In September 2017, USEPA, the City planning team, and the New Mexico Environment Department met to discuss long-term stormwater planning objectives and priorities. Participants took a tour of the City that highlighted Santa Fe's stormwater challenges and opportunities. The City and USEPA also hosted a public forum during which external stakeholders were invited to provide input on the long-term stormwater planning goals. An additional meeting was held with representatives from various City departments to discuss Santa Fe's stormwater-related challenges and a long-term stormwater vision, and to begin developing long-term goals.

Through the initial stakeholder engagement process, the City identified several specific goals for long-term stormwater planning, including expanding the use of green infrastructure and low impact development in public and private projects, developing reliable funding sources dedicated to the City's stormwater programs and projects, and aligning stormwater efforts with the City's broader responsibilities.

USEPA developed two documents to support the City's stormwater management strategic objectives: *A Guide to Incorporating Green Infrastructure into Roadway Projects in Santa Fe* and *Government Funding Opportunities for Stormwater Management in Santa Fe*.

The team reviewed operating budgets, annual reports, capital improvement plans, and other documentation of stormwater program financing within City divisions engaged in the design, construction, maintenance, and operation of stormwater facilities and services. Interviews were conducted with program staff and with the Public Works and Finance departments. Questions addressed current revenue sources, anticipated changes in the ratepayer base, alternative funding sources and the refinement of the current rate structure by improving equity, and providing credits for benefits and incentives to reduce stormwater impacts. Finally, City staff were questioned regarding available data that could be used to support such refinements.

The team produced a model that integrates the stormwater management program's forecasted costs (for operations, maintenance, and capital projects) with anticipated revenues (rate revenues, internal fund transfers, and external grant funds). To support the expansion of capital investment, the model's functionality provides for debt financing as well. Chapter 3 provides more details regarding the model's assumptions, limitations, and outcomes.

## Asset Management

For a city, *asset management* is the process of maintaining a desired level of service at the lowest life cycle cost. *Lowest life cycle cost* refers to the best appropriate cost for rehabilitating, repairing, or replacing an asset. Asset management is implemented through an asset management program and typically includes a written asset management plan. Santa Fe does not currently have a formal asset management plan. As part of the strategic planning process, however, the team evaluated ways in which the City could improve asset tracking, operation, and maintenance while advancing watershed-based stormwater management outcomes. The team interviewed staff and evaluated existing asset management datasets and systems. City staff

collaborated with the team to establish asset management goals and develop key recommendations in support of the *Stormwater Management Strategic Plan*. Chapter 4 details these recommendations.

## Water Quality and Flood Modeling

The team conducted modeling in the Santa Fe River and Arroyo de los Chamisos watersheds to assess flooding conditions, erosion, and pollutant loading and to identify locations to implement improved stormwater management controls. The team also ensured that the model used in this effort could be used in the future to prioritize implemented controls based on benefits and costs.

The team inventoried and evaluated existing datasets, identified data gaps, and created new datasets to help guide the continued development of modeling tools. Data provided by the City was preprocessed using ArcMap. XPSWMM and LSPC models were built based on existing and field-collected data and used to update the Santa Fe River and Arroyo de los Chamisos drainage plans developed in the late 1990s.

The team interviewed staff, conducted site visits, and reviewed existing documents such as the Santa Fe Watershed Association 2016 *Arroyo Threat Assessment Report*. This information—in conjunction with model outputs—was used to recommend high-priority pilot project areas for green infrastructure projects as well as data acquisition needs, future modeling efforts, stormwater management program revisions, and water quality monitoring approaches.

The City hosted two external stakeholder input events to which local stormwater professionals and community advocates were invited to review and comment on the modeling process and



outcomes. The planning team used the input from these stakeholders to craft the final recommendations.

## Strategy Development

Throughout the strategic planning process (i.e., evaluating and modeling the existing program), the team identified deficiencies that indicate either possible noncompliance with the USEPA MS4 permit, program inefficiencies, or both and made discrete findings that were collapsed into overall finding “themes” (see Chapter 3). The team then presented these findings and themes to an internal stakeholder group for review during a facilitated meeting. The group prioritized the themes and developed a set of proposed strategies for turning the deficiencies into opportunities (see Chapter 4).





## CHAPTER 3: STORMWATER CHALLENGES & EVALUATION FINDINGS



## Municipal Separate Storm Sewer System

An MS4 is a conveyance or system of conveyances that is:

- owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.,
- designed or used to collect or convey stormwater (e.g., storm drains, pipes, ditches),
- not a combined sewer, and
- not part of a sewage treatment plant, or publicly owned treatment works (POTW).

## Chapter 3: Stormwater Challenges & Evaluation Findings

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The City of Santa Fe is faced with a number of stormwater management challenges that, with commitment, planning, and investment, can be turned into significant opportunities. Santa Fe, like other cities, provides certain services to residents, including the management of stormwater using the public rights of way and storm sewer infrastructure. Without proper management, runoff from storms can cause erosion of the arroyos, acequias, and Santa Fe River as well as carry pollution into the river that can impact ecological biodiversity. Further, uncontrolled stormwater can damage private property as well as public assets and infrastructure. With the use of proper management techniques, however, stormwater can be a resource for Santa Fe residents instead of a source of damage and pollution. In addition, because of the pollution potential, stormwater runoff from Santa Fe is regulated through the U.S. Environmental Protection Agency (USEPA) MS4 permit which requires control of the pollutants in the runoff.

This chapter summarizes the City's stormwater challenges and related evaluation findings, which highlight program inefficiencies and potential permit violations. As described in Chapter 2, a City internal working group prioritized the findings of the evaluation for action. The following sections present primary findings and identify each with an alphanumeric indicator. Narrative rationale follows each finding.

Chapter 4 describes the strategies recommended to address these challenges, meet permit requirements, and realize the multiple benefits that can be gained from stormwater control measures. By implementing controls required by the City's permit and other creative stormwater strategies identified in Chapter 4 of this plan, the City can manage stormwater as a resource rather than a nuisance.

High priority strategies to address the evaluation findings are identified in Chapter 4.



## Total Maximum Daily Load

A TMDL establishes the maximum amount of a pollutant allowed in a waterbody and serves as the starting point or planning tool for restoring water quality.

## Stormwater Challenges

Runoff from parking lots, rooftops, and roadways enters arroyos and the Santa Fe River via overland flow and the storm sewer system. The volume and velocity of this water cause erosion, and pollutants carried by the runoff can pollute waterways. According to the *State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated List and Report*, the Santa Fe River is currently impaired because of excessive sediment and nutrients (stream bottom deposits), bacteria (*Escherichia coli* [*E. coli*]), and high temperatures.

To address these impairments, the New Mexico Environment Department has developed total maximum daily loads (TMDLs) for the river that require reductions in pollution. The City is required to reduce the amount of harmful bacteria in stormwater runoff. These requirements are implemented via the City's existing MS4 permit in addition to other minimum control measures to minimize pollutants in stormwater. These minimum measures include construction site stormwater runoff controls, post-construction stormwater management in new developments, pollution prevention and good housekeeping at municipal operations, illicit discharge controls, control of floatables, public education and outreach, and public involvement and participation. USEPA requires all of these controls to ensure that the City is adequately managing stormwater to prevent impacts on receiving waters.

While the City is growing at a relatively slow pace, every new development brings additional impervious surfaces with the potential to cause additional damage to waterways. The more pavement, rooftops, and driveways there are, the more stormwater will be generated during storms that the City must manage.

The City is regulated under NPDES MS4 Permit No. NMR040000 currently, but anticipates a new, more prescriptive permit by the end of 2018.

In addition, research shows that climate change will result in warmer temperatures and droughts in the Santa Fe region in the future, as well as heavier rain events. These events, such as the one that occurred on July 23, 2018, may result in more flooding and erosion of the arroyo systems and discharge of pollutants to the Santa Fe River if



stormwater is not adequately managed on private and public properties. The City's storm sewer infrastructure is facing increased pressure from storms and the creation of new impervious surfaces.

Finally, while the City is a leader in water conservation efforts, the 2015 *Santa Fe Basin Study*<sup>1</sup> identified a future unmet water supply demand of 5,000–9,400 acre-feet in the year 2055 if no additional steps are taken to either reduce demand or augment current supplies. Irrigation water for landscaping is a major source of demand in the City of Santa Fe; this demand could be offset through stormwater infiltration practices and infiltration of rainwater to recharge groundwater supplies.

Santa Fe's stormwater challenges are more accurately characterized as water challenges—how to manage rainfall, ensure adequate supply, and protect groundwater and surface water resources from pollution in a cost-effective and compliant manner. These challenges and associated permit requirements formed the basis of the evaluation findings detailed in this chapter.

In April of 2007, the Santa Fe River was named America's Most Endangered River by American Rivers, a Washington, DC-based advocacy group. In June 2007, the New Mexico Heritage Preservation Alliance named the Santa Fe River as one of the state's 12 most endangered places.

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<sup>1</sup> <https://www.usbr.gov/watersmart/bsp/docs/finalreport/SantaFe/Santa-Fe-Basin-Final.pdf>



## Evaluation Findings

### Legal Authority

Effective stormwater management starts with having the authority to conduct a program. City codes must allow staff to set and enforce stormwater requirements. The draft, more prescriptive MS4 permit requires that the City have adequate legal authority to control stormwater discharges.

The City's legal authority to require implementation of stormwater management measures is contained in three main chapters of the Santa Fe Code of Ordinances: Chapter 13, *Stormwater Utility*; Chapter 14, *Land Development*; and Chapter 25, *Water*. The team reviewed these chapters of the Code and recommended revisions either because (1) the draft USEPA Small Municipal Separate Storm Sewer System Permit No. NMR040000 requires municipal code updates or (2) code updates were necessary to address findings of the stormwater management program evaluation.

LA-1

**Overall, the Code contains inadequate active construction best management practices, post-construction stormwater management performance standards, and enforcement authority for stormwater management.**

The Code does not currently require development projects to meet a retention performance standard for post-construction stormwater management. The draft MS4 permit requires that this standard be applied to all projects of one acre or larger (Part I.D.5.b.). Applying this standard will support the use of low-impact development techniques on private development projects.

The Code does not currently require that new development projects treat stormwater to remove sediment prior to discharge to the City's storm sewer. This requirement is not included in the draft MS4 permit; however, reducing the discharge of sediment to the storm sewer will improve water quality in the river and will reduce the City's infrastructure maintenance needs (i.e., catch basins and storm sewer pipes).

