CITY OF VISALIA

Master Plans and Financial Nexus Study

Stormwater Master Plan

August 2026 / FINAL DRAFT

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Abbreviations

ac-ft	acre-feet
BMP	Best Management Practices
cfs	cubic feet per second
CIP	Capital Improvement Projects
City	City of Visalia
CN	Curve Number
CRS	Community Rating System
CWA	Clean Water Act
DDF	depth-duration-frequency
e/o	east of
ESRI	Environmental Systems Research Institute
FCIP	Future Conditions CIP
FHWA	Federal Highway Administration
GIS	geographic information system
gpm	gallons per minute
HEC-RAS	Hydrologic Engineering Center River Analysis System
HGL	hydraulic grade line
HSG	hydrologic soil group
KDWCD	Kaweah Delta Water Conservation District
lf	linear foot
LID	low impact development
LiDAR	light detection and ranging
LS	lump sum
MCM	minimum control measures
MS4	Municipal Separate Storm Sewer System
N/A	not applicable
n/o	north of
NE	northeast
NLCD	National Land Cover Database
No.	number
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NW	northwest
RCP	reinforced concrete pipe
ROW	right-of-way
s/o	south of

SE	southeast
sf	square foot (feet)
SW	southwest
SWMP	Stormwater Master Plan
SWMM	Storm Water Management Model
TID	Tulare Irrigation District
UGB	Urban Growth Boundary
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
w/o	west of
WSS	Web Soil Survey
y^3	cubic yard(s)

EXECUTIVE SUMMARY

The 2026 Stormwater Master Plan (SWMP) represents an update to the hydrologic and hydraulic evaluation of Visalia's stormwater system. This SWMP updates the 1994 SWMP and references applicable sections of the City of Visalia's (City's) 2005 Stormwater Management Program. The primary objective of this update was to determine how the existing stormwater system performs today, identify current deficiencies, evaluate the impacts of future growth, and develop a long-term infrastructure strategy that supports continued development while reducing flooding risks and maintaining regulatory compliance.

The study area has been updated to include the revised growth assumptions from the Visalia 2030 General Plan dated October 2014 and the waterways and basins located outside the current City boundary to the east and west. Additionally, data categorizing the City's stormwater management system has been incorporated into the models to determine existing deficiencies of waterways, basins, and pipes, and to plan for future growth and development.

The City operates and maintains an extensive municipal storm drainage system that includes drainage channels (referred to in this document as major drains), 71 stormwater basins, 51 stormwater pumps at 40 locations, and more than 290 miles of storm drain pipe. The City is defined by eight major drainage basins, including St. John's Basin, Modoc Ditch Basin, Mill Creek Basin, Evans Ditch Basin, Packwood Creek Basin, Cameron Creek Basin, Persian/Watson Basin, and Goshen Drain Basin.

Runoff is either discharged directly to the major drains, discharged from collector pipes, routed to storage basins, or pumped from storage basins or low-lying drainage areas to downstream receiving facilities. Some storage basins are terminal facilities that drain only through percolation, evaporation, or evapotranspiration rather than pumped discharge to a major drain.

ES.1 Existing Conditions and Future Conditions Modeling

The SWMP used two industry-standard computer modeling programs that work together to evaluate the City's drainage system.

ES.1.1 USEPA-SWMM Modeling – Storm Drains, Basins, and Pumps

The United States Environmental Protection Agency (USEPA) Storm Water Management Model (SWMM) was used to evaluate Visalia's internal stormwater infrastructure, including:

- Existing and future runoff.
- Storm drain pipes.
- Pump stations.
- Wet wells.
- Detention and retention basins.

The SWMM model estimates how rainfall becomes runoff and then tracks how water moves through the City's underground infrastructure. It can represent pressurized pipelines, pump operations, flow reversals, and system interactions that commonly occur in flat areas such as Visalia.

ES.1.2 Major Drains and Waterways Modeling

The Hydrologic Engineering Center River Analysis System (HEC-RAS) was used to perform planning-level hydraulic capacity screening for Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek. The Federal Highway Administration (FHWA) Hydraulic Toolbox was used for North Mill Creek and the Persian/Watson Ditches. These evaluations considered channel geometry, roadway crossings, inline structures, backwater, and the onset and extent of channel-bank overtopping.

This waterway modeling was used to determine:

- Planning-level waterway capacity ranges.
- Locations and flow ranges associated with channel-bank overtopping.
- Downstream hydraulic constraints.
- Roadway crossings, inline structures, and other localized hydraulic controls.
- Potential bottlenecks within the receiving channels.

The HEC-RAS analysis is particularly important because many of Visalia's drainage facilities discharge into waterways that also carry irrigation water and regional flood-control flows. During periods when those waterways are already carrying irrigation or flood releases, available capacity for local stormwater runoff is reduced.

Together, these evaluations provide a planning-level understanding of how runoff moves through the City's interior drainage system and how receiving-water constraints affect feasible stormwater-management strategies.

ES.2 Existing Conditions vs. Future Conditions Storm Events

One of the most important distinctions in the SWMP is that Existing Conditions and Future Conditions were analyzed using different storm event assumptions.

This distinction is important because Visalia relies heavily on storage basins and controlled pumping rather than simply conveying water away quickly. Future infrastructure therefore must be designed not only for individual storms but also for repeated storms that occur before facilities have fully drained. This results in a more conservative and realistic planning framework for future growth.

ES.2.1 Existing Conditions Storm Event

The Existing Conditions analysis was performed to determine whether today's infrastructure adequately serves today's community and to identify current deficiencies. The Existing Conditions analysis evaluates whether infrastructure serving the developed City performs generally consistent with the historical design basis under which much of the system was constructed.

The modeling utilizes a storm depth and duration developed by the City that emulates the City's Storm Drainage Design Criteria for Minor Drains. Modeling results were verified with City staff that operate the system.

ES.2.2 Future Conditions Storm Event

The Future Conditions analysis was performed to determine the stormwater infrastructure needed to serve tomorrow's community, specifically for the backbone portions of the future system. The backbone of the City's system includes regional storm trunklines, regional storage basins, and regional storm pump stations. The backbone is generally sized to capture more water to prevent adverse impacts downstream.

The storm depth and duration for the Future Conditions evaluation was developed by the City to follow the City's design standards for the backbone of the system, referred to as "Major Drains" in the City's Drainage Design Criteria. Modeling results were verified using observations from stormwater infrastructure constructed for more recent areas of the City.

ES.3 Existing Conditions Modeling Results and Recommendations

The Existing Conditions analysis concluded that the City's overall drainage system is performing largely as intended. Most major storm drains, basins, and pump facilities provide acceptable drainage service under current development conditions.

However, several localized issues were identified.

Area 1 – South County Center Drive and Walnut Avenue. Flooding occurs due to insufficient wet well capacity and the absence of an overflow route to Evans Ditch. This issue is primarily related to localized storage limitations rather than a major network deficiency.

Area 2 – Houston Avenue and McAuliff Street. Recurring flooding and debris accumulation occur because of a pipe size reduction that promotes clogging and restricts flow.

Area 3 – Kiwanis Park Basin. The basin and wet well system do not fully utilize available storage because of limitations in the hydraulic connection between facilities.

Three Existing Conditions Capital Improvement Projects (CIPs) were developed to address the identified priority areas.

ES.3.1 Recommendations

The SWMP recommends targeted infrastructure improvements to address these identified problem areas, including:

- Wet well modifications.
- Improved overflow connections.
- Localized pipe upgrades.
- Improved basin drainage connections.
- Continued system maintenance and monitoring.

ES.4 Future Conditions Modeling Results and Recommendations

The Future Conditions analysis demonstrates that existing infrastructure alone cannot fully support projected future growth.

The model results identified the need for the following in the areas of projected development:

- Additional regional retention basins.
- New trunk storm drain systems.
- Selected pump and wet-well improvements.
- Controlled outlet connections consistent with receiving-water constraints and applicable agreements.
- Strategic regional drainage improvements.

Thirty-five Future Conditions CIPs (FCIPs) were developed to provide the regional storage, trunk conveyance, controlled outlet, and related infrastructure needed to serve General Plan buildout and known future development areas.

ES.4.1 Recommendations

The SWMP recommends continuation of the City's long-standing "storage-first" drainage philosophy by emphasizing:

- Regional stormwater storage.
- Controlled discharges.
- Retention basins.
- Strategic pump station operations.
- Coordinated implementation with future development.

The study also recommends periodic model updates, development review integration, geographic information system (GIS) tracking, infrastructure condition assessments, and long-term capital improvement programming.

ES.5 Significant Changes Since the 1994 SWMP

Several major changes distinguish the 2026 SWMP from the 1994 master plan.

ES.5.1 Modern Modeling Technology

The 1994 SWMP relied primarily on HEC-1 hydrology and simplified hydraulic methods. The new SWMP uses USEPA-SWMM dynamic wave analysis and HEC-RAS hydraulic modeling, allowing much more realistic representation of storage basins, pumps, backwater effects, and interconnected drainage systems.

ES.5.2 Revised Planning Area

The 1994 Plan evaluated the planning area that was in effect at the time of that plan’s development. This plan is updated to evaluate the planning area included in the 2030 General Plan.

ES.5.3 Updated Data and Rainfall Information

The current models incorporate National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rainfall data, updated GIS and as-built information, City-provided 2006 light detection and ranging (LiDAR), updated pump information, revised basin storage relationships, current General Plan land uses, and updated United States Department of Agriculture (USDA) soil mapping.

ES.5.4 Water Quality and Regulatory Compliance

Since 1994, new regulatory requirements have emerged, including Municipal Separate Storm Sewer System (MS4) permits, National Pollutant Discharge Elimination System (NPDES) requirements, Low Impact Development (LID) requirements, and hydromodification controls. The updated SWMP incorporates these requirements into future planning using the 2005 Stormwater Management Program (an MS4 permit compliance document) as a complement. LID and hydromodification requirements remain applicable to qualifying development and redevelopment projects. However, runoff-reduction, flow-control, and storage benefits attributable to project-specific LID measures were not credited in hydrologic modeling or in sizing the master-planned storm drainpipes and storage basins. This conservative approach avoids relying on measures that may vary by project, timing, implementation, and long-term maintenance.

ES.5.5 Updated Waterway Capacity Evaluation

The updated planning-level waterway capacity ranges are generally lower than the broad ranges reported in the 1994 SWMP for several major drains. The difference primarily reflects the use of detailed cross sections, roadway crossings, inline structures, backwater, and localized hydraulic controls that were not represented in the simplified 1994 Manning's-equation analysis. The updated ranges do not, by themselves, demonstrate that the physical waterways have lost capacity since 1994. Because survey information was unavailable for some crossings, the results remain appropriate for planning-level screening and should be confirmed before designing specific channel or culvert improvements.

ES.5.6 Change in Focus to Stand-Alone Retention Basins

The 1994 SWMP emphasized temporary storage through detention facilities, whereas this plan utilizes retention basins for future development. This approach reduces the City's reliance on downstream conveyance facilities.

Additionally, the 1994 plan recommended multipurpose detention park basins, while this plan provides for standalone retention basins.

In 2025, Parks, Public Works, the City Manager, the Director of Finance, and Engineering agreed to abandon the combination park-basin approach. While basins will still be located adjacent to parks where feasible, consensus was reached that given the City's shift from detention to retention, combination park-basins will not be practical moving forward. All regional basins moving forward will be designed as standalone retention basins.

ES.5.7 From Planning Study to Implementation Tool

The 2026 SWMP provides a detailed roadmap for implementation, including CIPs, planning-level cost estimates, development review guidance, funding support tools, and recommendations for maintaining and updating the City's drainage models.

ES.6 Overall Findings

Visalia's stormwater system is generally serving the community well today, but future growth will require significant investment in regional storage, conveyance, pumping, and drainage infrastructure. The City's greatest challenge is not widespread current flooding, but proactively preparing for future development while managing downstream capacity limitations, aging infrastructure, and evolving regulatory requirements. The 2026 SWMP provides an updated technical and implementation framework for prioritizing capital improvements, coordinating infrastructure with future development, managing downstream discharge constraints, and maintaining the City’s stormwater models and planning tools over time.

CHAPTER 1 INTRODUCTION

1.1 Background

The City is located east of State Highway 99 and along State Highway 198. The City's population is approximately 146,000. The incorporated area covers approximately 41 square miles. Figure 1.1 shows the study area, current municipal boundary, and the Urban Development Boundary Tiers.

1.1.1 2030 General Plan

The City released the Visalia 2030 General Plan in October 2014. The General Plan sets the goals, policies, and implementation tools for the orderly, planned growth of the City. The General Plan also requires public facility master plans to be developed, maintained, and implemented to ensure adequate levels of service for the growth of the City. This document serves as the SWMP for the City.

The General Plan emphasizes increased land use densities and infill development compared with previous growth assumptions, which reduced the planned urban footprint needed to accommodate buildout within the Tier 3 UGB.

The General Plan specifies several policies directly related to stormwater management:

1. Policy P-46 directs the City to continue in an active role in regional and local water management planning. For stormwater, this policy supports the configuration of stormwater facilities that retain and recharge as much stormwater as practical within and near the City, including diversion to off-stream storage basins where feasible. This policy is also important because the City is a member of the Mid-Kaweah Groundwater Sustainability Agency, where stormwater retention and recharge are key components of long-term groundwater sustainability planning.
2. Policy P-57 requires updates to public facility master plans related to infrastructure development to ensure that existing levels of service can be maintained for proposed land uses and development densities.
3. Policy P-61 requires the City to establish a Stormwater Management Program and adopt a Stormwater Management Ordinance to minimize stormwater runoff rates and volumes, control water pollution, meet regulatory requirements, and maximize groundwater recharge. Policy P-61 is implemented through compliance with the City's MS4 General Permit.
4. Policy P-62 requires updating the SWMP to provide site-appropriate solutions that protect surface water quality and meet regulatory requirements as directed by the Stormwater Management Program.