The existing Code does not specify requirements for the long-term operation and maintenance of stormwater management controls on private development projects and

## Predicted Climate Change Effects for the Santa Fe Watershed

According to the Santa Fe Watershed Association's *Forest and Water Climate Adaptation, A Plan for the Santa Fe Watershed*, the projected changes in volume and timing of available water from the Santa Fe Watershed include:

- 11-18% decrease in stream flow above the City's McClure Reservoir by 2060.
- 20-70% reduction in March snowpack by 2050, and up to 100% reduction by 2070.
- Reduction of Middle Rio Grande water of 14% by 2030, and 29% by 2080.
- Spring snowmelt runoff 15-35 days earlier, resulting in the McClure and Nichols reservoirs filling quickly or overflowing in the spring, and less water available overall during summer.
- Increased risk of catastrophic forest fires and resulting soil erosion into reservoirs.
- Higher frequency of spring floods from more violent and heavy thunderstorms, resulting in more property damage.



does not require property owners to proactively inspect the controls to optimize performance. The draft MS4 permit requires that the City have procedures for site inspection and enforcement to ensure proper long-term operation, maintenance, and repair of stormwater control measures. Further, City staff indicated that failing stormwater control measures on private

property are a significant administrative and maintenance burden. If controls fail, the City's only recourse is to use City staff and equipment to make the necessary repairs and then bill the property owner. This practice has proved to be inefficient and costly.

There are no administrative penalties available to City staff when enforcing stormwater-related code violations. Having only civil or criminal monetary penalty options limits inspection staff's ability to quickly address noncompliance due to illicit discharges. The Code does not contain adequate enforcement actions to address stormwater management violations during active construction. Enforcement actions such as stop work orders or revoking a project's grading permit are typically quite effective during active construction and are integral to a typical enforcement escalation procedure for construction-related stormwater violations.

The Code does not currently require that large projects phase land disturbance (i.e., grading) to help control dust and surface erosion during rain events. The existing Code indicates that phasing may be required on projects at the discretion of the city engineer; however, having a standard phasing requirement ensures that developers will automatically plan a project in this way, rather than having to adjust after submittal of a preliminary plan. During interviews, staff indicated that large, unphased projects have caused considerable dust and runoff issues in the past.

Adequate temporary site stabilization requirements are not included in the current Code. It does not include a timeframe for using temporary stabilization or require that stockpiles be protected daily.

**Low-impact development (LID)** techniques are site-scale strategies that use infiltration, evapotranspiration, and use of stormwater to manage runoff on development sites. LID techniques can reduce the impact of built areas and promote the natural movement of water within a watershed. Many LID techniques—such as rain gardens, infiltration basins, bioswales, curb cuts, and permeable pavements—use the infiltration model to manage stormwater. Santa Fe encourages the use of native, drought-tolerant plantings to promote infiltration in LID techniques.



During interviews staff indicated there are significant issues with managing dust and runoff during construction caused by unprotected bare areas and stockpiles.

Finally, the City does not currently specify either in the Code or in any related policy the enforcement escalation procedures for addressing noncompliance recidivism. The draft MS4 permit requires that the City have enforcement escalation procedures in place.

## Program Management

City governments have a responsibility to residents to protect natural resources and public property through their programs and practices in an efficient, cost-effective manner. A supported and institutionalized organization structure is necessary to implement a compliant and sustainable stormwater management program. Further, because of the diverse impacts of stormwater in Santa Fe, many departments are involvement in its management, making communication among these departments critical to program success.

**PM-1** The City has a diffuse program management structure that assigns significant stormwater program management responsibility to the River, Watershed, and Trails/Stormwater Section within the Engineering Division of the Public Works Department and distributes implementation responsibilities across multiple City departments.

Currently, dedicated stormwater operation and maintenance staff are housed in the Streets and Drainage Division of Public Works. While this division does address some drainage issues within the right-of-way, the draft MS4 permit requires that stormwater management be implemented on all City facilities and on private parcels as well. As demonstrated by the wide variety of staff that participated in the program evaluation, stormwater management responsibilities span many departments (see Figure 1 for an

organizational chart which includes all departments which have a stormwater management role). The proper positioning of stormwater staff and clarity of roles within the City organization is critical to ensure necessary management support and interdepartmental coordination.

Distributing water-related compliance and management requirements among a variety of departments may be resulting in permit noncompliance and inefficient use of resources. For example, interviews revealed that both the Land Use Department and the River, Watershed, and Trails/Stormwater section staff are conducting inspections of active development projects that are larger than one acre.

Because the City does not have established level of service (LOS) goals for stormwater management (see Asset and Data Management), existing staff job descriptions do not adequately address stormwater management responsibilities. Based on staff interviews and a review of existing job descriptions, many staff are unclear on their roles in MS4 permit compliance.

**PM-2** Inadequate communication among departments regarding water-related permit requirements could make the City vulnerable to permit noncompliance and could limit partnerships and cooperation that could be financially beneficial to the City.

The City does not have an internal stormwater management committee or organization chart to identify staff responsible for various permit-required responsibilities. In addition, there is no response tree for stormwater-related issues identified by the public or in the field. For example, interviews indicate that many staff do not know who the appropriate people are to call to remedy stormwater issues that may arise, particularly with regard to arroyo management.

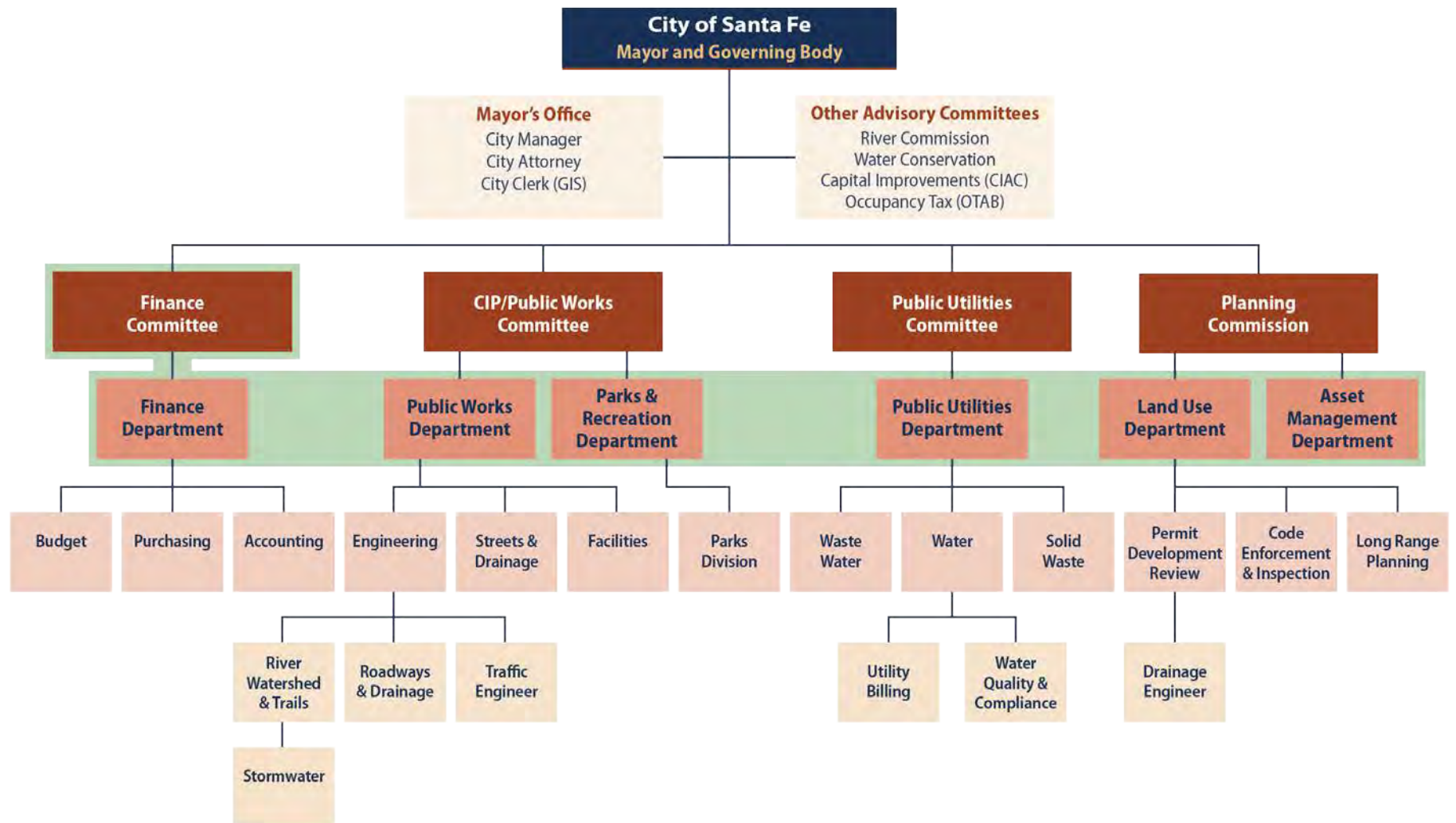


Figure 1 Organizational Chart



Of particular concern is the lack of coordination between stormwater staff and pretreatment staff on regulating pumped groundwater. Currently, the City has no formal process for requiring pumped groundwater to be permitted and discharged to the sanitary sewer unless the discharger samples to confirm no contamination exists.

In addition, stormwater staff are not consistently included in City asset management activities and facilities planning as necessary to ensure permit compliance and efficient use of resources.

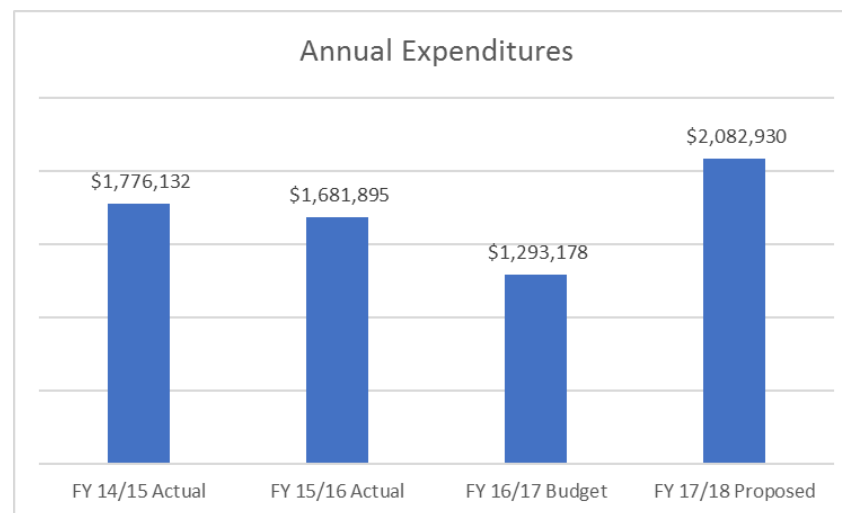
## Revenues and Expenditures

To ensure that programs are implemented in a cost-effective manner, it is essential that expenditures are planned and tracked and that a stable source of revenue is available to ensure permit compliance.