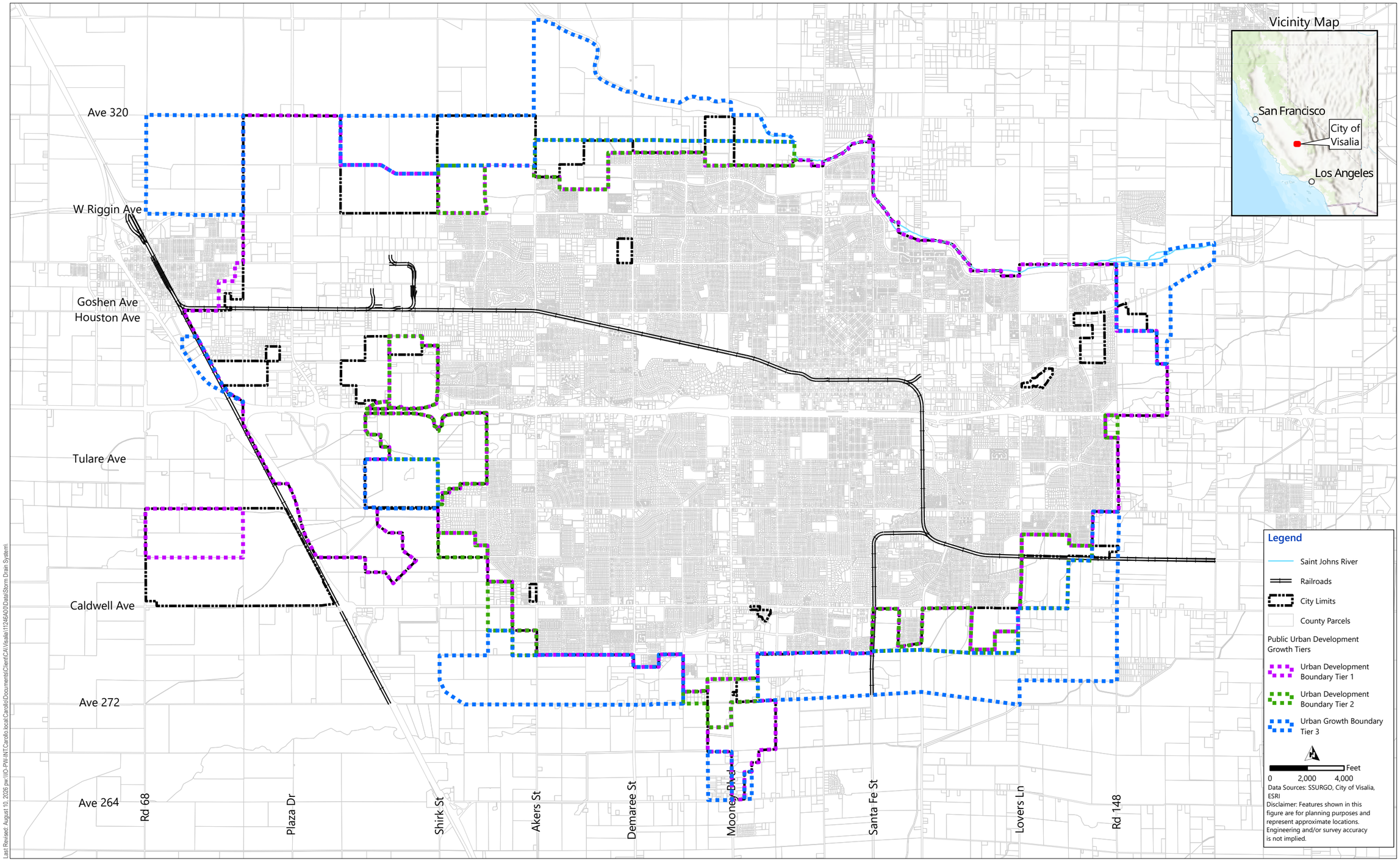

Figure 1.1 Study Area and Urban Boundary Development Tiers
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1.1.2 Federal Emergency Management Agency Community Rating System

The City participates in the Federal Emergency Management Agency Community Rating System (CRS) Program and is committed to improving floodplain management practices to the benefit of the community. The SWMP incorporates CRS Program elements including local drainage protection, stormwater management regulations, and watershed master planning.

1.1.3 Shared Use Waterways

Visalia's stormwater system is shaped by a unique receiving-water constraint: the primary waterways through and around the City function largely as irrigation ditches and managed channels that are often elevated relative to surrounding land and do not provide a natural "downstream outlet" for unlimited storm discharges. Stormwater releases to these waterways are therefore governed by shared-use agreements that limit when and how much the City can discharge, particularly when irrigation deliveries or Lake Kaweah flood control releases occur. As a result, Visalia's stormwater strategy must balance conveyance, storage, controlled pumping/release, and localized surface ponding in a way that is fundamentally different than communities with large natural receiving waters.

1.2 History

The City developed from agricultural land on the lower portion of an alluvial fan formed by the Kaweah River and its distributary channels at the foot of the Sierra Nevada Range along the eastern edge of the valley. Rainfall for the area averages approximately 10 inches per year. The wet season generally includes the months of November through April, though rainfall can occur year-round. January has the highest average monthly rainfall with nearly two inches. Visalia and the surrounding region frequently experience extended periods of drought, especially during the months of June through October.

Historically, stormwater runoff was directed to natural creeks, rivers, and irrigation ditches that flow through the City. The City had to reevaluate their stormwater policies when irrigation companies responsible for the operation and maintenance of the channels refused to accept additional storm runoff from the City, citing their inability to handle the flows downstream as the channels narrow and lose capacity. The City entered into agreements with the private companies that own and operate the ditches that run through the City and the Districts that operate Packwood and Mill Creeks. The agreements establish conditions under which the City can discharge stormwater into the channels and define the City's maintenance responsibilities.

1.2.1 Historic Flooding

Historically, flooding within the City has occurred from two primary sources:

1. Overflow or failure associated with larger waterways and regional flood mechanisms.
2. Localized rainfall events producing nuisance flooding within developed areas.

Localized flooding can occur when rainfall intensity exceeds local collection/conveyance capacity or when downstream receiving systems have reduced capacity due to concurrent irrigation or flood flows. Because the City's topography generally slopes from east to west, overland flow routes also influence where floodwaters collect and how quickly ponded areas can drain.

Floods within and around the City have historically occurred during December, January, and February as a result of heavy rains combined with snow melt from the foothills and the Sierra Nevada Mountains. Major floods occurred in November 1950, December 1955, December 1966, and January 1969. Prior to the construction of the Terminus Dam, the major sources of flooding were the St. John's River and the Kaweah River and its distributaries. Now the major sources of flood waters are the upstream overflows of the St. John's River and the Lower Kaweah, which move toward Visalia as overland sheet flow.

Before the construction of the Terminus Dam, major floods occurred almost every decade and resulted in shallow flooding across thousands of acres of the alluvial fan surface. The December 1955 flood resulted in the largest peak runoff from the Kaweah River watershed with an estimated recurrence interval of approximately 150 years. Both the 1950 and 1955 floods caused shallow flooding of less than three feet in Visalia, but contributed to extensive damage to streets, bridges, structures, and agricultural property. The largest flood since construction of the Terminus Dam occurred in December 1966, when peak flows into Lake Kaweah reached 105,000 cubic feet per second (cfs), the highest ever recorded. All Kaweah River flows were contained by Terminus Dam, and no releases were made from the reservoir during the flood peak. Significant flooding occurred on the alluvial fan primarily from Yokohl Creek. Shallow flooding from local creek systems such as the Yokohl affected about 25 square miles of mainly agricultural land.

Terminus Dam has a capacity of approximately 150,000 acre-feet (ac-ft) and has been operated for flood control by the United States Army Corps of Engineers (USACE) since 1962. The dam has significantly reduced potential flood hazards of Kaweah River and its distributaries. It is estimated that the dam provides protection against floods with a 50-year recurrence interval. Additional flood control measures were proposed by the USACE and Tulare County Flood Control District.

Agricultural land uses and flow regulation at Terminus Dam have resulted in several significant hydrologic and geomorphic changes in the area. First, following dam completion in 1962, the Kaweah River experienced a drastic reduction in high flows. In response, channel capacity downstream of the dam is reported to have declined from about 20,000 cfs in the 1960s to about 10,000 cfs in the late 1990s. Second, unregulated distributary channels and local creek systems downstream of the dam are now important sources of flooding in the greater Visalia area, including Dry Creek and Yokohl Creek. Finally, manmade changes in land use such as land leveling, levees, road berms, and drainage ditches now play a significant role in determining the location and distribution of shallow flooding on the alluvial fan surface.

1.2.2 1994 Stormwater Master Plan

The 1994 SWMP divided the study area into eight drainage basins encompassing 35,000 acres, which corresponded with the 2020 Urban Development Boundary defined in the City's 1991 Land Use Element update to the General Plan. The 1994 SWMP determined the peak discharges to the receiving channels for a design rainfall event and compared those discharges to existing channel capacities. Historic channel flows and water right entitlements were reviewed, and alternatives were developed for managing coincident flows.

This SWMP addresses alternatives to mitigate flooding from local rainfall and builds on the prior SWMP developed in 1994.

1.2.3 2005 Stormwater Management Program

The 2005 Stormwater Management Program outlined the City's stormwater related priorities as part of the City's compliance with the MS4 permit. Six minimum control measures (MCMs) were addressed, including public education and outreach, public involvement and participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management, pollution prevention and good housekeeping.

1.2.4 City's Storm Drainage Design Criteria

The City uses the Rational Method for day-to-day drainage design and development review, while master planning relies on computer modeling approaches more appropriate for large tributary areas and systems with detention and retention storage. Updates to design criteria over time, including changes to conveyance and basin design standards, inform how the City evaluates both existing deficiencies and future system needs. These standards have been incorporated into this study's analysis approach.

1.3 Purpose

This update to the City's SWMP presents data, modeling, and analysis results for the City's stormwater basins, pumps, pipe network, and waterways for existing and planned future conditions. The study area was updated to the Tier 3 UGB plus the waterways and basins located outside the boundary to the east and west. Existing and new data were incorporated into the models to determine the existing deficiencies of waterways, basins, and pipes. Additionally, the models can be updated in the future to predict changes during the estimated 10- to 20-year planning horizon of this SWMP.

In addition to evaluating existing and future storm system performance, the updated SWMP is intended to:

1. Provide clear direction for development by identifying tributary areas, recommended pipe sizes/depths, potential basin locations, and basin capacities.
2. Define design criteria and accepted calculation methods.
3. Establish a defensible basis for updating storm funding mechanisms by outlining capital improvements with transparent cost estimating methodology and clear definitions of included versus excluded costs.

This updated SWMP will also support updates to storm service charges by identifying improvements needed to address existing deficiencies, and by including generalized program needs related to MS4 compliance where appropriate. The plan further documents considerations for waterway conveyance and regional flood control coordination, recognizing that receiving capacity limitations and shared-use agreements are central to feasible system solutions.

1.3.1 Objectives

Consistent with prior master planning, the City recognizes that some degree of moderate street ponding may occur as the urban area continues to develop, and that eliminating street flooding solely through conveyance upsizing is often impractical and cost prohibitive. Accordingly, this SWMP emphasizes an integrated strategy that combines:

1. On-site and regional storage.
2. Pump station discharge management consistent with operational agreements and downstream capacity constraints.
3. Targeted conveyance improvements where they provide measurable, systemwide benefit.

Storage facility sizing also requires careful consideration of outlet limitations. Facilities that rely primarily on infiltration and evapotranspiration (i.e., without an engineered outlet) require different sizing and performance assumptions than detention basins with controlled discharge. In addition, prior master planning has applied different design storm criteria for downstream terminal facilities compared with in-town basins. This SWMP update carries forward that framework and documents its application to support storage strategies that align with City standards, outlet constraints, and system performance objectives.

1.4 Report Organization

The SWMP report has been organized to help readers easily find important information. Table 1.1 provides an overview of each chapter in this SWMP.

Table 1.1 Report Organization with Descriptions

Chapter	Description
1. Introduction	Provides background and history related to the SWMP update, including a summary of previous studies.
2. Existing Conditions	Provides an overview of the City's stormwater system.
3. Basis of Design	Describes the general approach, assumptions, and software needed to conduct the SWMP update.
4. Hydrologic Analysis	Describes the hydrologic model and analysis, including subcatchment delineation to runoff calculations.
5. Hydraulic Analysis of Waterways	Describes the hydraulic models and analysis of the drainage ditches and channels.
6. Hydraulic Analysis of Basins, Pumps, and Pipe Network	Describes the hydraulic models and analysis related to the basins, pumps, and pipe network for both the existing and future buildout conditions.
7. Stormwater Management Alternatives	Evaluates the alternatives considered for future conditions, including level of protection and stormwater storage.
8. Proposed Improvements	Provides a discussion of the proposed projects to address future buildout, with planning-level cost estimates and implementation considerations.
9. Water Quality Measures	Briefly discusses measures to improve the quality of stormwater discharges.
10. Design Criteria for Master Plan Implementation	Includes design criteria for and methodology for infrastructure upgrades performed by the City and for new development.
11. Recommendations for Future Studies	Provides recommendations for future studies based on the outcomes from this plan.

CHAPTER 2 EXISTING CONDITIONS

This chapter summarizes the existing storm drainage system serving the City, including overall system configuration, primary drainage basins, storage basins, pump stations, and the shared-use major drains that receive City stormwater. The existing system reflects a combination of underground conveyance facilities intended to collect and route frequent storm runoff, distributed storage used to manage runoff when downstream receiving capacity is limited, and pumping facilities required where gravity discharge is constrained by flat topography and tailwater conditions.

The City operates and maintains a vast municipal storm drainage system that consists of drainage channels, 71 stormwater basins, 51 pumps at 40 pump stations, and more than 290 miles of pipe. Historically, runoff was directed to natural creeks, rivers, and irrigation ditches, including St. John's River, Mill Creek, Packwood Creek, Modoc Ditch, Evans Ditch, and Persian Ditch.

The City has purchased land and constructed permanent retention basins, including park-pond basins, to mitigate the increased runoff due to urbanization. A defining characteristic of Visalia's drainage system is its reliance on major drains that also convey irrigation flows and, at times, regional flood releases. As a result, available receiving capacity for stormwater varies seasonally and operationally, and stormwater management relies on a coupled network of conveyance, storage, and controlled discharge rather than conveyance expansion alone.

2.1 Drainage System Overview

The City operates and maintains a municipal storm drainage system consisting of open-channel major drains, stormwater storage basins, pump stations, and an underground storm drain pipe network. The system is organized into eight major drainage basins that generally drain from east to west toward downstream receiving facilities and shared-use waterways.

The City's minor drainage system collects and conveys runoff to the major drains and consists primarily of catch basins and underground concrete pipes.

2.1.1 System Function and Design Characteristics

The existing storm drainage system is intended to reduce the frequency and extent of nuisance flooding from relatively frequent storms by collecting runoff, temporarily storing excess flow where downstream conveyance is constrained, and discharging stormwater to major drains under controlled conditions. Key characteristics of the system include:

- Minor (collector) conveyance: Catch basins and underground pipes collect runoff and route flow toward major drains and storage basins.
- Storage-first behavior during higher intensities: When rainfall intensity exceeds available pipe capacity, water may pond within streets and other low areas until pipe capacity becomes available and/or ponded water migrates along overland flow paths. This behavior effectively moderates peak inflows to storage basins and downstream waterways.

- Reliance on controlled discharge: Where major drains are capacity-limited or shared with irrigation/flood conveyance, stormwater discharges are managed using pump station operations, outlet controls, and storage drawdown.
- Dual drainage (surface + subsurface): During larger events, portions of the system may surcharge and route flow along streets and within the public right-of-way (ROW) before returning to the storm drain system or reaching downstream collection points.

2.1.1.1 Major Drainage System

The major drainage system consists primarily of open channels and shared-use ditches/canals that receive stormwater discharges. These facilities are integral to routing runoff across the City and ultimately toward downstream outlets. Because major drains may concurrently convey irrigation deliveries and/or flood releases, the available capacity for stormwater can vary over time, and discharges must remain consistent with allowable flow conditions.

Many of the major drains in the City are jointly used to convey flood water, irrigation water, and stormwater. During the winter months, flood control releases from Kaweah Lake make use of the major drains to convey flood water through the City. The channels and ditches are also used to convey entitled irrigation flows as shown in Table 2.1. The maximum historic flow from 2000 to 2019 provided by Kaweah Delta Water Conservation District (KDWCD) is also shown in Table 2.1**.** When either irrigation or flood flows are conveyed in the major drains, the capacity for stormwater runoff from the City is reduced. Agreements between the City and irrigation companies allow the City to improve the conveyance capacity of the channels and ditches or provide equivalent storage and make use of the increased capacity for stormwater conveyance. Agreement provisions by facility are summarized in Appendix A.

Table 2.1 Maximum Winter Entitlement

Channel	Maximum Winter Entitlement (cfs)	Maximum Historic Flow (2000-2019) (cfs)
Packwood Creek	265	300
Mill Creek	99	169
Evans Ditch	54	50
Modoc Ditch	99	86

2.1.1.2 Minor Drainage System

The minor drainage system includes storm drain inlets, underground pipes, manholes, and appurtenances that collect runoff from streets and developed areas. The minor system conveys runoff to the major system and to storage basins. Localized surcharging and street ponding may occur when inflows exceed inlet/pipe capacity, when downstream water levels create backwater conditions, or when discharge constraints limit basin drawdown.

2.2 Current Drainage Concerns

The regional and historic flooding described in Section 1.2.1 relates primarily to runoff from the Kaweah River Basin. Current drainage challenges generally fall into two categories:

1. System constraints.
2. Localized deficiencies.

The concerns are described more fully below.

2.2.1 System Constraints (Capacity and Operational Limitations)

Major flooding is rare in Visalia because the City is relatively flat and ponding does not concentrate in significant, damaging depths. There are several minor or nuisance flooding areas caused by local runoff concentrations. The nuisance flooding will become more frequent if development continues without improving the system. Key system planning considerations include:

1. Variable downstream receiving capacity: Major drains that receive City stormwater are often shared with irrigation conveyance and, at times, regional flood routing. When these flows are present, the available capacity for local stormwater discharge is reduced.
2. Need for controlled discharge and staged drawdown: Because allowable stormwater discharge rates can be constrained, storage basins and pump station operations play a central role in preventing excessive downstream loading while managing localized ponding durations.
3. Flat topography and backwater sensitivity: Low relief and tailwater effects can reduce hydraulic gradients, increase sensitivity to downstream water levels, and increase the likelihood of localized ponding during higher intensity events.

2.2.2 Localized Deficiencies (Collection and Conveyance)

Localized deficiencies in the collection and conveyance system can drive nuisance flooding even where the major drainage backbone generally performs as intended. These issues are typically concentrated at discrete segments or appurtenances (e.g., inlets, crossings, transitions) and are influenced by a combination of physical capacity, hydraulic control (tailwater and limited grade), and maintenance condition. The most common localized deficiency types observed are:

1. Undersized or shallow collection/conveyance segments relative to contributing imperviousness and local inlet spacing.
2. Localized bottlenecks at inlets, crossings, or transitions between systems.
3. Sediment, vegetation, and debris accumulation in channels and at inlet structures that reduce effective capacity.

Localized flooding is therefore not solely a function of pipe size. It may also reflect inlet interception limits, localized bottlenecks, maintenance-related reductions in capacity, and the operational constraints of a storage-and-controlled-discharge system where drawdown is governed by downstream receiving conditions.

The objective of this SWMP is to identify and prioritize improvements that reduce recurring, materially disruptive flooding and improve system performance at the neighborhood and basin scale, including deficiencies that propagate from constraints in the major drainage system. Elimination of isolated, short-duration street ponding at individual inlets or low points is not the intent of this SWMP and is more appropriately addressed through targeted maintenance, inlet modifications, or localized spot improvements.

2.3 Major Drainage Basins

The 1994 SWMP defined eight major drainage basins, including St. John's Basin, Modoc Ditch Basin, Mill Creek Basin, Evans Ditch Basin, Packwood Creek Basin, Cameron Creek Basin, Persian/Watson Basin, and Goshen Drain Basin. The drainage basin figure from the 1994 SWMP is shown in Figure 2.1. Basin delineations reflect existing topography, the configuration of major drains and collector systems, and the locations of storage basins and pump stations. Runoff from each basin is conveyed via a combination of underground storm drain infrastructure and open-channel facilities and is either discharged directly to a major drain, routed into storage for later release, or pumped to a major drain where gravity discharge is not feasible. The historical perspective of the eight major drainage basins is provided in the following subsections.

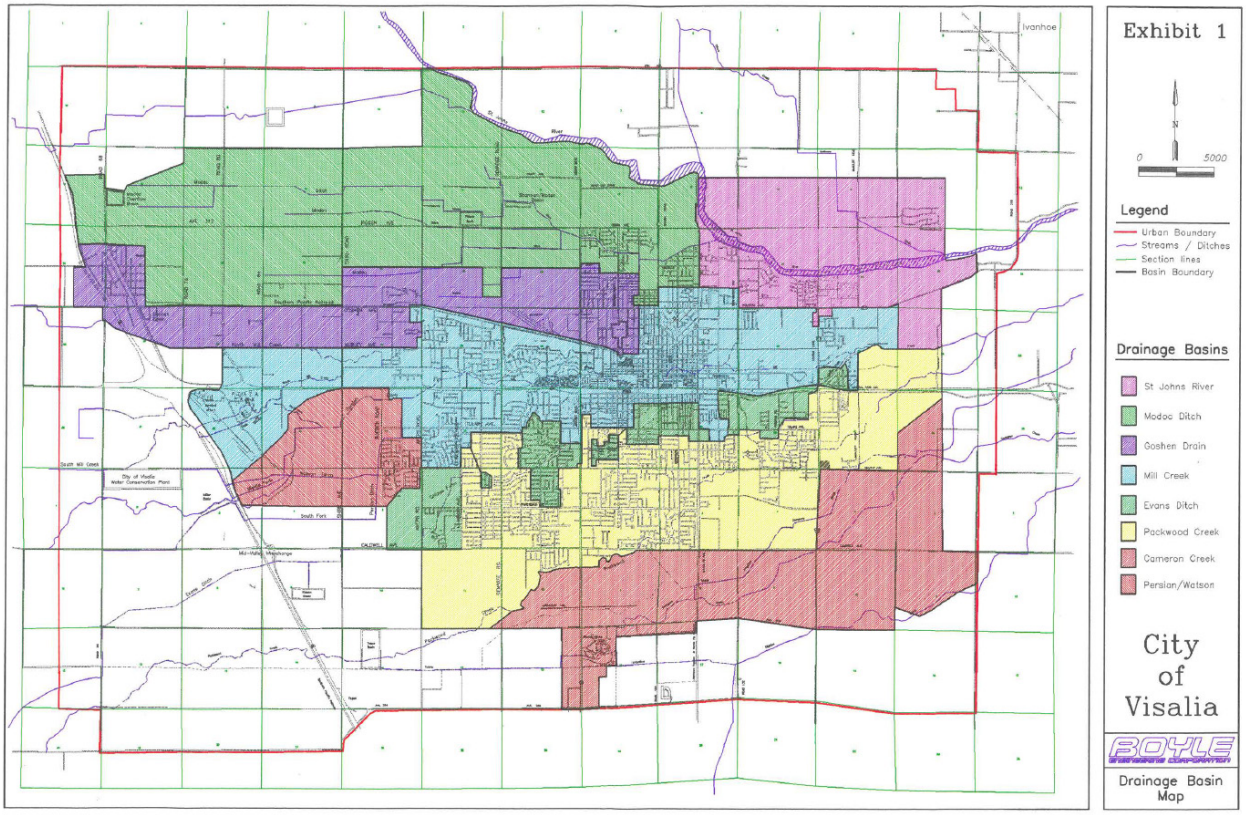

Figure 2.1 Exhibit 1 from the 1994 SWMP - Major Drainage Basins

2.3.1 St. John's Drainage Basin

The St. John's Drainage Basin is approximately 3,393 acres and is located in the northeast portion of the City. The area is partially developed and planned for increased residential and commercial development. The 1994 SWMP determined approximately 2.3 square miles of the basin area drain to the St. John's River. The elevation of the riverbank is higher than adjacent land elevations and runoff drains to the river via four pump stations (five total pumps) located along the riverbank.

St. John's River is regulated by the Kaweah and St. John's Rivers Associations. The river begins at McKays Point about 12 miles east of Visalia and joins Cottonwood Creek about three miles west of Road 80. Cottonwood Creek continues to Tulare Lake. St John's River has a capacity ranging from about 8,000 to 11,000 cfs (per Central Valley Flood Protection Board) in the vicinity of Visalia and is currently maintained by the KDWCD.

2.3.2 Modoc Ditch Drainage Basin

The Modoc Drainage Basin is approximately 8,242 acres and is located in the northern portion of the City along both sides of Modoc Ditch. The area is partially developed, and runoff is pumped to the ditch via six pumps. The 1994 SWMP determined approximately one square mile of the developed area drained to Modoc Ditch.

Modoc Ditch is an open channel irrigation canal that provides irrigation service to about 6,500 acres. The channel begins at the St. John's River about one-quarter mile west of Ben Maddox Way and ends west of the City at Road 68 in a terminal basin. The upstream flow at the headgate is controlled by the Modoc Ditch Company. The channel splits several times and the capacity of the main channel decreases in the downstream direction.

2.3.3 Mill Creek Drainage Basin

The Mill Creek Drainage Basin is approximately 6,149 acres and is nearly fully developed. The drainage area includes the downtown and other commercial, industrial, and residential areas along both sides of Highway 198. Runoff drains to Mill Creek by gravity drains and pump station discharges.

Mill Creek is a combination of lined, unlined, natural, and closed conduit conveyance systems. Mill Creek begins at a split of the Lower Kaweah River near Road 158, flows through the City, and continues to Cross Creek in Kings County. A north branch splits from the main channel near Tommy Road and continues to Cross Creek.

Irrigation and flood flow at the headwaters are regulated by Kaweah and St. John's Rivers Associations. There is no direct irrigation service from the channel, however, it delivers water to the Evans Ditch headgate on the east side of the City and the Persian/Watson Ditch system headgate near Linwood.

2.3.4 Evans Ditch Drainage Basin

The Evans Ditch Drainage Basin is approximately 1,614 acres and consists of several isolated areas surrounded by the Packwood Creek and Mill Creek Drainage Basins. The basin is mostly fully developed and drains to Evans Ditch by pump stations.

Evans Ditch is an open irrigation canal that begins at Mill Creek near McAuliff Road and flows to Nelson Pit, then beyond to Mill Creek near the County line.

Irrigation and flood flow at the headworks are regulated by the Evans Ditch Company. Both the City and the Evans Ditch Company have a 50 percent share of the channel, and the City maintains the channel within the City limits.

2.3.5 Packwood Creek Drainage Basin

The Packwood Creek Drainage Basin is approximately 5,880 acres and drains the southern part of the City. Most of the drainage area is developed with some areas under development. The 1994 SWMP determined approximately 5.3 square miles of land drain to Packwood Creek. Areas on the eastern side of the City drain to Packwood Creek by gravity, and areas on the western side drain by pump stations.

Packwood Creek is an unlined natural channel that begins at the split of the Lower Kaweah River near Road 158, flows through Tagus Basin, and continues to the southwest.

Developed areas surround the channel as it passes through the City. At the headworks, flows are regulated by the Tulare Irrigation District (TID), while the City maintains the channel within the City limits.

2.3.6 Cameron Creek Drainage Basin

The Cameron Creek Drainage Basin is approximately 4,781 acres and is located in the southern portion of the City. Most of the Cameron Creek watershed is undeveloped, although significant development is planned in the Visalia 2030 General Plan.

Cameron Creek is an open channel natural stream that historically began at Deep Creek north of Farmersville. The current origin, however, is at TID's main canal east of Road 156. The Creek connects back with TID's main canal on the east side of Mooney's Grove.

Irrigation and flood flow are regulated by TID, which also maintains the channel. Occasionally, water is diverted from the main canal to Cameron Creek for groundwater recharge when excess water is available.

2.3.7 Persian/Watson Drainage Basin

The Persian/Watson Drainage Basin is approximately 1,626 acres and located on the western side of the City south of Highway 198. The Persian/Watson Ditch is an open irrigation canal owned by the Persian Ditch Company and the Watson Ditch Company.

Persian/Watson Ditch starts at Mill Creek near Linwood Street. The North Fork of Persian Ditch crosses Highway 99 and terminates. The Middle and South Forks of Persian/Watson Ditch flow by Miller Basin and connect with Mill Creek or terminate.

2.3.8 Goshen Drainage Basin

The Goshen Drain Drainage Basin is approximately 3,243 acres and follows Goshen Avenue in the northwestern part of the City. Goshen Drain is a 48-inch reinforced concrete pipe (RCP) that starts on Goshen Avenue near Mooney Boulevard and empties into a large basin ("Goshen Ocean") on the western side of the City.

The Goshen Ocean also has pumped discharge to the North Fork of Mill Creek, also referred to as Mill Creek Ditch, which provides a downstream outlet for stored runoff when pumping is required.

2.4 Storage Basins

Stormwater storage basins are one part of the City's municipal storm drainage system. Currently, there are 71 stormwater storage basins ranging in size from 0.2 to 394 ac-ft capacity and a total storage volume of 2,898 ac-ft throughout the system. The footprint of the storage basins range in size from 0.1 to 34 acres, with a total coverage area of 353 acres.

Storage basins provide volume to manage excess runoff during periods when minor-system conveyance capacity is exceeded, when downstream receiving capacity is reduced due to irrigation or flood operations, or when discharge must be controlled to remain consistent with allowable conditions in shared-use major drains. They also provide operational flexibility by enabling staged drawdown and timed pumping or discharge as downstream conditions allow.

Basin performance is therefore closely tied to pump station operations, tailwater conditions, and the practical limits on discharge to major drains. Table 2.2 provides a summary of the existing storage basin locations, capacities, and footprints. Figure 2.2 shows the locations of the storage basins.