RE-1

**The present rate of revenue generation by the Stormwater Utility Service Charge Fee (“utility fee”) is not sufficient to sustain the current scope of the stormwater program, and the scope of stormwater activities will necessarily expand to achieve regulatory compliance and meet other identified needs.**

Stormwater-related expenditures have varied over recent years (Figure 2). Expenditures budgeted for the current fiscal year (\$2,082,930) exceeds the estimated annual revenues of \$1,570,000 generated by the Stormwater Utility Service Charge Fee. The Storm Water Fund 21401 has a projected fiscal year-end balance of \$973,474. At the current pace of revenues and expenditures, the balance surplus will be fully depleted during FY19/20.



**Figure 2 Annual Stormwater Expenditures**

While many stormwater assets are built by private developers and accepted by the City as public infrastructure, some are built by the City using the general fund and the utility fee. Storm drain system maintenance is performed by the Streets and Drainage Maintenance Division of Public Works and by the Parks Department. This work involves cleaning storm drainage pipes, culverts, and catch basins; routine repairs and minor capital improvements; vegetation management in arroyos and roadway medians; erosion repairs and sediment management; and storm recovery (clearing debris).

The scope of stormwater-related activities will expand to meet pending regulatory obligations anticipated in the draft MS4 permit and to address other operating and capital needs. (Many of these requirements are described later in this chapter.) These activities will require additional revenues beyond the currently allocated funding resources.

## Near-term priority actions that will require additional staffing and capital expense:

### Capital Program

- Require stormwater control measures at new City facilities to meet the performance standard specified by the draft MS4 permit and flood control measures to also address water quality. This would affect capital budgets of departments constructing the facilities.

### Operations & Maintenance

- Conduct post-construction stormwater facility inspection, maintenance, and operation consistently of City facilities.
- Consistently require and inspect erosion and sedimentation control practices on private development projects.
- Consistently require and inspect post-construction operation and maintenance on private stormwater control measures.
- Complete and maintain mapped inventory of public and private stormwater infrastructure assets.
- Develop and implement formal training on design, installation, and maintenance of post-construction stormwater controls.

### Planning & Engineering

- Complete a comprehensive inventory of stormwater infrastructure needed for watershed modeling, siting water quality best management practices, determining monitoring locations, building an asset management program, and documenting maintenance concerns and compliance with MS4 program requirements.
- Complete a detailed impervious cover dataset based on the existing LiDAR data and new high-resolution aerial imagery acquired for support of several stormwater program elements, including watershed and system modeling, developing a runoff-based stormwater utility fee, and stormwater planning.
- Prepare and adopt refined stormwater system criteria addressing water quality, stream stability, sediment transport, and stormwater volume management.
- Update the water quality monitoring program to comply with the draft MS4 permit to both necessitate water quality data acquisition and analysis, and acquire runoff rate and volume measurements to verify watershed-scale modeling and local design parameters.



Greater levels of expenditures will be required to execute the City’s obligations under the proposed MS4 permit and to plan and implement projects addressing flooding, erosion, and water quality.

Further, current policies do not provide direction or priorities to fund and implement projects and actions that improve drainage and water quality and do not clearly establish priorities for the expenditure of stormwater fee revenues.

**RE-2** | **The utility fee rate structure does not provide rate equity among customers, nor does it provide for incentives for beneficial on-site stormwater management practices.**

Utility fee charges are collected through the City’s water utility billing system, as set forth in Santa Fe’s Code of Ordinances Chapter 13, *Stormwater Utility*. The charges are based on a flat monthly rate (see Table 1), with charges assigned to customers based on the size of the water meter serving the property.

There is little to no nexus between water meter size and a property’s contribution of runoff volume, rate, or quality that define a parcel’s “demand” for stormwater service. This produces a low level of equity across customer classes and among individual customers. As an example, a parcel occupied by a large parking lot, which does not have a water service, does not receive a charge for the stormwater it generates; whereas a residence with a relatively small footprint is charged a fee.

Further, the present structure of the utility fee is inflexible, with no basis for extending incentives or credits to customers for taking measures to reduce the rate or volume of storm runoff or to improve runoff water quality.

**Table 1. Current Stormwater Utility Rate Structure Charges**

	Meter Size	Service Charge
<b>Residential</b>	All meters	\$3.00
<b>Commercial</b>	<sup>5</sup> / <sub>8</sub> -inch	\$3.00
	<sup>3</sup> / <sub>4</sub> -inch	\$4.50
	1 inch	\$7.50
	1½ inch	\$15.00
	2-inch	\$24.00
	3-inch	\$46.80
	4-inch	\$75.00
	6-inch	\$150.00
	8-inch	\$240.00

**RE-3** | **Certain activities of the stormwater program are continuous, ongoing functions and are not being reliably funded to meet City requirements or external regulatory obligations, or to ensure properly functioning infrastructure.**

As noted earlier, the City has occasionally supported selected stormwater projects and activities through other sources beyond the stormwater utility service charge, including the General Fund and outside grants. These are not reliable sources of funding. Activities such as storm sewer system maintenance and operation activities; administration; and reporting, planning, and enforcement activities should be funded through the service charge.

## Private Property Stormwater Management

Construction sites can be significant sources of sediment, trash, and chemicals. Land-disturbing activities—land clearing, grading, building demolition, stockpiling, excavating, compaction, and earth moving—expose loose sediment, which increases erosion and sedimentation. In addition, cities are, by their nature, developed areas. They include a high percentage of impervious surfaces—buildings, parking lots, driveways, sidewalks, and roads—that generate much more runoff than when those same areas were open space. Requiring and incentivizing the reduction of new impervious cover on development projects and incorporating less impervious cover in public projects results in less stormwater for cities to manage.

The draft MS4 permit requires the City of Santa Fe to have a program to reduce the discharge of pollutants from active construction sites of one acre or more. In addition, the draft permit requires these same projects to be designed in a way that

minimizes water quality impacts after construction is complete. The following deficiencies were identified during the program evaluations. Both could be considered potential permit violations by USEPA if not properly addressed:

### **PPSM-1     Adequate erosion and sediment control practices are not consistently required on private developments.**

The City does not consistently include standard erosion and sediment control best management practice (BMP) requirements on construction project plan sheets and does not provide erosion and sediment control design guidance to engineers. This can lead to inadequate plans being submitted to the City for review.

The City does not use a standard checklist for review of grading plans. This can lead to inconsistent or inadequate plan review and could result in plans being approved that are not adequate to prevent discharges from construction projects.

The City does not require that drainage plans which detail stormwater control measures be kept on-site. This can make execution of required BMPs challenging for contractors and places an additional burden on City inspectors to explain requirements and to track any proposed or approved redline changes in the field.

Based on interview findings, the City does not consistently require final stabilization or removal of BMPs at the conclusion of projects. This can lead to active erosion after the project is complete.

### **PPSM-2     The City does not adequately require installation, operation, and maintenance of post-construction stormwater control measures on private development projects.**





As described previously in the Legal Authority section of this chapter, the City's current Code does not require development projects to meet water quality or channel protection performance standards for post-construction stormwater.

The City has not adopted design guidance or standards for designers to follow when incorporating stormwater management into site plans and does not consistently require preliminary plan review meetings to discuss stormwater management requirements. Stormwater management planning should occur early in the project development process to ensure proper placement and budgeting for installation and maintenance during construction.

Staff do not use checklists consistently to review site plans for compliance with post-construction requirements.

The City does not consistently require that applicants submit operation and maintenance plans to address stormwater management controls on development projects after construction is complete. The City requires stormwater agreements for some private facilities that are recorded but does not require as-built certifications or maintenance of areas intended for passive harvesting. The Land Use Department does not include ponds or landscaping in warranty inspections for facilities being accepted by the City.

After construction is complete, the City does not consistently inventory or map privately owned stormwater management controls. Developers are not required to submit geographic information system (GIS) mapping data layers for stormwater management controls and infrastructure.

The City does not conduct proactive inspections of private facility stormwater control measures or require property owners to self-

inspect. Stormwater control measures must be installed as designed and maintained correctly to operate as intended to protect water quality.

## **Public Property and ROW Stormwater Management**

**PPRW-1**

**Post-construction stormwater management considerations are not consistently included in planning procedures for new City facilities.**

Facilities planning staff do not consistently involve stormwater staff in facility planning to ensure that adequate erosion control BMPs and post-construction controls are in place.

Stormwater staff are not consistently notified when projects are completed, so often inspections are delayed. It is critical to inspect projects near letting so adequate BMPs can be installed prior to land disturbance.

According to staff interviewed, requests for proposals do not consistently include erosion and sediment control and post-construction elements necessary to ensure that qualified vendors apply. As a result, subsequent contracts for City projects do not include obligations for installing or maintaining adequate erosion and sediment controls or mechanisms for withholding payments if not performed as contracted.

Staff indicated that budgets for erosion control and post-construction stormwater management on public projects can be inadequate, which makes requiring additional plan submittals or implementing different/additional controls during construction difficult. Further, facilities maintenance staff are not consistently included in the planning of facilities; therefore, potential problems associated with future maintenance may not be accounted for during design.

The City has not adopted road specifications or details for designing stormwater management facilities in the rights-of-way and at City facilities that meet the retention standards required by the draft MS4 permit. Further, the City is not currently designing and installing stormwater control measures that meet this standard at new City facilities.

The City does not currently have formal storm sewer infrastructure design criteria or a design manual. According to staff interviewed, however, the City requires all public infrastructure to be designed to carry the peak runoff during a 100-year storm 24-hour storm event, which aligns with the discharge standards currently applied to private development projects (see Santa Fe Code of Ordinances §14-8.2(D)(4)(b)). Applying this standard only addresses prevention of localized flooding during large storm events and does not address water quality, stream stability, sediment transport, or stormwater volume management. This standard also does not

support the City's infiltration model of stormwater management.

#### PPRW-2

**Post-construction stormwater management considerations are not consistently included in capital improvement planning.**

The City is currently not targeting stormwater management capital improvement investments in the most appropriate areas based on results of flood control and water quality modeling and is not prioritizing green infrastructure strategies.

In addition, the draft MS4 permit requires that the City incorporate watershed protection elements into relevant planning documents—including capital improvement project plans—and include water quality criteria in the design of all flood control projects.

### **Good Housekeeping and Pollution Prevention**

#### GHPP-1

**Staff are not conducting good housekeeping practices consistently at City facilities and during City activities.**

Good housekeeping and safe storage and handling practices are essential at places like corporation yards, fleet maintenance facilities, material storage depots, and police and fire stations to ensure that chemicals, dirt and gravel, and other potential pollutants do not contact rainfall or runoff. Covering stored materials, performing certain activities indoors, and training staff on spill control and clean up are just a few of the ways that cities can keep their facilities clean.

City facilities do not have facility pollution prevention plans or other documentation describing the BMPs being used to control pollution from facilities that house equipment, maintain vehicles, store deicer, and conduct high-priority activities.





**Green infrastructure** strategies mimic natural processes to infiltrate, evapotranspire, or use stormwater on a regional scale to protect water quality. Green infrastructure uses plants, soils, and nature itself to manage stormwater and create healthier urban environments. Green infrastructure practices can be used to reduce the need for expensive gray infrastructure—pipes, storage facilities, and treatment systems—because plants and soils soak up, store, and use the rainwater. Green infrastructure can also recharge groundwater. Communities also can use green infrastructure to provide flood protection, cleaner air and water, and more appealing transportation corridors and outdoor spaces. Examples of green infrastructure strategies are green streets, infiltration buffers, managed open space, river-corridor improvements, and wetlands/bosques.

Low impact development (LID) techniques are site-scale strategies which use the same processes to manage stormwater on development sites. LID techniques can reduce the impact of built areas and promote the natural movement of water within a watershed. Many LID techniques—such as rain gardens, infiltration basins, bioswales, curb cuts, and permeable pavements—use the infiltration model to manage stormwater.



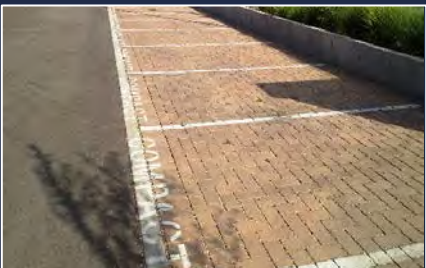
### **Green Streets and Parking**

Permeable pavement, bioswales, planter boxes, and trees integrated into street and parking lot designs to soak up and store stormwater and improve the pedestrian experience through shading and traffic calming.



### **Rain Gardens**

Shallow, vegetated areas that collect and absorb runoff from rooftops, sidewalks, and streets using plants and soil. Versatile, attractive features that can be installed in almost any unpaved space. Also known as bioretention or bioinfiltration cells.



### **Permeable Pavements**

Paved surfaces that let water soak into the ground, including pervious concrete, porous asphalt, and permeable interlocking pavers. They are particularly cost-effective where land values are high and where flooding or icing is a problem.

The City does not currently have standard operating procedures (SOPs) aimed at reducing pollutant discharges during activities with the potential to cause pollution such as snow removal, satellite storage of materials, and construction stockpile management.

**GHPP-2** | The City does not consistently include management of stormwater control measures in facility maintenance budgets and procedures.

The City does not conduct proactive inspections of city-owned stormwater management controls to ensure they are operating as designed. As previously discussed, facilities maintenance staff are not consistently included in planning new facilities to inform designers of potential issues with maintenance of stormwater controls at the beginning of the project. According to staff interviewed, existing facility budgets typically do not include adequate maintenance funding for stormwater management facilities. This leads to lack of maintenance and stormwater management controls not operating as designed.

Currently, the Parks Department is responsible for all maintenance of public facilities and within the rights-of-way. Field staff and management interviewed indicated that the Parks Department currently is not staffed at the numbers or with the skill level necessary to effectively maintain stormwater management controls in medians and on other public lands.

## Asset and Data Management

Asset management is maintaining a desired level of service for public assets at the lowest life cycle cost. Lowest life cycle cost refers to the most appropriate cost for rehabilitating, repairing, or replacing an asset. Asset management is implemented through an asset management program and typically includes a written asset management plan.

**ADM-1** | The City does not currently have a management plan for stormwater infrastructure and assets.

The City of Santa Fe uses multiple asset management programs across the different departments. There are separate asset management needs and software programs for facilities, financials, human resources, utilities, and billing. No single system used by City of Santa Fe staff currently provides the functionality of a GIS interface for data with backend functions for billing, tracking changes, and creating system reports. Further, the City has not established lowest life cycle goals for stormwater management services provided and has not conducted an inventory of stormwater assets. This lack of data makes it impossible to integrate stormwater assets into the existing management structures. The City is currently not properly forecasting stormwater management activities necessary to meet levels of service and ensure adequate funding and staffing.





ADM-2

**The City has inadequate mapping and modeling of public stormwater management assets and the storm sewer system to ensure adequate maintenance and permit compliance.**

The City's existing data record of stormwater infrastructure does not currently include all storm sewer inlets, underground pipes, manholes, roadway culvert crossings, and outfalls. This information is critical for refined watershed modeling, siting water quality stormwater control measures, determining monitoring locations, building an asset management program, and documenting maintenance concerns and compliance with MS4 program requirements.

ADM-4

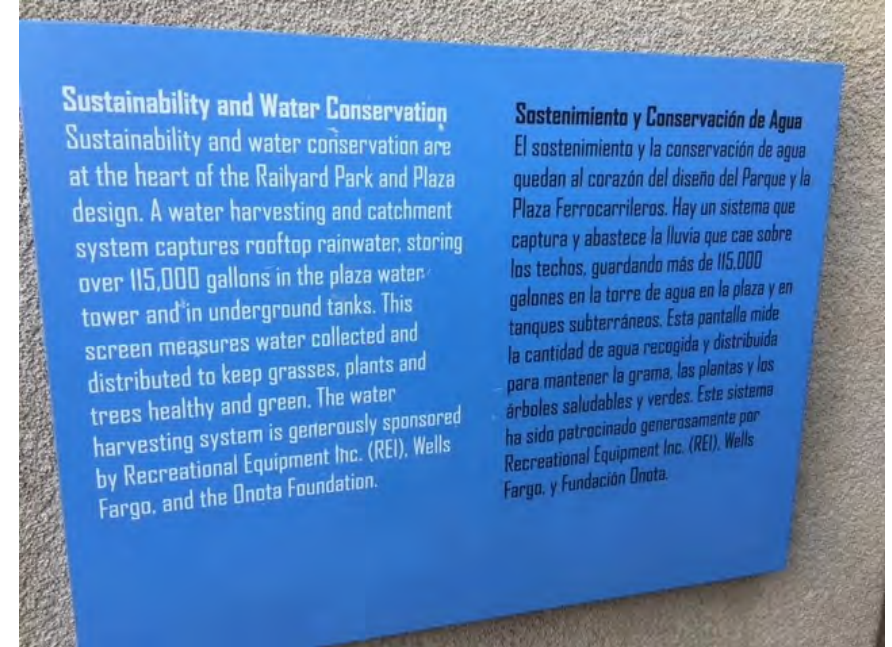
**The City is not conducting stream flow or targeted water quality monitoring.**

The draft MS4 permit requires monitoring for pollutants of concern within the City of Santa Fe's boundary. Conducting runoff rate and volume monitoring is also necessary to verify watershed scale modeling and local design standards.

ADM-3

**The City does not currently map or track directly connected impervious cover.**

The draft MS4 permit requires that the City estimate existing impervious cover and directly connected impervious cover (DCIA) and track the changes over time. The City does not have an impervious cover dataset based on new high-resolution aerial imaging required for impervious cover identification. These data also are necessary to create a more equitable discharge fee as discussed in the Revenues and Expenditures section of this chapter.



## Education and Training

ET-1

**The City has no formal programs to educate designers, contractors, consultants, or residents on design, installation, and maintenance of private stormwater control measures such as LID practices and erosion and sediment control practices.**

Staff interviewed noted numerous times that some engineering firms were not experienced in the design of stormwater control measures, particularly with LID strategies.

ET-2

**The City has no formal programs to train internal staff on the design, installation, and maintenance of stormwater control measures.**

In addition, Parks Department staff indicated that field crews were not adequately skilled to maintain LID strategies such as bioretention areas.





## CHAPTER 4: RECOMMENDED STORMWATER STRATEGIES



## Resolution No. 2016-25 Supported Directives:

- Employ and promote green infrastructure in all City infrastructure projects and improvements.
- Examine and implement ways to slow stormwater down, making it less destructive and allowing it to infiltrate better.
- Promote and further the City's urban watershed policy, employing green infrastructure improvements in all Public Works projects (e.g., roads, parks, and trails) to infiltrate stormwater, and use it more productively in parks and public places to decrease irrigation costs and prevent the runoff of fertilizers, waste products, and other contaminants.
- Examine ways in which stormwater can be used productively in Santa Fe.
- Develop a thorough and mapped understanding of the current stormwater system, including existing city drop inlets, storm drains, pipes, and outlet structures that flow directly into the arroyo system and the Santa Fe River.
- Consider how Public Works projects and private developments can create opportunities for an integrated approach to stormwater management.
- Provide recommendations from staff that would coordinate efforts of the above-mentioned departments, commissions, committees, and other entities [Public Works Department, Parks and Recreation Department, Public Utilities Department, City Land Use Department] to maximize opportunities while eliminating duplicative efforts.

## Chapter 4: Recommended Stormwater Strategies

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This chapter presents eight comprehensive stormwater management recommendations and associated strategies for implementation. They represent proposed updates to the City's policies to support a new model for managing stormwater that would encourage the infiltration of rainwater. In addition, implementation of these strategies will provide residents with valuable benefits as well as ensure long-term program viability and regulatory compliance. Finally, the recommended strategies directly align with and support many of the directives included in Resolution No. 2016-25.

The strategies presented here will serve as a roadmap for institutionalizing a proactive, compliant, and sustainable stormwater management philosophy that will guide decision-makers on a pathway of compliance and resiliency. This chapter outlines strategies that would help Santa Fe achieve this vision.

The recommended strategies are grouped in tables based on the following comprehensive recommendations:

- Revise Code of Ordinances (LA)
- Improve Program Management (PM)
- Create Equitable Rate Structure and Ensure Revenue (RE)
- Strengthen Stormwater Requirements for Private Development (PPSM)
- Integrate Innovative Stormwater Management into City Facilities and ROW (PPRW)
- Practice Good Housekeeping and Pollution Prevention on City Facilities (GHPP)

- Map and Manage Stormwater Infrastructure and Assets (ADM)
- Educate Santa Fe Residents and City staff about Stormwater (ET)

Each action recommended to implement these recommends or “strategies” correspond to associated findings detailed in Chapter 3. Each strategy is identified with a unique alphanumeric identifier. For example, strategy PM-2-1, Create an internal stormwater task force, is the first recommended strategy to address the second finding under Program Management (PM-2): **Inadequate communication among departments regarding water-related permit requirements could make the City vulnerable to permit noncompliance and could limit partnerships and cooperation that could be financially beneficial to the City.**

There are instances in which more than one finding is addressed by a single strategy. In these cases, the finding will refer to a previously described strategy to avoid duplication. High-priority recommendations are highlighted and indexed at the end of this chapter.