Table 2.2 Existing Storage Facilities

Name	Type of Basin	Location	Capacity (ac-ft)	Footprint (acre)
American Industrial Park East Basin	Retention	e/o American Street s/o Grove Avenue (NW)	7.8	0.87
American Industrial Park West Basin	Retention	10529 W Legacy Avenue	9.7	1.06
Auto Mall Basin	Retention	Century Street & Hillsdale Avenue (SW)	16.9	1.65
Avenue 280/Road 48 (NW)	Retention	Avenue 280 & Road 48 (NW)	277.3	32.66
Blain Park/Pond	Detention	S Court Street & Parkview Avenue	7.9	1.93
Brelsford Basin	Temporary	Plaza Drive (800' East)	33.4	2.48
Briarwood Basin	Retention	Seeger Avenue & Beech Drive	5.4	0.8
Burke Park/Pond	Retention	S Burke Street & E Monte Vista Avenue (SW)	27	4.2
C.O.S. Basin	Detention and layoff recharge	Mary Avenue & Crenshaw Street (NW)	20.3	2.02
Cherry Meadow Park/Pond	Detention	S Pinkham Street & Cherry Avenue	14.9	3.52
Combs Park/Pond	Detention	S Crenshaw Street & La Vida Avenue	36.4	6.27
Constitution Park/Pond	Detention	W Tulare Avenue & S Crenshaw Street	6.2	1.33

Name	Type of Basin	Location	Capacity (ac-ft)	Footprint (acre)
Creekside Basin	Detention and layoff recharge	McAuliff Street s/o Mill Creek (E)	89.7	6.59
Doe Avenue	Retention	Doe Avenue e/o Kelsey Street (S)	5.7	0.68
East Oaks Est. Basin	Retention	Comstock Street s/o Race Avenue (SE)	5.9	0.65
Emerald Park Subd. Basin	Temporary	O'Malley Street & Douglas Avenue (NW)	0.2	0.07
Fairview Village Park/Pond	Detention	N Conyer Street & W Wren Drive	17	3.77
Ferne St. Basin	Retention	Ferne Street s/o Roosevelt Avenue (NW)	10.9	1.35
Foxwood Estates Basin	Retention	W Ferguson Avenue & N Roeben Street (SE)	27.5	2.78
Goshen Basin	Detention	W Goshen Avenue & Camp Drive (SE)	167.7	11.7
Hillsdale Basin	Temporary	Hillsdale/Marcin	5.4	0.68
Hillsdale/Kelsey	Retention	Hillsdale Court e/o Kelsey Street	7.8	0.5
Island Oak Basin	Detention	N St Johns Parkway & E Lark Avenue	1.9	0.79
Kelsey Street	Retention	N Kelsey Street s/o Roosevelt Avenue	0.9	0.19
Kiwanis Park Basin	Detention and layoff recharge	McAuliff Street & Tulare Avenue (SW)	6.4	0.92
Linwood Ranch Basin	Detention	Visalia Parkway & S Chinowth Street (NW)	38.1	2.27
McDermott Basin	Retention	W Mineral King Avenue & S Linwood Avenue	30.6	3.99
Mid State 99 VF Basin	Retention	Road 76 n/o Ferguson Avenue (NW)	12.4	1.33
Mill Creek Garden Park/Pond	Detention	Lovers Lane & Mill Creek Parkway (SE)	16.9	4.59
Modoc Basin	Retention and layoff recharge	W Riggin Avenue & N Linwood Street	100	16.07
Mooney Boulevard Basin	Detention	S Mooney Boulevard & W Cameron Avenue	11.2	1.26
Nevada Street	Detention	Nevada Street s/o Placer Avenue	6.9	0.92
Oakes Basin	Detention and layoff recharge	E Mineral King Avenue & Road 152 (NW)	61.2	8.55
Oakwest Basin	Detention	Preston/ Logan	3.4	0.66
Oakwest No. 1 Subd. Basin	Detention	N Cottonwood Street & Damsen Avenue (SE)	1.8	0.78
Pappas Park/Pond	Detention	Mineral King Avenue & Chinowth Street (NW)	2.7	0.78
Park Place Basin	Retention and layoff recharge	S Pinkham Street & Victor Avenue	34.6	3.3
Piano Basin	Retention	Roeben/Goshen	70.2	6.55
Pickett Basin	Retention	9755 W Legacy Avenue	6.7	0.72
Pinkham Park/Pond	Detention	S Pinkham Street & Tulare Avenue (NE)	3.3	0.83
Plaza Drive	Detention	Plaza Drive s/o Nicholas Avenue	0.81	0.6
Police Station Basin	Retention and layoff recharge	W Cameron Avenue & Woodland Street (SW)	126	12.51
Ridgeview Middle School	Temporary	Sedona Avenue w/o Road 100	11.8	1.8
Ritchie Industrial Basin	Retention	N Kelsey Street & W Ferguson Avenue (NE)	20.8	1.89
River Run Ranch Basin	Retention[1]	St Johns Parkway & Madera Street	7.7	0.64

Name	Type of Basin	Location	Capacity (ac-ft)	Footprint (acre)
River Run Ranch Basin (East)	Retention	St. Johns Parkway & Road 148 (NE)	15.0	1.38
Riverbend Village Park/Pond	Detention	N Court Street & E Wren Avenue	12	1.95
Road 44/Avenue 280 (NE)	Retention and layoff recharge	Road 44 & Avenue 280 (NE)	393.6	34.05
Road 44/Hume Ave (SE)	Retention and layoff recharge	Road 44 & Hume Avenue (SE)	186.7	33.99
Road 48/Hume Ave (SW)	Retention and layoff recharge	Road 48 & Hume Avenue (SW)	313.1	32.23
Ruiz Park/Pond	Detention	N Burke Street & Buena Vista Avenue	16.4	5.53
Savannah Foods Basin	Detention and layoff recharge	N Kelsey Street & W Ferguson Avenue (SW)	65.4	10.45
Savannah Heights Basin	Retention and layoff recharge	W Walnut Avenue w/o S Roeben Street	28.6	4.04
Scenic Corridor NE Basin	Retention	Highway 198 & Shirk Road (NE)	10.7	4.58
Sequoia Heights Subd. Basin	Temporary	Virmargo Street & Oak Avenue (SE)	4.3	0.52
Seven Oaks Park/Pond	Detention	S Edison Street & Tulare Avenue	19.9	3.79
Shannon/Modoc Basin	Detention and layoff recharge	Shannon Parkway & N Demaree Street (SE)	117.6	15.5
Shirk Industrial Park Basin	Retention	Pershing Street w/o Shirk Street (NW)	5.0	0.65
Sierra Village Basin	Detention	Molenstraat s/o State Route 198	33.6	2.91
Soroptimist Basin	Retention	N Tipton Street n/o Race Avenue	34.5	4.36
South Cameron Creek Basin	Retention	W Cameron Avenue & West Street	33.8	3.24
St. Charles Place Subd. Basin	Temporary	Dunsworth Street s/o Houston (S)	0.8	0.22
Stonebridge Subd. Basin	Temporary	Cedar Street & Princeton Avenue (E)	0.9	0.31
Stonebridge Subd. Basin	Retention	Cedar Street & Walnut Avenue (NE)	2.0	1.01
Stonebrook Park/Pond	Detention	Martin Street & Hemlock Avenue	45.8	8.93
Sunset Park/Pond	Retention	S Roeben Street & W Lisendra Drive	42.5	5.14
The Ranch Basin	Retention	Linwood Street & Houston Avenue (SE)	81.8	6.28
U.S. Towers Basin	Retention	Marcin Street & Paradise Avenue (SW)	2.9	0.51
VECC	Temporary	School/Murray	14.0	3.32
Webb Estate Basin	Detention	W Manor Court & W Crowley Court	0.5	0.3
Willow Glen Park/Pond	Detention	Akers Street & Hurley Avenue (SE)	6.0	2.13

Notes:
e/o - east of; n/o - north of; No. - number; s/o - south of; w/o - west of; NE - northeast; NW - northwest; SE - southeast; SW - southwest.
(1) Sized as Detention Basin.

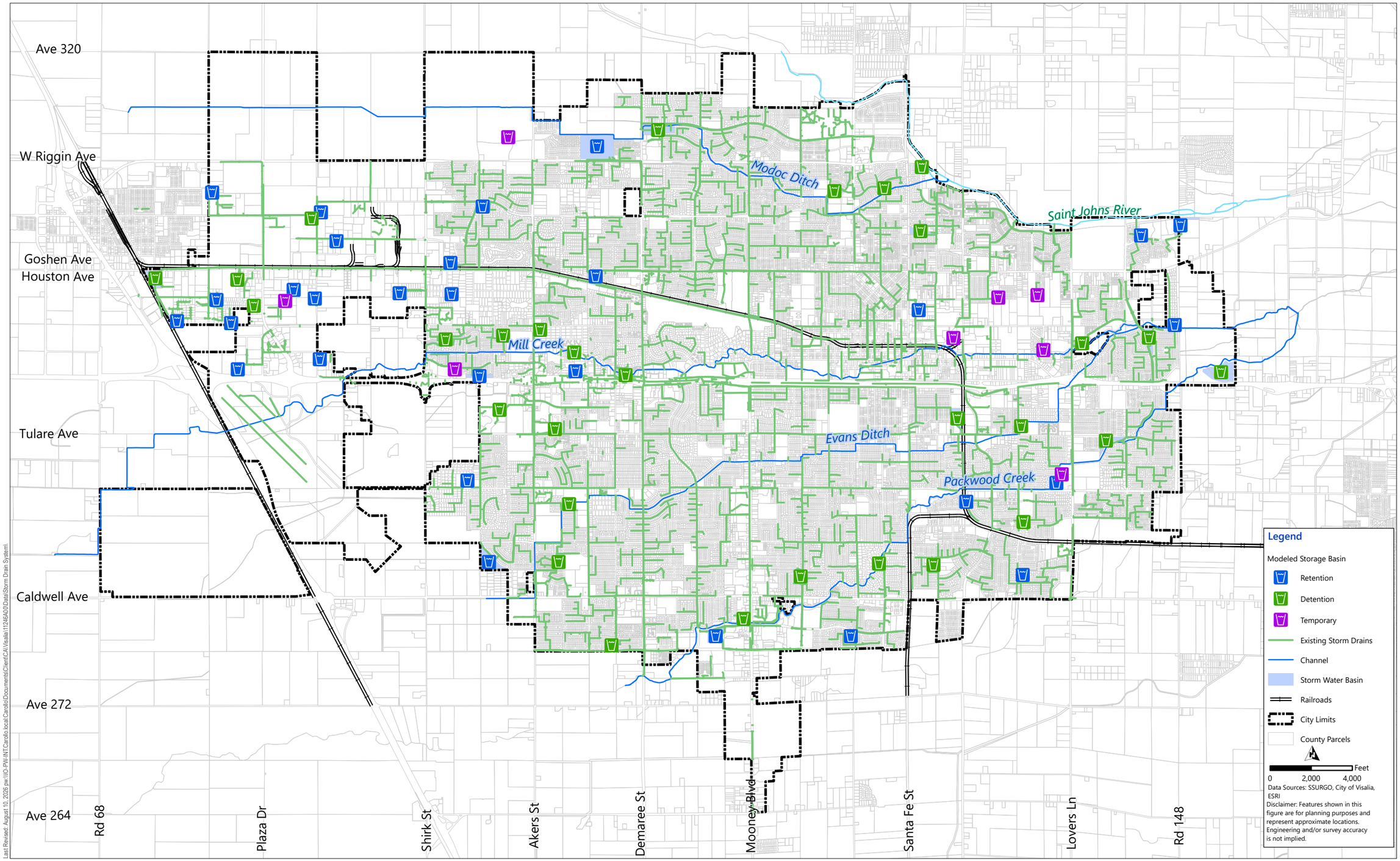

Figure 2.2 Existing Storage Basins
CITY OF VISALIA
MASTER PLANS AND FINANCIAL NEXUS STUDY

2.5 Pump Stations

Pump stations are used throughout the City to move stormwater from storage basins and low-lying drainage areas to receiving facilities where gravity discharge is limited by topography or downstream water levels. Pumping supports system drawdown following storm events and helps manage ponding duration where discharge constraints would otherwise delay basin recovery.

Pump station operations are inherently coupled with downstream receiving conditions, including ditch/canal water surface elevations and allowable stormwater discharge rates. As a result, pump stations should be understood as part of an integrated storage-and-controlled-discharge strategy rather than a standalone "capacity increase" measure. Currently, there are 51 stormwater pumps at 40 locations across the City. The pumps range in capacity from 320 to 13,910 gallons per minute (gpm). Table 2.3 provides a summary of the stormwater pump locations and capacities. Figure 2.3 shows the locations of the pump stations.

Table 2.3 Existing Stormwater Pumps

Pump Location	Discharge	Capacity (gpm)	Capacity (cfs)
Demaree Road & Victor Avenue	Demaree Road storm drain to Packwood Creek	9,000	20.05
Chinowth Street near Evans Ditch	Evans Ditch	2,600	5.8
County Center Drive near Evans Ditch (1/2)	Evans Ditch	2,020	4.5
County Center Drive near Evans Ditch (2/2)	Evans Ditch	2,020	4.5
Creekside Basin near McAuliff Street s/o Mill Creek	Evans Ditch	4,900	10.92
Pinkham Street near Evans Ditch	Evans Ditch	1,400	3.12
Sowell Street near Evans Ditch	Evans Ditch	1,400	3.12
Julieann Court near Feemster Avenue	Feemster Avenue surface	350	0.78
Soroptimist Basin near N Tipton Street n/o Race Avenue	Force main to Mill Creek	5,040	11.23
Locust Street near Oak Avenue	Force main to Mill Creek culvert	750	1.67
The Ranch Basin near Linwood Street & Houston Avenue (SE)	Goshen Avenue storm drain	4,120	9.19
Akers Street near Mill Creek (1/2)	Mill Creek	6,780	15.1
Akers Street near Mill Creek (2/2)	Mill Creek	5,880	13.1
Chinowth Street near Mill Creek (1/2)	Mill Creek	2,500	5.57
Chinowth Street near Mill Creek (2/2)	Mill Creek	2,500	5.57
Crenshaw Street near Mill Creek	Mill Creek	1,200	2.67
Demaree Road near Mill Creek (1/2)	Mill Creek	2,600	5.79
Demaree Road near Mill Creek (2/2)	Mill Creek	4,000	8.91
Mill Creek Garden Park/Pond near Lovers Lane & Mill Creek Parkway (SE)	Mill Creek	1,300	2.89
Mineral King Avenue near Road 86	Mill Creek	380	0.85

Pump Location	Discharge	Capacity (gpm)	Capacity (cfs)
Fairview Village Park/Pond near N Conyer Street & W Wren Drive	Modoc Ditch	3,400	7.58
Giddings Street near Modoc Ditch	Modoc Ditch	400	0.9
Mooney Boulevard near Modoc Ditch (1/2)	Modoc Ditch	1,800	4.01
Mooney Boulevard near Modoc Ditch (2/2)	Modoc Ditch	1,800	4.01
Riverbend Village Park/Pond near N Court Street & E Wren Avenue	Modoc Ditch	760	1.69
Shannon/Modoc Basin near Shannon Parkway & N Demaree Street (SE)	Modoc Ditch	6,600	14.7
Oakwest Basin near Preston/Logan (1/2)	North Mill Creek	1,560	3.48
Oakwest Basin near Preston/Logan (2/2)	North Mill Creek	1,560	3.48
Goshen Ocean Pump / Goshen Drain	North Mill Creek	3,300	7.35
Kiwanis Park near McAuliff Street & Tulare Avenue (SW)	Packwood Creek	2,240	5
Mooney Boulevard Basin near Mooney Boulevard & Cameron Avenue (1/2)	Packwood Creek	13,910	31
Mooney Boulevard Basin near Mooney Boulevard & Cameron Avenue (2/2)	Packwood Creek	13,910	31
Stonebrook south of Caldwell Avenue near Packwood Creek (1/2)	Packwood Creek	5,880	13.1
Stonebrook south of Caldwell Avenue near Packwood Creek (2/2)	Packwood Creek	5,880	13.1
Ben Maddox Way near St. John's River	St. John's River	1,400	3.12
Bradley Street near St. John's River (1/2)	St. John's River	1,960	4.37
Bradley Street near St. John's River (2/2)	St. John's River	1,960	4.37
Buena Vista Avenue near St. John's River (1/2)	St. John's River	6,420	14.3
Buena Vista Avenue near St. John's River (2/2)	St. John's River	8,000	17.82
Cedar Court near St. John's River	St. John's River	5,400	12.03
Combs Park/Pond near S Crenshaw Street & La Vida Avenue	Storm drain along Akers Street to Evans Ditch	4,250	9.47
Ben Maddox Way & Houston Avenue	Storm drain e/o Ben Maddox Way	2,180	4.85
Ben Maddox Way near E Laura Avenue	Storm drain on Ben Maddox Way	1,200	2.67
Caldwell Avenue & Chinowth Street	Storm drain on Caldwell Avenue	2,400	5.35
Tulare Avenue near Cotta Street	Storm drain on Cotta Street to Packwood Creek	500	1.11
Oakwest No. 1 Subd. Basin near N Cottonwood Street & Damsen Avenue (SE)	Storm drain on Cottonwood Street to Mill Creek	320	0.72
Noble Avenue e/o Lovers Lane	Storm drain on Noble Avenue	1,800	4.01