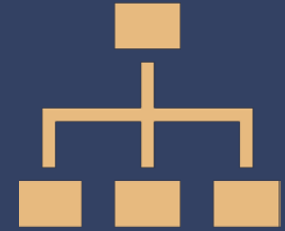


## Revise Code of Ordinances

LA LEGAL AUTHORITY	
LA-1	<b>Overall, the Code contains inadequate active construction best management practices, post-construction stormwater management performance standards, and enforcement authority for stormwater management.</b>
LA-1-1	<p>Revise the Santa Fe Code of Ordinances to include all permit requirement provisions and support, incentivize, and require green infrastructure.</p> <p><i>Santa Fe's existing and proposed MS4 permit requires that the City have adequate legal authority to control stormwater discharges to and from its jurisdiction. Specifically, the permit requires that the City be able to control discharges from active construction projects and new development projects after construction is complete as well as spills, dumping, or illicit discharges of non-stormwater. This Code must also authorize all necessary inspections, surveillance, and monitoring to ensure compliance with the permit. The draft MS4 permit also requires that the City review existing Code to identify and eliminate any impediments to green infrastructure or LID techniques.</i></p> <p><i>The Santa Fe Code of Ordinances regulates land use, water use, infrastructure, and the utilization of fees to pay for stormwater services. Further, the Code must include provisions that authorize the City to require private developments to manage stormwater in a way that protects water quality, conserves water, and limits damage to private property and infrastructure.</i></p> <p><i>Strategies LA-1-2 through LA-1-10 outlines specific revisions.</i></p>
LA-1-2	<p>Require development projects to meet a retention performance standard for post-construction stormwater management.</p> <p><i>The draft MS4 permit requires that this standard be applied to all projects of one acre or larger (Part I.D.5.b.). Applying this standard will support the use of LID techniques on private development projects.</i></p>
LA-1-3	<p>Require new development projects to treat stormwater to remove sediment prior to discharge to the City's storm sewer.</p> <p><i>This requirement is not included in the current draft MS4 permit; however, reducing the discharge of sediment to the storm sewer will improve water quality in the river and will reduce the City's infrastructure maintenance needs (i.e., catch basins and storm sewer pipes). Sediment loading is a combination of land use, topography, and soil type.</i></p>

LA LEGAL AUTHORITY	
LA-1-4	Specify requirements for the long-term operation and maintenance of stormwater management controls on private development projects in the Code of Ordinances.
	<i>The draft MS4 permit requires that the City have procedures for site inspection and enforcement to ensure proper long-term operation, maintenance, and repair of stormwater control measures.</i>
LA-1-5	Require property owners to proactively inspect stormwater management controls to optimize performance.
	<i>City staff indicated that failing stormwater control measures on private property are a significant administrative and maintenance burden. If controls fail, the City's only recourse is to use City staff and equipment to make the necessary repairs and then bill the property owner. This practice has proved to be inefficient and costly.</i>
LA-1-6	Develop administrative penalties available to City staff to enforce stormwater-related code violations.
	<i>Having only civil or criminal monetary penalty options limits the inspection staff's ability to quickly address noncompliance resulting from illicit discharges.</i>
LA-1-7	Revise the Code to include additional enforcement actions to address stormwater management violations during active construction.
	<i>These enforcement actions are typically quite effective during active construction and are integral to a typical enforcement escalation procedure for construction-related stormwater violations.</i>
LA-1-8	Revise the Code to require that large projects phase land disturbance (i.e., grading) to help control dust and surface erosion during rain events.
	<i>The existing Code indicates that phasing may be required on projects at the discretion of the city engineer; however, having a standard phasing requirement ensures that developers will automatically plan a project in this way, rather than having to adjust after submittal of a preliminary plan. During interviews, staff indicated that large, unphased projects have caused considerable dust and runoff issues in the past.</i>
LA-1-9	Revise the Code to include more prescriptive temporary site stabilization requirements.
	<i>The existing Code does not include a timeframe for using temporary stabilization or require that stockpiles be protected daily. During interviews, staff indicated there are significant issues with managing dust and runoff during construction caused by unprotected bare areas and stockpiles.</i>
LA-1-10	Develop ordinance language or policy that describes enforcement escalation procedures for addressing noncompliance recidivism.
	<i>The draft MS4 permit requires that the City have enforcement escalation procedures in place.</i>





## Improve Program Management

PM PROGRAM MANAGEMENT	
PM-1	<b>The City has a diffuse program management structure that assigns significant stormwater program management responsibility to the River, Watershed, and Trails/Stormwater Section within the Engineering Division of the Public Works Department and distributes implementation responsibilities across multiple City departments.</b>
PM-1-1	<p>Establish stormwater management goals and associated levels of service (LOSs) to ensure compliance while protecting water quality, accounting for flood risks, and preparing for the effects of climate change.</p> <p><i>Asset management planning is a popular tool in maintaining LOSs for water and wastewater systems and would be a helpful tool for the City to institutionalize a new stormwater framework. Clear and comprehensive stormwater management goals and associated levels-of-service will also be the foundation for sustainable program budgeting and staffing. (See ADM strategies).</i></p>
PM-1-2	<p>Based on stormwater levels of service, budgets, and staffing, identify departments and divisions most appropriate to meet baseline LOS and reorganize accordingly.</p> <p><i>Primary stormwater permit compliance responsibility is assigned to the River, Watershed, and Trails Section within the Engineering Division of the Public Works Department. Stormwater operations and maintenance responsibility is shared between the Streets and Drainage Maintenance Division of the Public Works Department and the Parks Division of the Parks and Recreation Department. The Land Use Department is assigned primary stormwater program management and compliance responsibility for all private development projects from planning through construction until accepted by the City.</i></p> <p><i>Stormwater management, by nature, impacts and is impacted by the work done by many different municipal departments; therefore, some distribution of responsibility is appropriate and beneficial. Stormwater management implementation responsibilities in Santa Fe were assigned, however, not based on a proactive plan to cost-effectively achieve compliance and meet service obligations, but rather on reactions to drainage issues and resident complaints and a reliance on the status quo to absorb new responsibilities.</i></p>
PM-1-3	<p>As part of the reorganization, evaluate whether key stormwater functions—such as construction inspections—should be consolidated to ensure permit compliance and efficient use of resources.</p> <p><i>While it is critical that compliance requirements are met, the City should eliminate redundancy wherever possible.</i></p>

PM PROGRAM MANAGEMENT	
PM-1-4	<p>Evaluate the current departmental placement of staff responsible for the stormwater program management structure and ensure they are positioned to access City management and other staff responsible for implementation of critical program elements.</p> <p><i>The creation of a strong management structure with clear LOS objectives and staff roles will institutionalize a framework for effective and compliant implementation of Santa Fe’s stormwater management program. Together with elected officials, City management, and the public, stormwater management program leadership—positioned appropriately in the City’s organizational hierarchy— can develop objectives that not only comply with regulations, but also integrate a variety of community benefits and support the objectives of other departments. Because of the diverse nature of stormwater management activities that cross multiple departments, it is critical that managers of those departments buy into and support meeting stormwater management objectives with their own LOS goals, standard operating procedures (SOPs), policies, and budgets. Achieving and maintaining this level of commitment requires City leadership—elected officials, department heads, and staff—to acknowledge the importance of meeting stormwater management objectives.</i></p>
PM-1-5	<p>Create job descriptions for program implementation staff that better define stormwater management roles and align with LOS.</p> <p><i>Staff should be clear as to their role regarding permit compliance and in meeting stormwater services obligations to residents. Having staff without clear roles and responsibilities can impede compliance with federal, state, and local environmental laws.</i></p>
PM-1-6	<p>Evaluate and integrate appropriate One Water planning principles into the City’s wastewater, drinking water, and stormwater programs and Sustainable Santa Fe.</p> <p><i>Applying these principles could help Santa Fe to arrive at better and fiscally-responsible water planning solutions. A One Water planning process would identify projects, programs and policies that will yield sustainable, long-term water supplies for the City and provide greater resiliency to drought conditions and climate change.</i></p>
<b>PM-2</b>	<b>Inadequate communication among departments regarding water-related permit requirements could make the City vulnerable to permit noncompliance and could limit partnerships and cooperation that could be financially beneficial to the City.</b>
PM-2-1	<p>Create an internal stormwater task force.</p> <p><i>City departments responsible for implementing the stormwater program must communicate effectively to ensure that permit requirements are met and to eliminate costly redundancies that can put an undue regulatory burden on residents. A stormwater task force would follow the roadmap outlined in this plan and coordinate long-term permit compliance. The task force will be comprised of staff from—at a minimum—the following departments: Public Works, Land Use, Parks and Recreation, and Public Utilities.</i></p> <p><i>In addition to facilitating communication and ensuring implementation of program elements, the task force could also assist in the development of stormwater management goals, associated LOSs, and assignment of appropriate roles and responsibilities within various departments.</i></p> <p><i>The task force not only could facilitate necessary internal coordination but also could be used during regional collaboration. Consistent</i></p>



PM PROGRAM MANAGEMENT	
	<i>communication between City task force members and Santa Fe County and the New Mexico Department of Transportation will help to facilitate valuable partnerships as well. Sharing of information, data, and lessons learned while implementing new permit requirements will ensure that regional investments provide maximum benefits to the City.</i>
PM-2-2	<p>Develop an internal response tree to quickly address stormwater-related issues identified by the public or in the field.</p> <p><i>After staff roles are more clearly defined, a formal response tree would facilitate timely communication between departments to respond to potential compliance issues in the field. This tree could be used for the Constituent Relationship Manager's Request and Report system.</i></p>
PM-2-3	<p>Update the City's existing Stormwater Management Program (SWMP) planning document to reflect revised objectives, responsibilities, and organizational structure.</p> <p><i>The City will be required to update the existing SWMP to align with new permit requirements once the proposed permit is issued; however, other program changes made as a result of the strategic planning exercise should be incorporated as well.</i></p>

The One Water approach envisions managing all water in an integrated, inclusive, and sustainable manner.



## Create Equitable Rate Structure and Ensure Revenue

RE REVENUE AND EXPENDITURES	
RE-1	<b>The present rate of revenue generation by the Stormwater Utility Service Charge Fee (“utility fee”) is not sufficient to sustain the current scope of the stormwater program, and the scope of stormwater activities will necessarily expand to achieve regulatory compliance and meet other identified needs.</b>
RE-1-1	Use asset management planning to forecast anticipated budget needs to meet stormwater management goals and associated LOSs. <i>See Strategy ADM-1-1.</i>
RE-1-2	Revise utility fee structure and/or rate to ensure not only support of existing programs but also new staffing and capital expenses anticipated to comply with the draft MS4 permit. <i>The City conducted a basic fiscal review, which concluded that the present rate of revenue generation by the Santa Fe utility fee is not sufficient to sustain the current scope of the stormwater program, and the revenue shortfall will widen as the scope of stormwater activities necessarily expands to achieve future regulatory compliance and meet other identified needs (see Chapter 3). While it is possible for the City to supplement the revenue generated by this fee from other sources, having a dedicated and reliable funding mechanism to achieve stormwater levels-of-service, including permit compliance, is the most sustainable funding path.</i>
RE-1-3	Pursue leveraging a portion of the utility fee revenue using capital bonds. <i>The City could leverage the fees in a manner similar to that commonly applied to other City capital projects. The City could leverage \$500,000 of the annual stormwater fee revenues to service bond debt, and, at current market interest rates, produce the capital project capacities shown in Table 2.</i>
RE-1-4	Evaluate other sources of City revenue – such as development impact fees – to determine viability to support stormwater management program elements. <i>Many of Santa Fe’s public stormwater management assets are built during private development projects and then accepted by the City.</i>
RE-1-5	Pursue Clean Water State Revolving Fund (CWSRF) or other alternative funding sources to support qualifying capital projects. <i>The USEPA document Government Funding Opportunities for Stormwater Management in Santa Fe provides many examples of alternative funding sources. For example, the New Mexico Environment Department manages the CWSRF Program, which provides a source of low-cost financing for a wide range of wastewater and stormwater projects that protect surface and ground water.</i>



RE REVENUE AND EXPENDITURES	
RE-1-5	<p>Develop a policy that establishes criteria and priorities for the expenditure of stormwater fee revenues.</p> <p><i>A policy should be adopted that prioritizes the expenditures to be paid primarily from the stormwater utility service charges. Such policies provide the stability required to carry on programmatic activities. This policy will provide the stability required to carry on programmatic activities. Because of their immediate relationship to the stormwater system and the intent of Santa Fe Code of Ordinances Section 13-1, these activities—MS4 compliance, system maintenance and operation, administration and reporting, planning and programming, and enforcement—are most appropriately funded through the service charge. Other significant stormwater program expenditures that can be funded through service charges, including development and permit review fees, and through capital works.</i></p>
RE-2	<p><b>Utility fee rate structure does not provide rate equity among customers, nor does it provide for incentives for beneficial on-site stormwater management practices.</b></p>
RE-2-1	<p>Create nexus between storm sewer system user demand and the rate users pay for the service.</p> <p><i>The City’s present fee structure is based on meter size and is efficient and inexpensive to administer (see Table 2). There is little to no nexus, however, between water meter size and a property’s contribution of runoff volume, rate, or quality that define a property’s “demand” for stormwater services. The best indicator of demand is the presence of impervious cover, and there are various methods for estimating or measuring impervious cover on parcels.</i></p> <p><i>Generally, a rate structure should establish a rational nexus between the services provided and the fee charged, and the rate structure should provide an equitable allocation of costs among customers and customer classes. There are a number of forms of stormwater fee rate structure; however, the more equitable methods are based on a parcel’s impervious cover. This ensures that rate payers pay based on services needed (i.e., management of stormwater runoff created by impervious surfaces on their property). A stormwater fee rate structure levied based on a property’s contribution of stormwater runoff also can incentivize rate payers to reduce the rate or volume of storm runoff or to improve runoff water quality.</i></p> <p><i>Implementation of fiscal policies, rate structure updates, and changes in revenue should be planned jointly. There are a variety of rate structure forms that could improve fee equity and provide the necessary revenue; however, more refined structures require impervious cover data that the City does not currently have. Therefore, data acquisition and management system costs as well as the amount of time necessary must be factored into any restructuring decision (see ADM Strategies). Phasing in rate structure changes over time could be beneficial by allowing gradual increases in the rate payer base and fees and accounting for the time and administrative resources necessary to implement more complex data management systems.</i></p>

RE REVENUE AND EXPENDITURES	
RE-2-2	<p>Revise the rate structure to allow for incentives to reduce the rate or volume of runoff or to improve runoff water quality.</p> <p><i>A variety of rate adjustments and credits have been adopted by jurisdictions as means to implement policies, to recognize differing conditions on properties within similar rate classes, or to incentivize beneficial on-site actions. When adopting credits and rate reductions, the City should establish a cap on the allowable compounded credits so as not to undermine the core support of the stormwater program. Some examples are cited below.</i></p> <ul style="list-style-type: none"> <li>• <i>Low-income/senior fixed income. Typically aligned with similar credits for other City charges.</i></li> <li>• <i>Credits for on-site BMPs. This is used to recognize that more recently developed properties might have robust stormwater controls in place, whereas older properties do not control runoff as effectively.</i></li> <li>• <i>NPDES-permitted properties. This credit recognizes that some industrial, commercial, and agricultural properties are permitted and regulated under the NPDES program and are assumed compliant with their permit obligations to control runoff.</i></li> </ul> <p><i>Alternately, the City could elect to provide incentives that do not impact rates. Such credits currently are offered as one-time rebates to underwrite the costs of installing rain barrels, cisterns, and could be expanded to include rain gardens, bio-cells, and similar beneficial actions.</i></p>
RE-3	<b>Certain activities of the stormwater program are continuous, ongoing functions and are not being reliably funded to meet City requirements or external regulatory obligations, or to ensure properly functioning infrastructure.</b>
RE-3-1	<p>Ensure that essential stormwater management activities are funded via the utility service charge (stormwater fee).</p> <p><i>As noted earlier, the City has occasionally supported selected stormwater projects and activities through other sources beyond the stormwater utility service charge, including the General Fund and outside grants. These are not reliable sources of funding. Activities such as storm sewer system maintenance and operation activities; administration; and reporting, planning, and enforcement activities should be funded through the service charge.</i></p>

**Table 2. Debt Financing Options**

Term	Assumed Annual Interest Rate	Capital Project Capacity <sup>a</sup>
10 years	3.0 %	\$4.98 million
15 years	3.5%	\$7.47 million
20 years	4.0%	\$9.95 million

<sup>a</sup> Assumes annual debt service of \$500,000.



## Rate Structure Forms

### Gross Parcel Area

This structure allocates program costs in proportion to the gross area of a land parcel. The data exist to support such a charge in assessor databases, and the administrative costs would be relatively low. Parcels that are not served by the water utility would need to be added to the billing database. There is an equity trade-off when comparing this gross parcel area approach to the current meter size basis, in that gross parcel area does not reflect the nature of development and impervious area on the parcel; whereas, the presence of a meter and the meter size infer the scale of development on the property, albeit in a coarse manner.

### Factored Gross Area

Some communities apply an approach based on gross parcel area to which a land-use factor (or runoff factor) is applied to approximate the intensity of development on the parcel and, hence, the runoff it generates. This approach was originally developed to approximate an impervious area method (described further below) when aerial imagery and mapping capabilities were much less robust than today's technologies. This approach can improve on equity between customer classes (e.g., among parcels having similar zoning classifications), but does not offer substantial enhancement over the current meter size basis.

### Impervious Surface Area

Using a parcel's impervious area footprint (encompassing rooflines, pavements, and vehicle-traveled gravel surfaces) is the method applied for the most equitable types of rate structures, as it provides a more robust nexus between a land parcel and the volume and rate of runoff. With the availability of high-resolution light detection and ranging (LiDAR) and photo imagery, and GISs for managing parcel data, appropriate charges can be accurately determined for individual parcels.

The nature of impervious area (e.g., parking versus rooftop) and other features (e.g., presence of BMPs) can also be captured to incorporate water quality-based rate factors and rate credits. Often single-family residential properties are grouped into a uniform residential rate or into rate tiers that reflect large distinctions in impervious footprint between residential zoning classifications. Because single-family residential properties comprise most parcels in Santa Fe, this approach can significantly streamline the administrative effort in establishing accounts without compromising equity between highly similar properties.

### Stormwater runoff volume

Creating a standard procedure to determine the amount of runoff generated from a lot as compared to the same location before development is the most equitable and accurate. This method would require the City to develop a runoff volume by lot based on the same values used within the stormwater and water quality models developed from this report. This method takes into account both the size of the parcel and the amount of impervious cover on a lot and can account for approved measures onsite that reduce stormwater runoff.





## Strengthen Stormwater Requirements for Private Development

PPSM PRIVATE PROPERTY STORMWATER MANAGEMENT	
<b>PPSM-1</b>	<b>Adequate erosion and sediment control practices are not consistently required on private developments.</b>
PPSM-1-1	Require standard erosion and sediment control BMP requirements on construction project plan sheets. <i>This strategy will help ensure adequate plans are being submitted to the City for review and that contractors have access to all information on-site to install practices correctly.</i>
PPSM-1-2	Create a standard checklist for review of grading plans. <i>This strategy will support consistent plan review and compliant and effective approved plans.</i>
PPSM-1-3	Require drainage plans detailing stormwater control measures be kept on-site. <i>When plans are not kept on-site, installing the required BMPs can be challenging for contractors and places an additional burden on City inspectors to explain requirements and to track any proposed or approved redline changes in the field.</i>
PPSM-1-4	Institute policies that ensure final stabilization or removal of BMPs at the conclusion of projects. <i>This strategy will reduce erosion caused by inadequate stabilization by the developer after the project is complete.</i>
<b>PPSM-2</b>	<b>The City does not adequately require installation, operation, and maintenance of post-construction stormwater control measures on private development projects.</b>
PPSM-2-1	Require development projects to meet water quality or channel protection performance standards for post-construction stormwater. <i>See Strategies LA-1-2 and LA-1-3.</i>
PPSM-2-2	Adopt design guidance or standards for designers to follow when incorporating stormwater management controls into site plans. <i>An adopted City design manual that can be used by City staff and private designers will ensure that an approved set of design standards are met for all stormwater control measures proposed and built in Santa Fe. Prior to developing a City-specific manual, the City could use an existing manual—such as the New Mexico Department of Transportation Drainage Design Manual (July 2018) which utilizes regional research controls appropriate for optimal performance in Santa Fe.</i>



## PPSM PRIVATE PROPERTY STORMWATER MANAGEMENT

PPSM-2-3	Require preliminary plan review meetings to discuss stormwater management requirements for all regulated projects.
	<i>Stormwater management planning should occur early in the project development process to ensure proper placement and budgeting for installation and maintenance during construction.</i>
PPSM-2-4	Use checklists consistently to review site plans for compliance with post-construction requirements.
	<i>Using checklists that align with adopted, required design standards will ensure that plans are reviewed consistently.</i>
PPSM-2-5	Require applicants to submit operation and maintenance (O&M) plans to address stormwater management controls on development projects after construction is complete.
	<i>Per the City's MS4 permit, all private stormwater management control facilities must be operated and maintained to ensure proper performance. Requiring O&amp;M plans during the drainage plan approval phase ensures that the applicant incorporates maintenance considerations into the design. Further, an approved O&amp;M plan recorded with the deed will transfer to subsequent property owners and ensure long-term performance.</i>
PPSM-2-6	Include stormwater management controls (e.g., infiltration basins, drainage, and retention ponds) and landscaping in warranty inspections for facilities being accepted by the City.
	<i>Warranty inspections are conducted 12 months after project completion to ensure that all infrastructure accepted by the City is operating correctly. Including stormwater management controls and landscaping used to comply with a retention performance standard in these inspections will prevent the City from accepting controls that are incorrectly designed, installed, or stabilized.</i>
PPSM-2-7	Inventory and map newly built, privately owned stormwater management controls.
	<i>A standardized process can be developed as part of permit closeout. The applicant would submit digital storm drain plans with location, elevation, material, size, and so forth in a prescribed format. Digital/cloud technology could be used to collect new system information directly from the contractor or engineer after construction is complete.</i>
PPSM-2-8	Conduct proactive inspections of private facility stormwater control measures or require property owners to self-inspect.
	<i>The City's existing and draft MS4 permit requires that stormwater control measures be installed as designed and maintained correctly to operate as intended to protect water quality. The City can accomplish this by requiring owners to inspect at some approved frequency and then conducting compliance inspections to confirm measures are being maintained correctly (e.g., annual self-inspections and compliance inspections by the City every 3 years).</i>