Pump Location	Discharge	Capacity (gpm)	Capacity (cfs)
Cherry Meadow Park/Pond near S Pinkham Street & Cherry Avenue	Storm drain on Pinkham Street to Packwood Creek	670	1.5
Linwood Ranch Basin near Visalia Parkway & S Chinowth Street (NW)	Storm drain on Visalia Parkway to Packwood Creek	4,500	10.03
El Cajon Court near Walnut Avenue	Storm drain to Savannah Heights Basin	6,800	15.15
Sierra Village Basin near Molenstraat s/o State Route 198	Watson Ditch	3,800	8.47

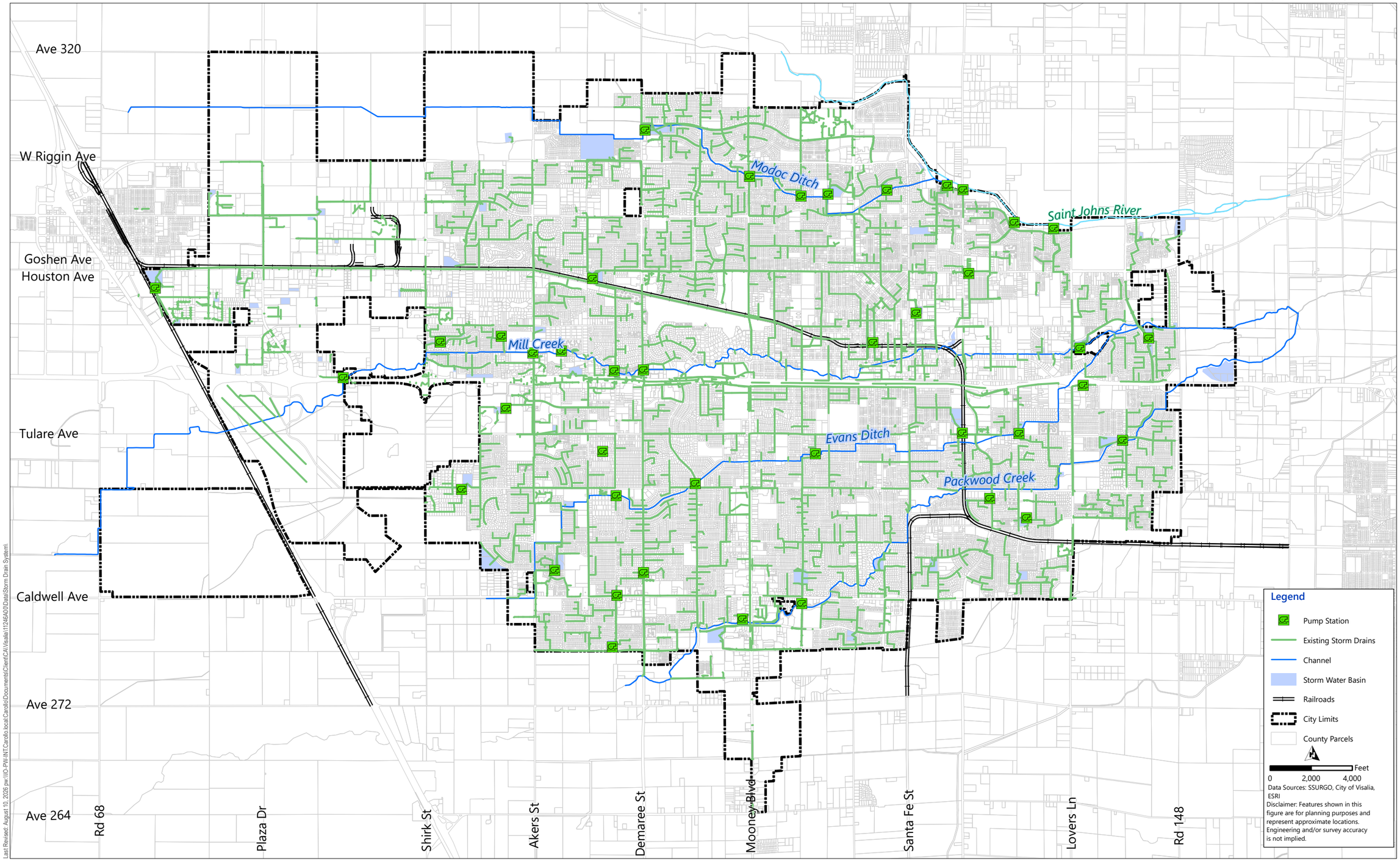

Figure 2.3 Existing Pump Stations
CITY OF VISALIA
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2.6 Storm Drainpipe

The minor drainage system for the City also includes a network of underground storm drains. The pipe ranges in size from 8-inches to 60-inches and is mainly constructed from reinforced concrete. Table 2.4 shows the length of pipe and diameter of the storm drain included in SWMP hydraulic model. Figure 2.4 shows the storm drain currently captured in the City's GIS system and the storm drain included in the model.

Table 2.4 Storm Drain Pipe Length and Diameter

Diameter (inches)	Length (feet)
Circular	
8	565
12	11,056
14	88
15	1,529
18	15,955
20	470
21	8,348
24	107,402
27	9,286
30	92,669
36	48,156
42	41,945
48	53,788
54	8,019
60	9,222
Total (feet)	**408,499**
Total (miles)	**77**
Force Main	
6	1,172
8	626
16	2,299
20	476
Total (feet)	**4,573**
Total (miles)	**1**

The City's GIS storm pipe inventory includes over 290 miles of storm pipe. The SWMP model includes storm pipe of 24-inches in diameter or larger, with some exceptions were smaller diameter storm pipe were included for model connectivity. It is common modeling practice to only include storm pipe of larger diameters due to the cost-benefit of adding the supporting data for all the storm pipe versus the value received from the analysis of all the storm pipe.

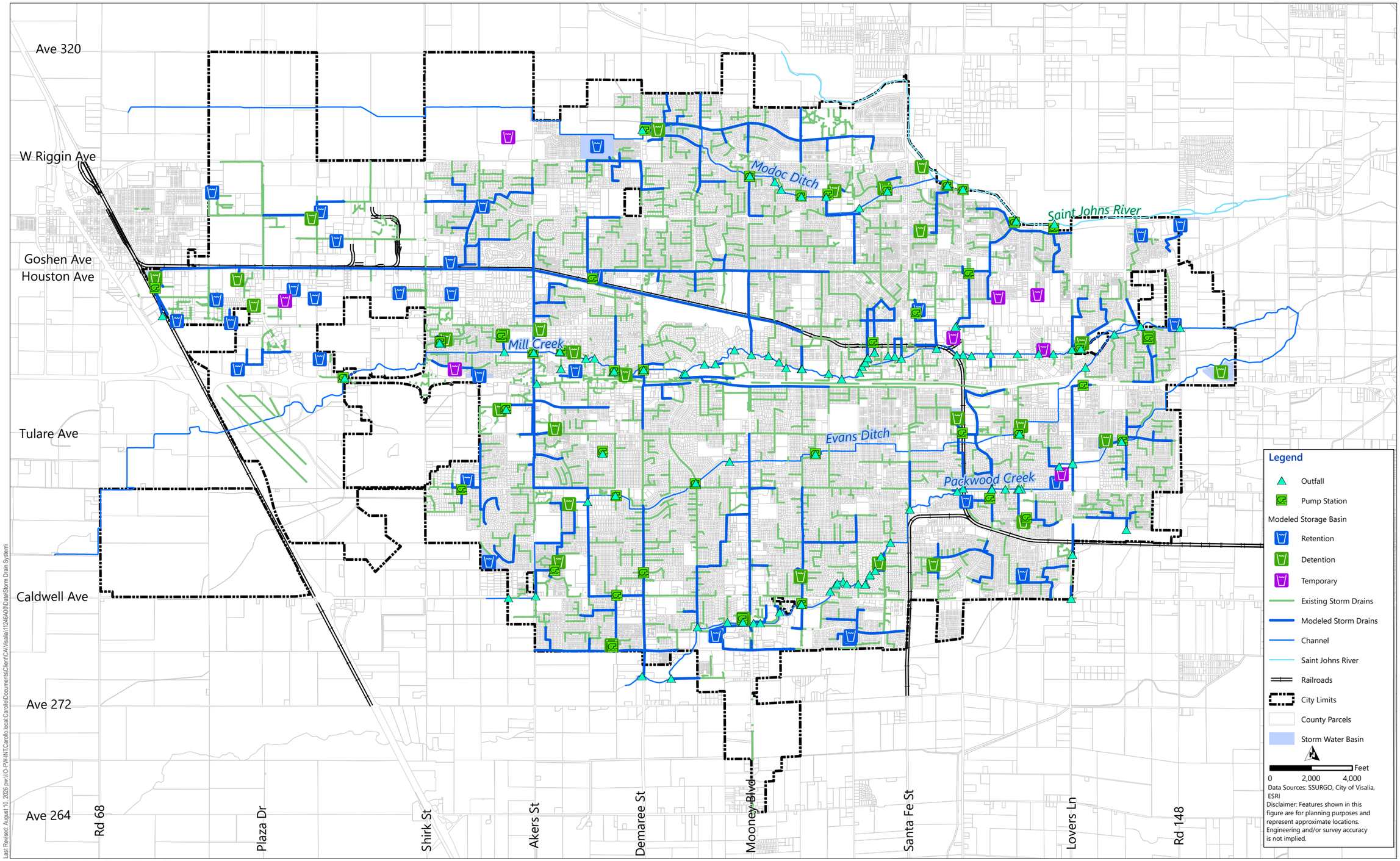

Figure 2.4 Existing Storm Drain System
CITY OF VISALIA
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2.7 Ditch and Channel Capacities

The capacity of the City's major drains is a controlling factor for stormwater discharge and system performance. Major drains may have a physical conveyance capacity that varies by reach condition, vegetation, sediment, and tailwater, and they may also be subject to operational limitations when irrigation deliveries or flood releases occupy channel capacity.

The agreed-upon City capacity based on the ditch and channel use agreements, the 1994 SWMP channel capacities, and the channel capacities calculated during this study are provided in Table 2.5.

Table 2.5 Channel Capacities

Creek Name	Agreed City Capacity	1994 SWMP Channel Capacity	Updated Channel Capacity
Mill Creek	N/A	147 to 1,169 cfs	100 to 600 cfs
Packwood Creek	N/A	515 to 1,477 cfs	150 to 400 cfs
Evans Ditch	1/2	140 to 277 cfs	50 to 200 cfs
Modoc Ditch	1/3	154 to 674 cfs	50 to 250 cfs
Persian Ditch	1/3	68 to 223 cfs	70 to 230 cfs
Watson Ditch	1/3	131 cfs	130 cfs

Notes:
N/A - not applicable.

The updated capacity ranges differ from the 1994 SWMP because the analyses used different hydraulic methods and definitions of practical channel capacity. Chapter 5 describes the reasons for the differences.

2.8 Ditch and Channel Use Agreements

Stormwater discharge from the City is routed to major drains that are owned and/or operated by irrigation districts and ditch companies. The City has entered into shared-use agreements that define the conditions under which stormwater may be discharged to these facilities. These agreements establish allowable discharge locations and operational constraints during simultaneous-use conditions (such as irrigation deliveries or flood releases that reduce available channel capacity), define maintenance responsibilities within City limits, require controls and coordination for new discharge points, and provide mechanisms for coordination during events when combined flows approach or exceed channel capacity.

For master planning purposes, these agreements are used to define practical discharge constraints and receiving conditions for shared-use waterways. Agreement provisions by facility (Mill Creek, Packwood Creek, Evans Ditch, Modoc Ditch, Persian Ditch, Watson Ditch, and the Tulare Irrigation Canal) are provided in Appendix A.

CHAPTER 3 BASIS OF DESIGN

This chapter summarizes the basis of design used to evaluate the City's storm drainage system and to develop planning-level recommendations. The basis of design includes:

1. The target level of protection for different elements of the drainage system.
2. The role of LID requirements under the City's MS4 program.
3. The primary software tools and data sources used for technical analyses.

The City's storm drainage system consists of both underground storm drains and aboveground conveyance pathways, including streets, swales, and open channels that function as major drains. Because system performance is strongly influenced by the City's relatively flat topography, the basis of design recognizes that exceedance flows will occur during larger storm events and that overland flow must be considered as part of how the system functions.

3.1 Level of Protection

Stormwater planning typically distinguishes between a minor (collector) drainage system intended to manage frequent storms with tolerable nuisance flooding, and a major drainage system (e.g., principal open channels and waterways) intended to convey larger, less frequent events. The 1994 SWMP established the foundational framework still reflected in City practice: major drains provide the backbone of the system and generally serve drainage areas greater than approximately 100 acres, while minor drains convey runoff from smaller tributary areas to the major system.
A common drainage standard is to provide a system that will limit major damage from a major storm expected to occur once in 50-100 years and to limit nuisance flooding from storm events that would occur on average once in 2-10 years. Excess storm runoff within the City tends to distribute rather than concentrate because of the relatively flat topography. This distribution of flows greatly reduces the threat of major flood damage from local storms. As a result, the intent is to provide a drainage system with the primary purpose of preventing the more frequent nuisance flooding from relatively frequent storms.

3.1.1 Storm Drainage Design Criteria

The City's day-to-day storm drainage design and development review utilizes the Rational Method. This criterion not only specifies level of protection, but also runoff coefficients and storage volumes to be used during the evaluation.

The City's current Storm Drainage Design Criteria level of protection is summarized in Table 3.1. The criteria in effect at the time this SWMP was prepared are included in Appendix B. The City is preparing an update to its storm drain standards. Once adopted, the updated standards will supersede the criteria included in Appendix B and should be used for subsequent project design and development review.

Table 3.1 Storm Drainage Design Criteria Level of Protection

Item	Level of Protection
Minor (Collector) Drains	2-Years
Major Drains	10-Years
In-Town Detention Basins	10-Years – 10-Days Volume
In-Town Retention Basins	10-Years – 10-Days Volume
Industrial Park Retention Basin	10-Years – 10-Days Volume
Downstream Ultimate Storage Basins	10-Days – 50-Years Volume

3.1.2 Stormwater Master Planning Criteria

Criteria and the subsequent evaluation for both the minor drainage system (City internal drainage) and the major drainage system (waterways the City's internal drainage discharges into) are outlined below.

Two separate approaches were taken for purposes of efficiency and to take advantage of the existing modeling from previous planning efforts; HEC-RAS models for Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek were developed through these previous planning efforts.