## Integrate Innovative Stormwater Management into City Facilities & ROW

PPRW PUBLIC PROPERTY AND RIGHT-OF-WAY MANAGEMENT	
PPRW-1	<b>Post-construction stormwater management considerations are not consistently included in planning procedures for new City facilities.</b>
PPRW-1-1	<p>Include stormwater staff in facility planning activities to ensure that adequate erosion control BMPs and post-construction controls are included in the design.</p> <p><i>Post-construction stormwater management considerations must be accounted for early in the facility planning process and throughout any subsequent iterations. Including stormwater staff in all phases of the planning will facilitate this integration. The City's regulatory management software can be used to ensure participation by stormwater management staff in the facilities planning processes.</i></p>
PPRW-1-2	<p>Notify stormwater staff when public facility plans are approved and prior to grading.</p> <p><i>It is critical to inspect projects prior to grading so adequate BMPs can be installed prior to land disturbance.</i></p>
PPRW-1-3	<p>Develop requests for proposals that include erosion and sediment control and post-construction qualification elements to ensure that qualified vendors apply.</p> <p><i>The inclusion of stormwater provisions in the City's facility planning procurement process can prevent the design and installation of inadequate controls on City projects and associated permit noncompliance.</i></p>
PPRW-1-4	<p>Include contractual obligations for installing or maintaining adequate erosion and sediment controls and mechanisms for withholding payments if work is not performed in all construction-related City contracts.</p> <p><i>The City needs to have authority to require contractors to comply with all erosion and sediment control and post-construction requirements and maintain access to the enforcement mechanisms that will elicit compliant behavior.</i></p>
PPRW-1-5	<p>Ensure that budgets for public projects are adequate to fund necessary erosion control and post-construction stormwater management on public projects.</p> <p><i>When initial budget estimates are too low, it is difficult to require additional plan submittals from contracts during the planning phase or to implement alternative controls during construction.</i></p>

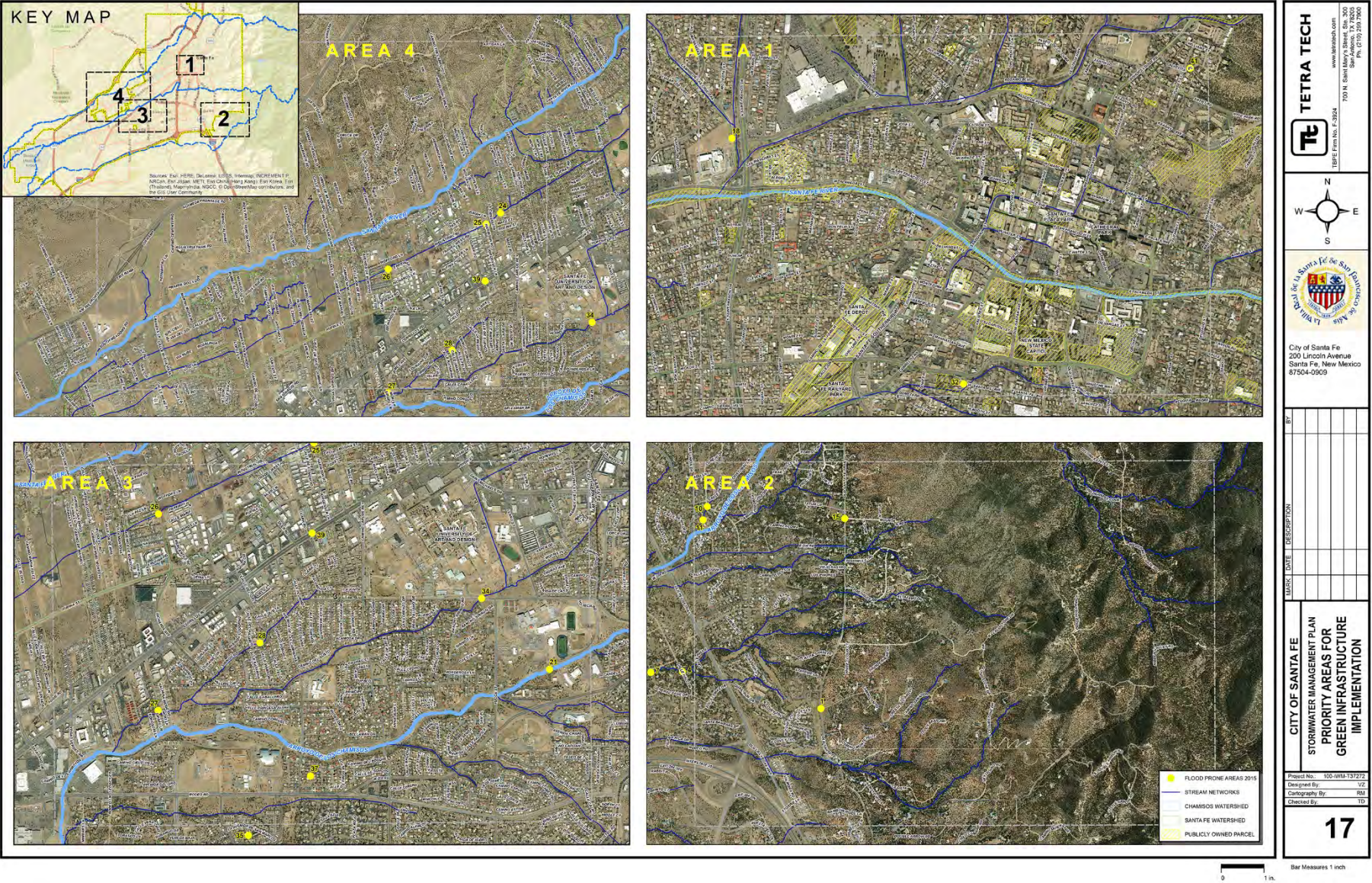
PPRW PUBLIC PROPERTY AND RIGHT-OF-WAY MANAGEMENT	
PPRW-1-6	Adopt specifications or details for designing stormwater management controls in rights-of-way and at City facilities that meet the retention standards required by the draft MS4 permit.
	<i>Practices such as permeable pavement, bioretention, rain gardens, and stormwater landscaping islands can be used to infiltrate water on-site, which can reduce localized flooding and receiving water impacts in the rights-of-way. The USEPA guidebook A Guide to Incorporating Green Infrastructure into Roadway Projects in Santa Fe provides guidance regarding how best to implement this strategy.</i>
PPRW-1-7	Design and install stormwater control measures that meet the new post-construction performance standards at new City facilities.
	<i>All City projects that meet the size threshold established in the draft MS4 permit—activities that result in a land disturbance of greater than or equal to one acre—must include stormwater management controls that meet the performance standards described in Strategy LA-1-2. The standards described in Strategy LA-1-3 will help prevent sediment from entering the storm sewer system and causing flooding and maintenance concerns.</i>
PPRW-1-8	Adopt formal storm sewer infrastructure design criteria that address water quality, stream stability, sediment transport, and stormwater volume management.
	<i>The City's existing standard addresses prevention of localized flooding only during large storm events and does not support the City's infiltration model of stormwater management. Using refined and City-specific drainage system design criteria that address water quality and channel erosion will also prevent unintended negative impacts from infrastructure investments.</i>
<b>PPRW-2</b>	<b>Post-construction stormwater management considerations are not consistently included in capital improvement planning.</b>
PPRW-2-1	Target new stormwater management capital improvement investments based on flood control and water quality modeling and prioritize investment in green infrastructure strategies.
	<p><i>The draft MS4 permit requires that the City incorporate watershed protection elements into relevant planning documents, including capital improvement project plans.</i></p> <p><i>As part of the strategic planning effort, the City conducted flood control and water quality modeling. See the Santa Fe River and Arroyo de Los Chamisos Modeling Report for additional technical details.</i></p> <p><i>Based on this modeling, there are four priority pilot areas for green infrastructure implementation in the City (see Figure 3):</i></p> <ul style="list-style-type: none"> <li><i>• Downtown</i></li> <li><i>• Areas draining to Arroyo Cloudstone and Arroyo Foothill</i></li> <li><i>• Drainage areas in Arroyo de los Chamisos (North Fork)</i></li> <li><i>• Areas along Arroyo de los Pinos</i></li> </ul>



PPRW PUBLIC PROPERTY AND RIGHT-OF-WAY MANAGEMENT	
PPRW-2-2	Using the flood control model, evaluate all existing flood control structures for water quality treatment retrofit potential.
	<i>The draft MS4 permit requires that the City develop a prioritized schedule for retrofitting existing controls to treat runoff in addition to controlling flood waters.</i>
PPRW-2-3	Apply water quality performance standards to all new flood control capital projects.
	<i>The draft MS4 permit requires that the City apply water quality design criteria (see Strategy LA-1-3 for suggested performance standard) in the design of all flood control capital projects. The City is required to assess impacts and incorporate water quality controls into future flood control projects.</i>
PPRW-2-4	Evaluate all flood control capital projects for suitability to control floatables.
	<i>The draft MS4 permit requires that the City have a floatables control program that includes, as necessary, structural control—particularly in industrial and commercial areas.</i>



Figure 3







## Practice Good Housekeeping and Pollution Prevention at City Facilities

<b>GHPP-1</b>	<b>Staff are not conducting good housekeeping practices consistently at City facilities and during City activities.</b>
<b>PPRW-2-1</b>	<p>Develop facility pollution prevention plans to describe the good housekeeping practices being used to control pollution at City facilities.</p> <p><i>The draft permit specifically requires that the City control pollutants at facilities that store equipment, maintain vehicles, and store deicer or other materials that would constitute a potential pollution source. Covering stored materials, performing certain activities indoors, and training staff on spill control and clean up are a few examples of required good housekeeping practices at City facilities. These practices should be documented in a facility-specific plan and certified by the operating City department.</i></p>
<b>PPRW-2-2</b>	<p>Develop SOPs to reduce pollutant discharges during City activities that have the potential to cause pollution.</p> <p><i>The draft MS4 permit requires that the City have procedures to control pollutants from activities such as oils management, hazardous materials storage, snow removal, satellite storage of materials, dewatering of sweeper or catch basin cleaning spoils, construction stockpile management, trash, and recyclables.</i></p>
<b>GHPP-2</b>	<b>The City does not consistently include management of stormwater control measures in facility maintenance budgets and procedures.</b>
<b>PPRW-2-1</b>	<p>Consistently include facilities maintenance staff in facility planning and budgeting activities.</p> <p><i>Stormwater control measures will fail without proper maintenance. Improperly maintained controls can cause water quality impacts and property damage at City facilities. Maintenance requirements must be considered during the design phase to ensure that design elements do not interfere with maintenance and that maintenance can occur safely and with available staff. Further, proper, proactive, and regular maintenance will not occur without adequate funding to ensure proactive maintenance. Including maintenance staff in all phases of planning will help avoid problems associated with future maintenance during design.</i></p>