3.1.2.1 Minor Drainage System

Stormwater master planning generally utilizes more complex modeling software meant to evaluate larger systems and the impacts subparts of each system has on the whole. The minor drainage system is evaluated in USEPA-SWMM version 5.2.4. This software was selected due to its ability to assess complex drainage systems such as that of the City and its cost.

The traditional approach to stormwater master planning is to directly apply the current criteria to the City's system utilizing standard methods. Because the majority of the City's system was not designed to the current criteria, this results in numerous deficiencies when the current system is evaluated against it. Many of these identified deficiencies are not experienced during rain events. Careful thought was taken to understand the best way to evaluate the City's system as a whole given the design criteria utilized as the City developed. The City conducted a thorough analysis and created the resulting Existing and Future Conditions master planning criteria. Of particular interest was how the resulting master planning model results aligned with the runoff coefficients referenced during design. Iterations were conducted until this condition was satisfied.

The Existing Conditions and Future Conditions criteria are different because the Existing Conditions criteria evaluates the existing infrastructure based on how it was designed, while Future Conditions evaluates the future infrastructure considering the current design criteria. The following criteria are being utilized for this study:

- **Existing Conditions Criteria**: Three, 2-year, 24-hour storm events spaced 6 days apart. This was developed to generate effective runoff responses consistent with the City's contemporaneous design basis for much of the existing system.
- **Future Conditions Criteria**: Three, 2-year, 24-hour storm events spaced 2 days apart. This was developed to produce slightly higher runoff and better match the City's retention basin sizing and management approach.

The City's current improvement standard references a 10-year, 10-day total rainfall depth (historically listed as 4.17 inches). However, the City's runoff coefficients used in Rational Method calculations are calibrated to the 2-year storm intensity, and storage volume calculations based on the Rational Method incorporate rainfall intensity indirectly through those coefficients.

As a result, representing the retention basin criterion in SWMM as a sequence of 2-year-intensity events that sum to approximately the 10-day total depth provides a closer match to how the City's standards have been applied in practice. Accordingly, the revised design storm approach represents the retention basin total rainfall depth using three 2-year, 24-hour storms (approximately 1.40 inches each) for a total of approximately 4.2 inches, with storm spacing selected to reflect soil drying and recovery behavior in SWMM.

Existing Conditions

To understand if the existing system meets the master planning criteria, the following comparison is completed:

- Junctions:
  - Depth of flooding above the rim elevation shall not exceed 0.5 feet.
  - Hours flooded should be less than the total rainfall duration (72 hours).
- Storage Nodes:
  - Basins shall have at least 1 foot of freeboard.

Future Conditions

To understand if the future system meets the master planning criteria, the following comparison is completed for any proposed infrastructure:

- Junctions:
  - Depth of flooding above the rim elevation shall not exceed 0.5 feet.
  - Hours flooded should be less than the total rainfall duration (72 hours).
- Storage Nodes:
  - Basins shall have at least 1 foot of freeboard.
  - Basins will utilize the standalone retention basin concept.

3.1.2.2 Major Drainage System

The major drainage system was evaluated in HEC-RAS and the FHWA Hydraulic Toolbox. HEC-RAS is widely used for one-dimensional open-channel hydraulics and enables efficient screening of water surface profiles and capacity constraints along long ditch/creek corridors based on cross-sectional data and structures. The FHWA Hydraulic Toolbox is widely used for the hydraulic evaluation of less complex open-channels conveyance.

The City's stormwater discharges into the waterways were quantified and the channel capacities determined. The waterways were evaluated on their ability to contain storm flow discharges within their banks.

3.2 Low Impact Development

LID is a requirement of the City's MS4 General Permit (Order No. 2013-001-DWQ) and requires applicable development and redevelopment projects to reduce and treat stormwater runoff on or near the project site. In general, projects subject to LID design standards include:

- New development projects on public or private land that fall under the planning and permitting authority of the City.
- Redevelopment projects on public or private land that fall under the planning and permitting authority of the City that result in an increase of more than 50 percent of the impervious surface of the previously existing development.
- Public road projects that create 5,000 square feet or more of newly constructed contiguous impervious surface.
- Linear underground/overhead projects that create 5,000 square feet or more of newly constructed contiguous impervious surface.

LID requirements affect storm drain infrastructure planning in two primary ways:

1. **Runoff reduction and flow control for new/redevelopment**. To the extent that LID is implemented as required, the volume and peak rate of runoff discharged from new and redevelopment sites to the public system may be reduced relative to traditional development. This can lower incremental demands on downstream pipes and basins for future growth areas.
2. **Hydromodification management under MS4**. The City's MS4 program includes hydromodification requirements intended to limit changes in runoff response due to development, including criteria that post-development peak runoff should not exceed pre-development peak runoff for the 2-year, 24-hour storm. This requirement reinforces the City's long-standing emphasis on managing the more frequent nuisance-flooding events and ties development controls directly to the service level most relevant to minor drainage performance.

LID can be an effective stormwater management approach when applied correctly and should be incorporated where areas are redeveloped or newly developed. Existing developed areas where redevelopment is not anticipated can consider LID, however, more traditional stormwater management techniques such as increased conveyance or storage will likely be more effective. Should LID be incorporated into existing developed areas, this can result in the reduction of some nuisance flooding and can be used to add resilience to the system.

For conservative flood-control planning and to provide a factor of safety, runoff reduction or flow-control benefits attributable to LID were not assumed or credited in the hydrologic modeling or in the sizing of the master-planned storm drainpipes and storage basins. The master-planned facilities were sized using the Future Conditions land-cover and soil assumptions without relying on subdivision- or project-specific LID measures. This approach avoids under sizing regional infrastructure based on measures that may vary by project, location, implementation timing, and long-term maintenance. LID requirements remain applicable to qualifying development and redevelopment projects and should be addressed separately during project-specific design and permitting.

3.3 Software Programs and Available Data

Table 3.2 describes the major software programs used in this study.

Table 3.2 Software Programs

Program	Description
HEC-RAS Version 6.6	Hydraulic model for open channels developed by USACE.
USEPA-SWMM Version 5.2	Dynamic rainfall-runoff simulation model for basin, pumps, and pipe network developed by the USEPA.
AutoCAD 2019	Computer Aided Drafting program by Autodesk Inc.
ArcGIS Version 10.	GIS software developed by Esri.

Notes:
ESRI - Environmental Systems Research Institute.

Numerous documents and data were collected and reviewed during the development of the SWMP, as described in Table 3.3.

Table 3.3 Available Data

Data	Source
Precipitation	NOAA Atlas 14 data.
Soils	USDA WSS.
Land Cover	USGS NLCD 2019.
Storage	City-provided information, including updated stage-storage curves for storage basins missing information in 2005 model.
Pump Stations	City-provided information on installed pump horsepower ratings and pump curves as available.
Storm Drain	City-provided information, including the 2005 stormwater model and as-built plans as available.
Topographic	City-provided LiDAR from 2006.
Previous Studies	1994 SWMP by Boyle Engineering Corporation, 2005 stormwater model developed in Info SWMM, and Packwood Creek hydraulic study.

Notes:
NLCD - National Land Cover Database; USGS - United States Geological Survey; WSS - Web Soil Survey.

CHAPTER 4 HYDROLOGIC ANALYSIS

Two hydrologic models of the City were developed as part of this SWMP. Models were built to:

1. Reflect the current buildout of the City (existing conditions).
2. Designated future development land uses, including planning areas in the Tier 3 development boundary (future conditions).

This chapter describes the hydrologic methodology used to estimate runoff generated by existing and future development conditions. The chapter also documents the modeling approach, design storm scenarios, subcatchment delineation, rainfall data, infiltration methodology, and hydrologic parameter assumptions used to support the hydraulic analysis described in subsequent chapters.

4.1 Modeling Approach

The City's stormwater system was evaluated using the USEPA SWMM. Hydrologic inputs were developed at the subcatchment level, and runoff was routed through the storm drain system to downstream facilities and outfalls. Rainfall depth-duration-frequency (DDF) values were derived from NOAA Atlas 14 data, and infiltration (rainfall losses) was computed using the Natural Resources Conservation Service (NRCS) Curve Number (CN) method.

4.1.1 Previous Plan

The 1994 Plan used the kinematic wave overland flow plane runoff computation option in HEC-1. The kinematic wave method represents a subcatchment as an open channel (a very wide, open channel), with inflow to the channel equal to the excess precipitation calculated after the losses are determined through the CN method. This routing method solves the continuity equation along with a simplified form of the momentum equation for both pervious and impervious areas for each timestep. The simplified form of the momentum equations assumes that the slope of the water surface equals the slope of the subcatchment. Following each timestep the impervious and pervious results are summed to create the runoff volume and peak flow for each subcatchment.

4.1.2 Current Plan

This SWMP uses USEPA-SWMM's default hydrologic method, the nonlinear reservoir model. In this model, ponded water (runoff greater than the depressional storage) can become runoff outflow. For each timestep, Manning's equation is used to calculate the runoff volumetric flow rate for both the impervious and pervious areas of the subcatchment assuming the subcatchment is a wide, shallow channel with a slope equal to the slope of the subcatchment. As with the previous method, following each timestep the impervious and pervious results are summed to create the runoff volume and peak flow for each subcatchment.

4.2 Scenarios

Hydrologic simulations were completed for Existing Conditions (current development and drainage infrastructure) and Future Conditions (General Plan buildout with planned trunk infrastructure).

- As described in the previous section, the City developed the following Existing and Future Conditions design storms to be used in this master planning computer modeling:
  - Existing Conditions Evaluation Storm: three (3) sequential 2-year, 24-hour storms separated by a 6-day gap.
  - Future Conditions / Retention Basin Sizing Storm: three (3) sequential 2-year, 24-hour storms separated by a 2-day gap.

4.3 Subcatchment Delineation

Hydrologic parameters were calculated at the subcatchment level. Subcatchments are unique areas of land that discharge to the same location. The Existing Conditions model has 708 subcatchments and the Future Conditions model contains 881 subcatchments. Subcatchments were delineated primarily based on the storm drain network, with future subcatchments expanded/edited to represent planned growth and proposed stormwater infrastructure (trunk, retention facilities, and pump facilities).

The Existing Conditions subcatchments are shown in Figure 4.1, and the Future Conditions subcatchments are shown in Figure 4.2.

Please note, some catchments within the northwest portion of the system only required modeling of street surfaces since industrial-zoned properties are required to contain all stormwater from the property onsite.

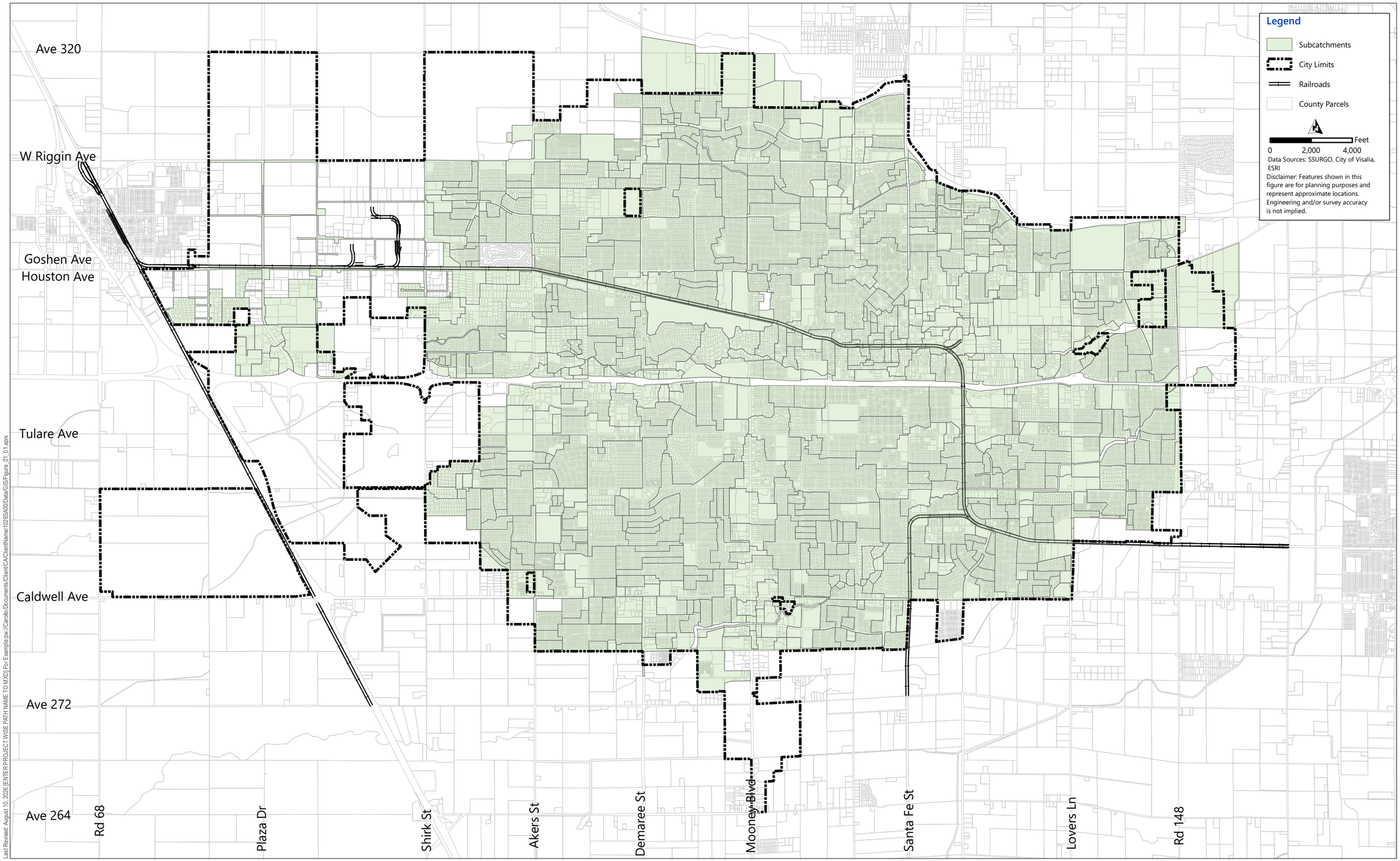

Figure 4.1 Existing Conditions Model Subcatchments
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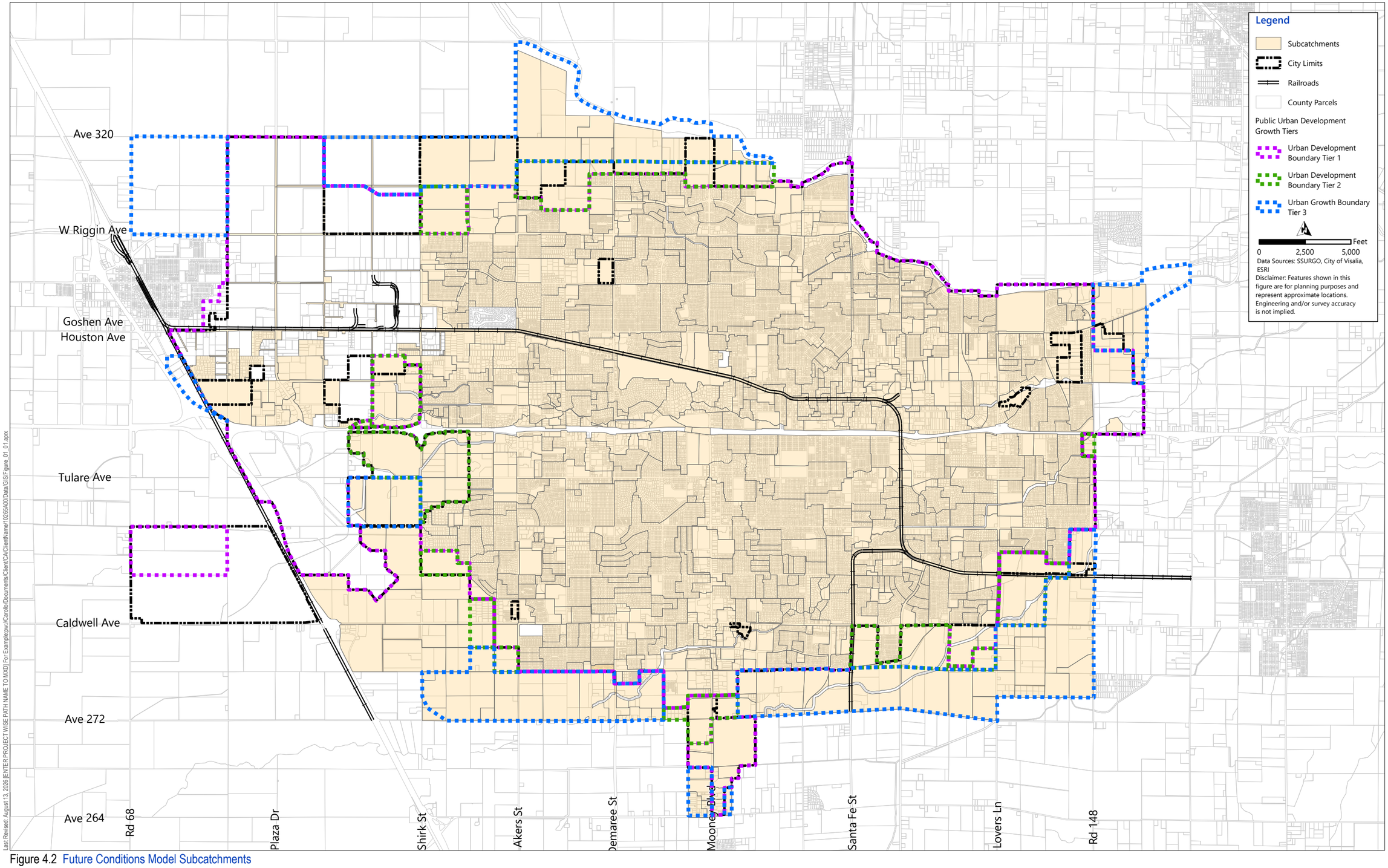

Figure 4.2 Future Conditions Model Subcatchments
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4.4 Rainfall Data

The precipitation DDF values reported in the 1994 SWMP are summarized in Table 4.1 for historical comparison. These values were developed from the Exeter station, the closest continuous recording gage to the City.

To represent Visalia, the short-duration (5 minutes to 1 day) Exeter station data was reduced by 10 percent, and the long-duration values were developed from the standard gage rainfall data collected manually in Visalia.

Table 4.1 Precipitation Depth-Duration-Frequency from 1994 SWMP

Duration	2 Years (inches)	5 Years (inches)	10 Years (inches)	25 Years (inches)	50 Years (inches)
5 minutes	0.14	0.18	0.22	0.26	0.29
10 minutes	0.18	0.24	0.29	0.34	0.39
15 minutes	0.20	0.27	0.32	0.39	0.43
30 minutes	0.24	0.34	0.40	0.48	0.53
1 hours	0.34	0.47	0.56	0.67	0.74
2 hours	0.50	0.68	0.80	0.96	1.07
3 hours	0.60	0.83	0.98	1.18	1.31
6 hours	0.78	1.08	1.28	1.53	1.71
12 hours	1.03	1.42	1.68	2.01	2.24
1 day	1.28	1.76	2.09	2.48	2.77
2 days	1.55	2.20	2.64	3.19	3.59
5 days	1.98	2.87	3.48	4.24	4.79
10 days	2.41	3.47	4.17	5.04	5.67

The DDF values were updated using NOAA Atlas 14, Volume 6, Version 2, and these updated values are summarized in Table 4.2. The data from the updated NOAA Atlas 14 shows that rainfall depths have decreased slightly for most durations and frequencies from the data used in 1994 SWMP.

Table 4.2 Current Precipitation Depth-Duration-Frequency

Duration	2-Years (inches)	5-Years (inches)	10-Years (inches)	25-Years (inches)	50-Years (inches)	100-Years (inches)
5 minutes	0.10	0.12	0.15	0.20	0.24	0.29
10 minutes	0.14	0.18	0.22	0.28	0.34	0.41
15 minutes	0.16	0.22	0.26	0.34	0.41	0.50
30 minutes	0.23	0.30	0.36	0.47	0.57	0.68
1 hour	0.31	0.40	0.49	0.64	0.77	0.93
2 hours	0.45	0.57	0.69	0.87	1.0	1.2
3 hours	0.56	0.71	0.84	1.1	1.2	1.5
6 hours	0.78	0.98	1.2	1.4	1.7	2.0
12 hours	1.1	1.4	1.6	2.1	2.4	2.8

Duration	2-Years (inches)	5-Years (inches)	10-Years (inches)	25-Years (inches)	50-Years (inches)	100-Years (inches)
1 day	1.4	1.9	2.3	2.9	3.4	3.9
2 days	1.7	2.2	2.7	3.4	4.0	4.6
3 days	1.9	2.5	3.0	3.7	4.4	5.1
4 days	2.1	2.7	3.2	4.0	4.7	5.4
7 days	2.4	3.1	3.7	4.6	5.3	6.1
10 days	2.7	3.4	4.1	5.0	5.7	6.5

NOAA Atlas 14 DDF estimates are the basis for the rainfall depths used to develop design storm hyetographs for SWMM evaluation. This master plan applies a single representative set of Atlas 14 values across the City to maintain consistency in design criteria and interpretation of system performance.

This approach mirrors the intent of a master plan-level standard: uniform application of design rainfall assumptions across the planning area.

The location information for the representative extraction point is as follows:

- Name: Visalia, California, USA (Source: ESRI Maps).
- Latitude: 36.3283°
- Longitude: -119.2992°
- Elevation: 329 feet (Source: USGS).

For final design and project-specific analysis, site-specific Atlas 14 values (and locally appropriate temporal distributions) are applied at the project location to refine design storms and confirm final sizing.

4.5 Infiltration

Infiltration (rainfall losses) was simulated using the NRCS CN method in USEPA-SWMM. This methodology utilizes the current land cover (impervious versus pervious) and the hydrologic soil group (HSG). In general, the lower the CN, the more infiltration that can occur.

The CN is made up of the amount of pervious and impervious land cover and the HSG. The more pervious a land cover, the more infiltration that can occur. HSGs range from A (sand/gravel) to D (clay); the more sand/gravel in a soil type, the more infiltration that can occur.

4.5.1 Existing Conditions

CNs were generated using land cover and impervious data from NLCD 2019 and HSG data referenced from the USDA WSS. A weighted average CN was calculated by determining the area of each land use and HSG within each subcatchment. A single composite CN was developed for each subcatchment. This process was facilitated by using spatial analysis techniques within GIS software.

Table 4.3 shows the CN for each land cover type for the corresponding HSG utilized for this study.

Table 4.3 Composite Curve Numbers for specific HSG and NLCD Landcover

NLCD Landcover Type	HSG A	HSG B	HSG C	HSG D
Open Water	100	100	100	100
Perennial Ice/Snow	40	40	40	40
Developed, Open Space	52	68	78	84
Developed, Low Intensity	81	88	90	93
Developed, Medium Intensity	84	89	93	94
Developed High Intensity	88	92	93	94
Barren Land (Rock/Sand/Clay)	70	81	88	92
Deciduous Forest	32	48	57	63
Evergreen Forest	39	58	73	80
Mixed Forest	46	60	68	74
Shrub/Scrub	40	42	55	62
Grassland/Herbaceous Arid	40	63	75	85
Pasture/Hay Fair	40	61	73	79
Cultivated Crops	62	74	82	86
Woody Wetlands	86	86	86	86
Emergent Herbaceous Wetlands	80	80	80	80

Development density has varying definitions depending upon the source of the data. NLCD includes the following definitions for developed areas:

- **Developed, Open Space**: areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
- **Developed, Low Intensity**: areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20 percent to 49 percent of total cover. These areas most commonly include single-family housing units.
- **Developed, Medium Intensity**: areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50 percent to 79 percent of the total cover. These areas most commonly include single-family housing units.
- **Developed High Intensity**: highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 percent to 100 percent of the total cover.

While NLCD 2019 offers a consistent regional dataset, it does not always precisely reflect current site-specific conditions required for municipal drainage modeling, particularly in areas experiencing recent development, redevelopment, or where open space and low-intensity development may be misclassified.

To more accurately represent present land use, the NLCD-based land cover layer was compared to the latest available aerial imagery and updated wherever differences were identified. Instances of discrepancy,

such as newly developed residential areas, modifications in commercial zones, or conversions from open space to residential or industrial uses, were corrected through manual edits to the NLCD layer based on observed conditions. This validation process helped ensure the land cover data supporting drainage modeling accurately depicted the contemporary landscape, thereby minimizing potential errors in runoff calculations and enhancing model reliability. This methodology is helpful for municipal planning because it incorporates local changes that regional datasets may overlook, including small-scale development, recent construction activity, and shifts in land management practices.

Additionally, this SWMP reflects updated soil survey mapping. In the 1994 master plan, the USDA mapping characterized the dominant mapped soils as HSG C, while the updated USDA WSS mapping indicates the dominant soil type is HSG B in much of the City.

Figure 4.3 shows the HSGs. Figure 4.4 shows the 2019 existing conditions NLCD land cover in Visalia.

4.5.2 Future Conditions

Future Conditions CNs were developed using General Plan land uses, known future development information, updated future drainage areas, and the same HSG data used for the Existing Conditions model. Future land cover assumptions were applied to represent planned buildout within the Tier 3 UGB and other future growth areas included in the model.

Composite CNs were calculated for each Future Conditions subcatchment based on the weighted combination of future land cover and mapped HSG. Where more specific development information was available, future land cover assumptions were refined to better represent the anticipated drainage condition. This approach provides a consistent runoff basis for evaluating future trunk conveyance, storage basin sizing, and FCIPs. Figure 4.5 shows the 2030 General Plan Land Use and future known developments.

4.6 Subcatchment Width

The width parameter affects how quickly runoff is produced in each subcatchment. The longer the width, the less precipitation is stored, and therefore the runoff hydrograph rises and falls more quickly.

The width for each subcatchment in both Existing and Future Conditions was calculated by dividing the subcatchment area by the overland flow path length. Overland flow path lengths were measured for approximately 5 percent of the subcatchments with varying land covers and used to estimate the lengths for similar subcatchments. In general, residential area flow paths averaged 125 feet, undeveloped fields and park areas averaged 500 feet, and highly developed urban areas measured less than 100 feet.

For Future Conditions subcatchments created or modified as part of the future drainage network and FCIP development, width values were assigned using the same methodology applied to the Existing Conditions model. Where proposed subcatchments represent future development areas or revised tributary areas to planned trunk infrastructure, overland flow path assumptions were reviewed for consistency with the anticipated drainage pattern, land use, and modeled outlet location.

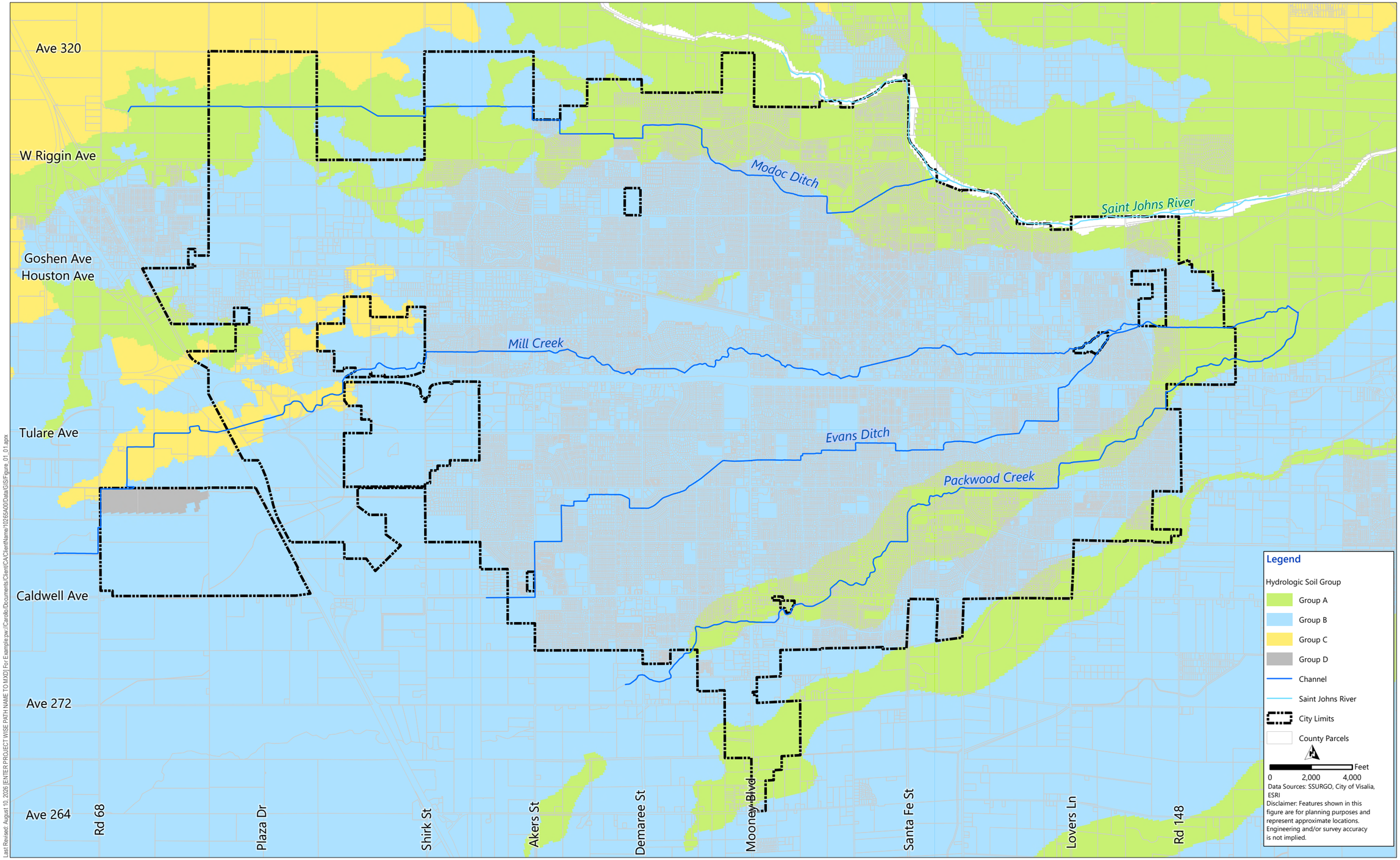

Figure 4.3 Hydrologic Soil Groups
CITY OF VISALIA, CA
MASTER PLANS AND FINANCIAL NEXUS STUDY