## Map and Manage Stormwater Infrastructure and Assets

ADM ASSET AND DATA MANAGEMENT	
ADM-1	<b>The City does not currently have a management plan for stormwater infrastructure and assets.</b>
ADM-1-1	<p>Create an asset management plan for stormwater infrastructure and assets.</p> <p><i>A stormwater asset management plan would provide a rational framework for maintaining assets to provide necessary stormwater management services to residents. The planning process would determine the current state of assets (e.g., asset inventory, valuation, condition, and risk) and project long-range asset rehabilitation and replacement requirements. The plan would be driven by the City's stormwater management goals, include appropriate levels of service, and describe the future investments necessary to deliver the committed services. This would be used to refine existing program expenditures and inform rate restructuring and outside funding needs. Currently the City does not have the data necessary to create a stormwater asset management plan (see Finding ADM-2). Strategies ADM-1-2 through ADM-1-5 describe the basic steps necessary to create a stormwater asset management plan.</i></p>
ADM-1-2	<p>Define stormwater management asset classes in Santa Fe.</p> <p><i>There are three types of stormwater management assets: human-made hard assets, natural assets, and human-made soft assets. Hard assets are those traditionally managed by the City—with classes such as the storm drain system and stormwater control measures. Natural assets are what the City generally defines as “green infrastructure”—with classes such as parks and open spaces. Soft assets are harder to define but deal with programmatic assets—with classes such as ordinances and internal policies that support or require stormwater management.</i></p>
ADM-1-3	<p>Develop LOSs for all stormwater asset classes based on adopted stormwater management goals.</p> <p><i>The City would then assign (LOSs to each asset class. These levels-of-service would describe what needs to be done—specific to each asset type—in order to achieve the City's stormwater management goals.</i></p>
ADM-1-4	<p>Inventory all stormwater assets and conduct a condition assessment.</p> <p><i>Each identified asset needs to be evaluated to determine if the associated LOS are being achieved.</i></p>



ADM ASSET AND DATA MANAGEMENT	
ADM-1-5	<p>Determine actions needed to achieve LOS and prioritize those actions based on the risk associated with the failure of the asset.</p> <p><i>The actions necessary to achieve LOSs will be used to forecast revenue needs and assess overall vulnerability. This exercise will help the City evaluate whether the existing organizational structure, budgets, and staff are adequate to conduct the actions necessary to manage the risks associated with the stormwater assets that are not meeting LOSs.</i></p>
ADM-2	<b>The City has inadequate mapping and modeling of public stormwater management assets and the storm sewer system to ensure adequate maintenance and permit compliance.</b>
ADM-2-1	<p>Collect complete stormwater system data, including results of condition assessment of all assets.</p> <p>Complete data includes all street inlets, underground pipes, manholes, roadway culvert crossings, and outfalls. This information is necessary for refined watershed modeling, siting water quality stormwater management controls, determining monitoring locations, building an asset management program, tracking maintenance, and prioritizing projects.</p>
ADM-2-2	<p>Use a GIS-based stormwater data structure to standardize data collection in the City.</p> <p><i>A GIS-based tool is the most beneficial for collecting, developing, and maintaining the stormwater system asset management data. No single system within Santa Fe, however, currently provides the functionality of a GIS interface for data with backend functions for billing, tracking changes, and creating system reports.</i></p>
ADM-2-3	<p>Investigate options for using the asset management tool currently used by the Public Utilities Department for water transmission and distribution assets for stormwater assets.</p> <p><i>Asset management can be performed only with an accurate asset inventory. To effectively manage public assets, you need to know what they are and where they are located. The Public Utilities Department currently uses Cityworks®, a GIS-based asset management tool, for water transmission and distribution assets. This tool could be augmented to support stormwater asset management functions as well.</i></p>
ADM-3	<b>The City does not currently map or track directly connected impervious cover.</b>
ADM-3-1	<p>Develop a detailed impervious cover GIS dataset.</p> <p><i>A detailed impervious cover dataset based on existing LiDAR data and new aerial imagery can be used to better refine the flood control and water quality models and to develop a more equitable stormwater utility fee rate structure (see RE Strategies). In addition, the draft MS4 permit requires that the City begin tracking and reporting directly connected impervious area and impervious area. The permit does not require that the City map impervious cover, but only estimate it; however, mapping changes in impervious cover will allow the City to more precisely predict and manage impacts from increased impervious cover.</i></p>

ADM ASSET AND DATA MANAGEMENT	
ADM-4	<b>The City is not conducting stream flow or targeted water quality monitoring.</b>
ADM-4-1	<p>Develop a monitoring program based on critical water quality areas identified during modeling.</p> <p><i>The proposed MS4 permit requires monitoring for pollutants of concern. Targeting monitoring in high-priority areas can help the City implement pollutant-specific stormwater management activities and gather data that can be used to further refine the existing model. Gathering additional data will increase confidence in model estimates of sediment and nutrient loading.</i></p>
ADM-4-2	<p>Conduct stream flow monitoring.</p> <p><i>Monitoring runoff rate and volume in key watersheds will help verify existing and future watershed-scale modeling and infrastructure design standards. The flood control and water quality models developed during strategic planning are largely uncalibrated because of limited data.</i></p>

**Directly Connected Impervious Area (DCIA)** means the portion of impervious area with a direct hydraulic connection to the storm sewer system or a waterbody via continuous paved surfaces, gutters, pipes, and other impervious features.



## Educate Santa Fe Residents About Stormwater Management

ET EDUCATION AND TRAINING	
ET-1	<b>The City has no formal programs to educate designers, contractors, consultants, or residents on design, installation, and maintenance of private stormwater control measures such as LID practices and erosion and sediment control practices.</b>
ET-1-1	<p>Develop an outreach and education strategy appropriate for target audiences.</p> <p><i>A formal strategy would include appropriate messaging for all target audiences and description of the most effective delivery methods (e.g., web page updates, formal trainings, and industry meeting outreach). The strategy could be informed by resident surveys to insure a need-based program response.</i></p>
ET-1-2	<p>Create a brand for the stormwater program(s) in Santa Fe.</p> <p><i>Creating a logo, message and “voice” for the stormwater management program will improve the City’s ability to disseminate related messaging to residents in a consistent and effective manner.</i></p>
ET-2	<b>The City has no formal programs to train internal staff on the design, installation, and maintenance of stormwater control measures.</b>
ET-2-1-1	<p>Develop a training plan for relevant City staff—designers, plan reviewers, inspectors, and maintenance crews—that ensures staff are qualified to design, inspect, and maintain stormwater control measures, particularly LID practices.</p> <p><i>The draft MS4 permit requires that implementation staff be adequately trained in how to design, review, and inspect practices. Having well-trained staff will ensure that stormwater assets operate as necessary and that private facilities will not cause a future maintenance burden.</i></p>



## High Priority Strategies Index

### Legal Authority

- Revise the Santa Fe Code of Ordinances to include all permit requirement provisions and support, incentivize, and require green infrastructure.
- Require development projects to meet a retention performance standard for post-construction stormwater management.
- Require new development projects to treat stormwater to remove sediment prior to discharge to the City's storm sewer.
- Specify requirements for the long-term operation and maintenance of stormwater management controls on private development projects in the Code of Ordinances.
- Require property owners to proactively inspect stormwater management controls to optimize performance.
- Revise the Code to include additional enforcement actions to address stormwater management violations during active construction.
- Develop ordinance language or policy that describes enforcement escalation procedures for addressing noncompliance recidivism.

### Program Management

- Establish stormwater management goals and associated levels of service (LOSs) to ensure compliance while protecting water quality, accounting for flood risks, and preparing for the effects of climate change.
- Based on stormwater levels of service, budgets, and staffing, identify departments and divisions most appropriate to meet baseline LOS and reorganize accordingly
- Evaluate the current departmental placement of staff responsible for stormwater program management structure and ensure they are positioned to access City management and other staff responsible for implementation of critical program elements.
- Create an internal stormwater task force.
- Develop an internal response tree to quickly address stormwater-related issues identified by the public or in the field.

### Revenue and Expenditures

- Use asset management planning to forecast anticipated budget needs to meet stormwater management goals and associated LOSs.
- Revise utility fee structure and/or rate to ensure not only support of existing programs but also new staffing and capital expenses anticipated to comply with the draft MS4 permit.

- Pursue leveraging a portion of the utility fee revenue using capital bonds.
- Pursue Clean Water State Revolving Fund (CWSRF) or other alternative funding sources to support qualifying capital projects.
- Develop a policy that establishes criteria and priorities for the expenditure of stormwater fee revenues.
- Create nexus between storm sewer system user demand and the rate users pay for the service.

### **Private Property Stormwater Management**

- Require development projects to meet water quality or channel protection performance standards for post-construction stormwater.
- Adopt design guidance or standards for designers to follow when incorporating stormwater management controls into site plans.
- Require applicants to submit operation and maintenance (O&M) plans to address stormwater management controls on development projects after construction is complete.

### **Public Property and Right-of-Way Management**

- Include stormwater staff in facility planning activities to ensure that adequate erosion control BMPs and post-construction controls are included in the design.
- Ensure that budgets for public projects are adequate to fund necessary erosion control and post-construction stormwater management on public projects.
- Adopt specifications or details for designing stormwater management controls in rights-of-way and at City facilities that meet the retention standards required by the draft MS4 permit.
- Design and install stormwater control measures that meet the new post-construction performance standards at new City facilities.
- Adopt formal storm sewer infrastructure design criteria that address water quality, stream and arroyo stability, sediment transport, and stormwater volume management.
- Target new stormwater management capital improvement investments based on flood control and water quality modeling and prioritize investment in green infrastructure strategies.
- Using the flood control model, evaluate all existing flood control structures for water quality treatment retrofit potential.

### **Practice Good Housekeeping and Pollution Prevention at City Facilities**

- Develop facility pollution prevention plans to describe the good housekeeping practices being used to control pollution at City facilities.

### **Asset and Data Management**

- Create an asset management plan for stormwater infrastructure and assets.
- Collect complete stormwater system data, including results of condition assessment of all assets.
- Investigate options for using the asset management tool currently used by the Public Utilities Department for water transmission and distribution assets for stormwater assets.

### **Education and Training**

- Develop a training plan for relevant City staff—designers, plan reviewers, inspectors, and maintenance crews—that ensures staff are qualified to design, inspect, and maintain stormwater control measures, particularly LID practices.