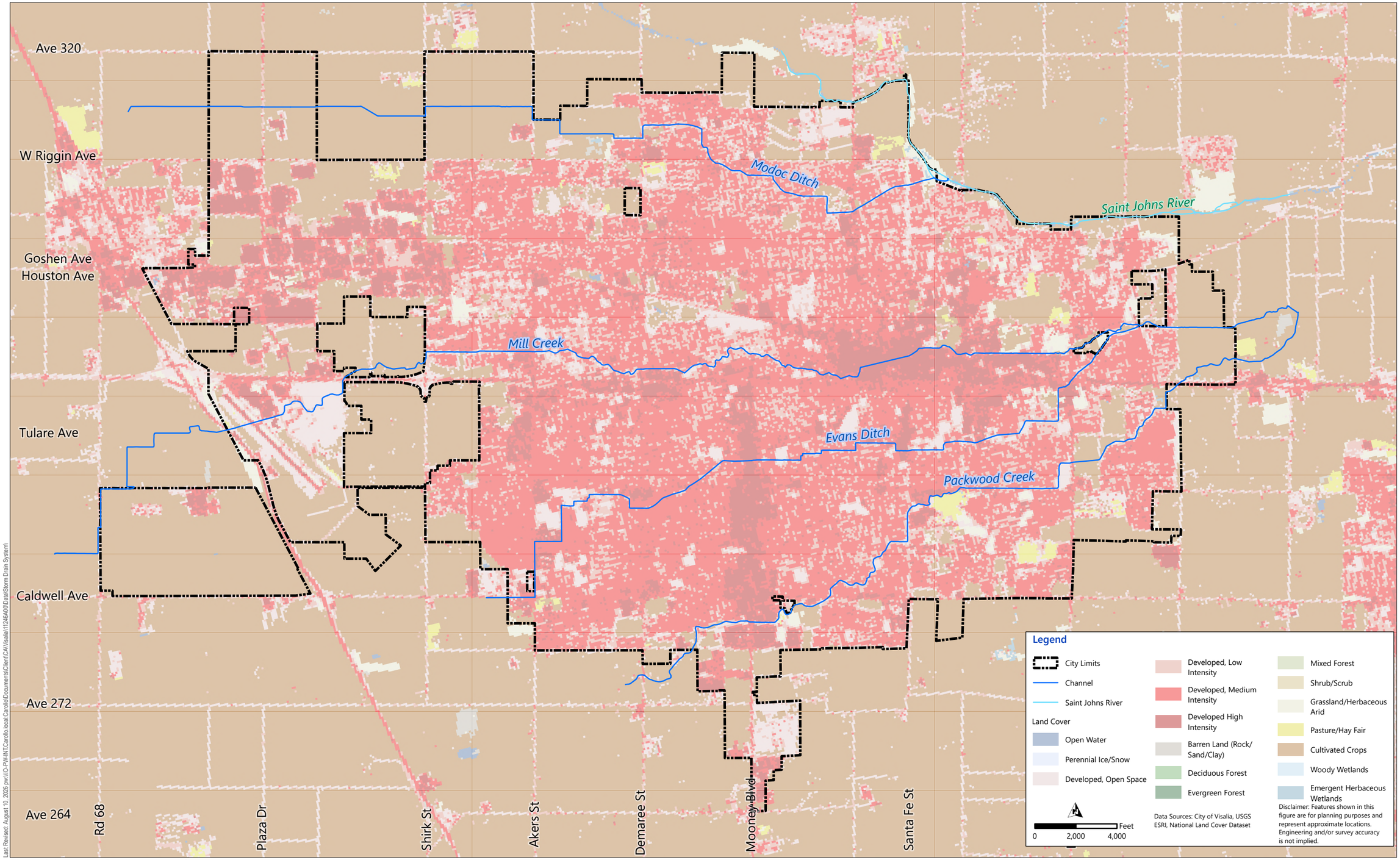

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Figure 4.4 Existing Conditions Land Cover
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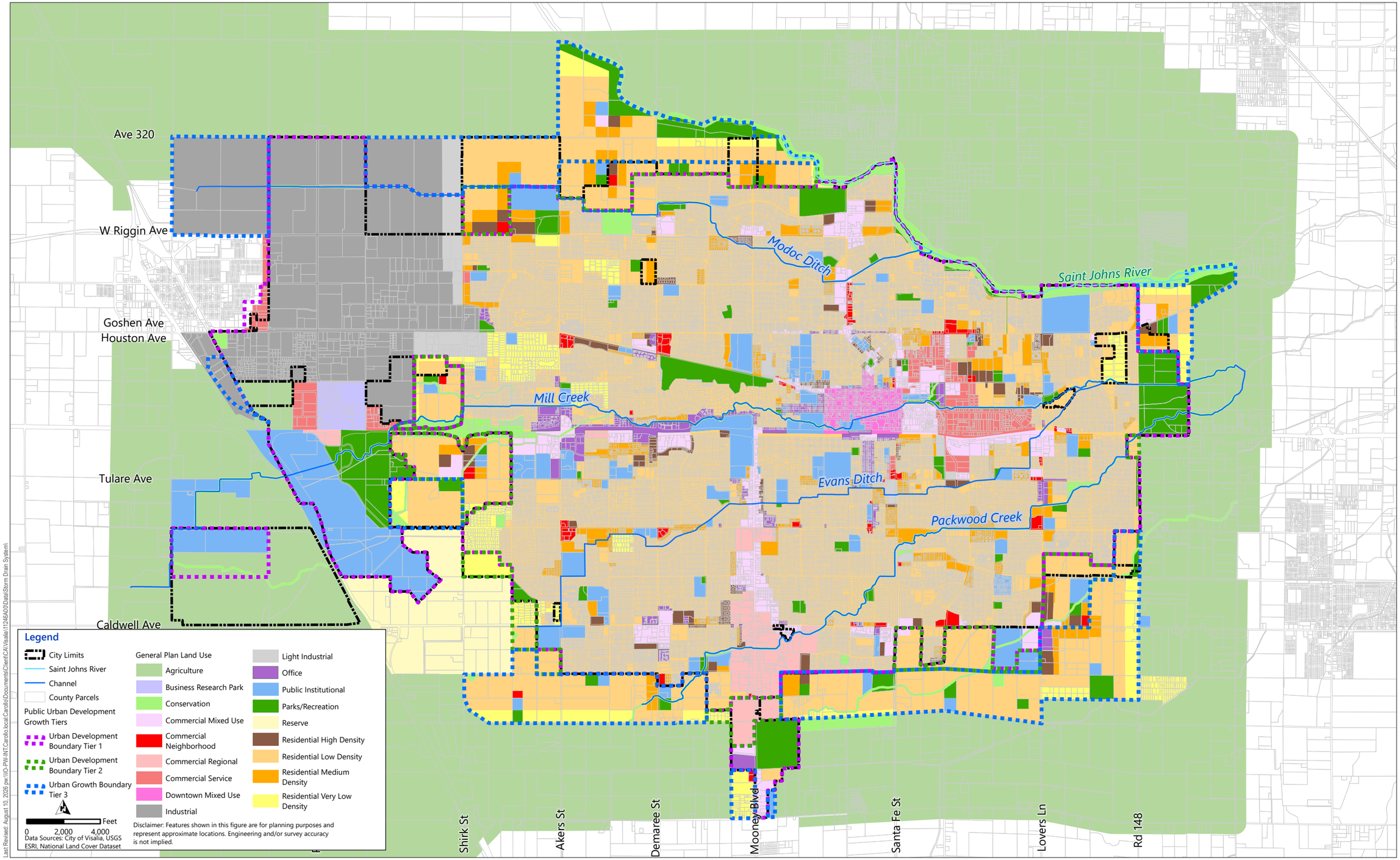

Figure 4.5 2030 General Plan Land Use
CITY OF VISALIA, CA
MASTER PLANS AND FINANCIAL NEXUS STUDY

4.7 Subcatchment Slope

The slope for each subcatchment in both Existing and Future Conditions was calculated by rasterizing the topographic data provided by the City and calculating zonal statistics by subcatchment using spatial analysis techniques. Subcatchment slopes varied from 0 percent to 4.2 percent, with 95 percent of the subcatchments having a slope less than 1 percent.

Subcatchment slope was confirmed and refined because it directly influences runoff timing and peak rate in USEPA-SWMM. In areas of low relief where GIS-derived slopes can be near-zero due to terrain resolution limitations, zero-slope subcatchments were corrected to representative slopes that reflect the expected drainage behavior. Representative slopes were selected based on adjacent topographic context and drainage characteristics, and slope refinements were applied consistently to maintain stable runoff routing and realistic hydrograph timing.

For Future Conditions subcatchments created or modified as part of future drainage network and FCIP development, slopes were reviewed for consistency with the anticipated future drainage pattern and modeled outlet location. Where proposed subcatchments represent future development areas, final project design should confirm slopes using detailed grading plans and survey data.

4.8 Percent Imperviousness

Percent imperviousness within the subcatchments was set to 0 percent for all subcatchments. This is due to using the CN approach for the infiltration method.

The CN infiltration method incorporates the impervious area into the CNs. In USEPA-SWMM any defined impervious area is routed directly to the subcatchment outlet. Therefore, if the percent imperviousness of the subcatchment was also entered, it would result in double-counting the runoff-response of the impervious areas.

4.9 Subcatchment Subareas

Subcatchment subarea parameters were updated to be consistent with CN Infiltration Method as discussed in the SWMM Reference Manual, Volume 1-Hydrology (Revised).

Combined, these subarea settings ensure that: (1) runoff initiation and abstraction are represented through CN-derived initial abstraction; (2) runoff volume is controlled by CN infiltration/loss behavior; and (3) runoff timing is controlled primarily through subcatchment geometry and slope, providing a consistent basis for comparing results across subcatchments and between existing and future conditions.

4.9.1 Pervious Depression Storage (Initial Abstraction)

Pervious depression storage was set equal to the initial abstraction depth associated with each subcatchment's CN value. Initial abstraction was computed as:

$$IA = 0.2S, \textit{ where } S = (1{,}000/CN) - 10$$

Because CN varies by subcatchment, depression storage values were assigned on a subcatchment-specific basis rather than using a single uniform value model-wide. This update ensures that the onset of runoff and rainfall losses are represented consistently with the CN framework.

4.9.2 Pervious Surface Roughness (Manning's n)

Pervious Manning's n within subarea routing was set to 0. This setting avoids introducing additional runoff delay inside the subcatchment that would otherwise compound with timing already represented through subcatchment geometry (width) and slope under the nonlinear reservoir method. With this configuration, hydrograph timing is controlled primarily by geometry and slope assumptions rather than internal subarea routing friction.

4.9.3 Subarea Routing

Subarea routing was set so that runoff is routed directly to the subcatchment outlet. This simplification reduces internal routing complexity and avoids unnecessary alteration of hydrograph timing while maintaining the intended loss representation.

Tables summarizing the existing conditions hydrologic parameters can be found in Appendix C. Future conditions hydrologic parameters for each subcatchment can be found in Appendix D.

4.10 Assumptions and Limitations

The following assumptions and limitations apply to this section:

1. While Atlas 14 estimates can vary across the City, that variability is not expected to materially change the master plan's planning-level conclusions when a single consistent set of rainfall depths is applied across all models and alternatives. The master plan is intended to support comparative evaluation, identifying relative system constraints, screening improvement concepts, and prioritizing capital projects.
2. Using one consistent Atlas 14 dataset ensures that differences in predicted flooding, surcharge, and conveyance performance are driven by system hydraulics and proposed improvements (not by shifting rainfall inputs across locations). Any spatial variation in Atlas 14 depths would primarily scale results up or down slightly, but it would not be expected to change the overall identification of major problem areas or the relative ranking of improvement options at the planning level.
3. Because HSG B generally represents greater infiltration potential than HSG C, use of the updated USDA WSS mapping can reduce runoff estimates relative to the 1994 soil assumptions where land cover and drainage configuration are otherwise similar. This effect is accounted for through the composite CN calculation. However, future development, increased imperviousness, and changes in drainage connectivity can offset or exceed the reduced runoff potential associated with more permeable mapped soils. Therefore, Future Conditions hydrologic results should be interpreted as the combined effect of future land cover, mapped soil conditions, subcatchment routing assumptions, and proposed drainage infrastructure.

4. The Future Conditions hydrologic model represents planning-level buildout conditions based on General Plan land uses, known future development information, and proposed FCIPs available at the time of this SWMP update. The curve number selected for each land use represents the average planned density of that land use. Future land use changes, more dense development within a land use category, revised development plans, or changes to City design criteria may require future model updates or revisions to the future conditions proposed solutions. Where a future drainage area contains distinct concentrations of planned land uses that materially affect runoff generation or routing, those areas may be represented as separate subcatchments while retaining the same General Plan- and HSG-based CN methodology, as applied for FCIP No. 13.
5. Future subcatchment boundaries are planning-level drainage areas developed to represent anticipated tributary areas to proposed trunk storm drains, storage basins, and outfalls. Final project design should confirm drainage boundaries using detailed grading plans, survey data, and site-specific development layouts.

CHAPTER 5 HYDRAULIC ANALYSIS OF WATERWAYS

This chapter summarizes the planning-level hydraulic evaluation of the City's primary stormwater receiving waterways (Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek) and compares modeled stormwater discharges to available information on historic conveyance.

5.1 Waterway Overview

The City's receiving waterways are largely irrigation conveyances. They are operated under shared-use conditions that can constrain the timing and quantity of stormwater discharge into them, particularly when irrigation or Kaweah-related releases are present. The waterways are described in Chapter 2.

5.2 Modeling Approach

Modeling and analysis of the City's waterways was performed. The City's stormwater discharges into the waterways were quantified and the channel capacities determined.

Cross-section geometry and representations of roadway crossings/inline structures were utilized to understand the available capacity in the waterways. The waterways were then evaluated on their ability to contain storm flow discharges within their banks.

HEC-RAS was retained for the principal waterways because the available models represent long open-channel corridors using detailed cross sections, roadway crossings, inline structures, and water-surface profiles. This format is well suited to screening where and at what steady-flow magnitude channel banks may be overtopped. Maintaining the separate models (HEC-RAS versus USEPA-SWMM) allowed the study to use the previously developed waterway geometry without reconstructing the full channel corridors in SWMM.

The analysis includes basins that are linked to the waterways that provide off-stream regulation and storage of peak flows. Capturing and retaining stormwater discharges in off-stream storage basins can maintain channel capacity for peak flows downstream.

HEC-RAS models were built for Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek.

The HEC-RAS models were built using the City-provided topographic data. In some locations ponded water or vegetation hindered the accuracy of the LiDAR data; the topographic data was adjusted in these areas. Manning's n roughness values were assigned as 0.022 for the earthen channels, 0.033 for rock-lined areas, and 0.015 for culverts.

Additional waterways were analyzed using the FHWA Hydraulic Toolbox software and include North Mill Creek and Persian/Watson Ditches.

The modeled ditches and creeks are shown in Figure 5.1.

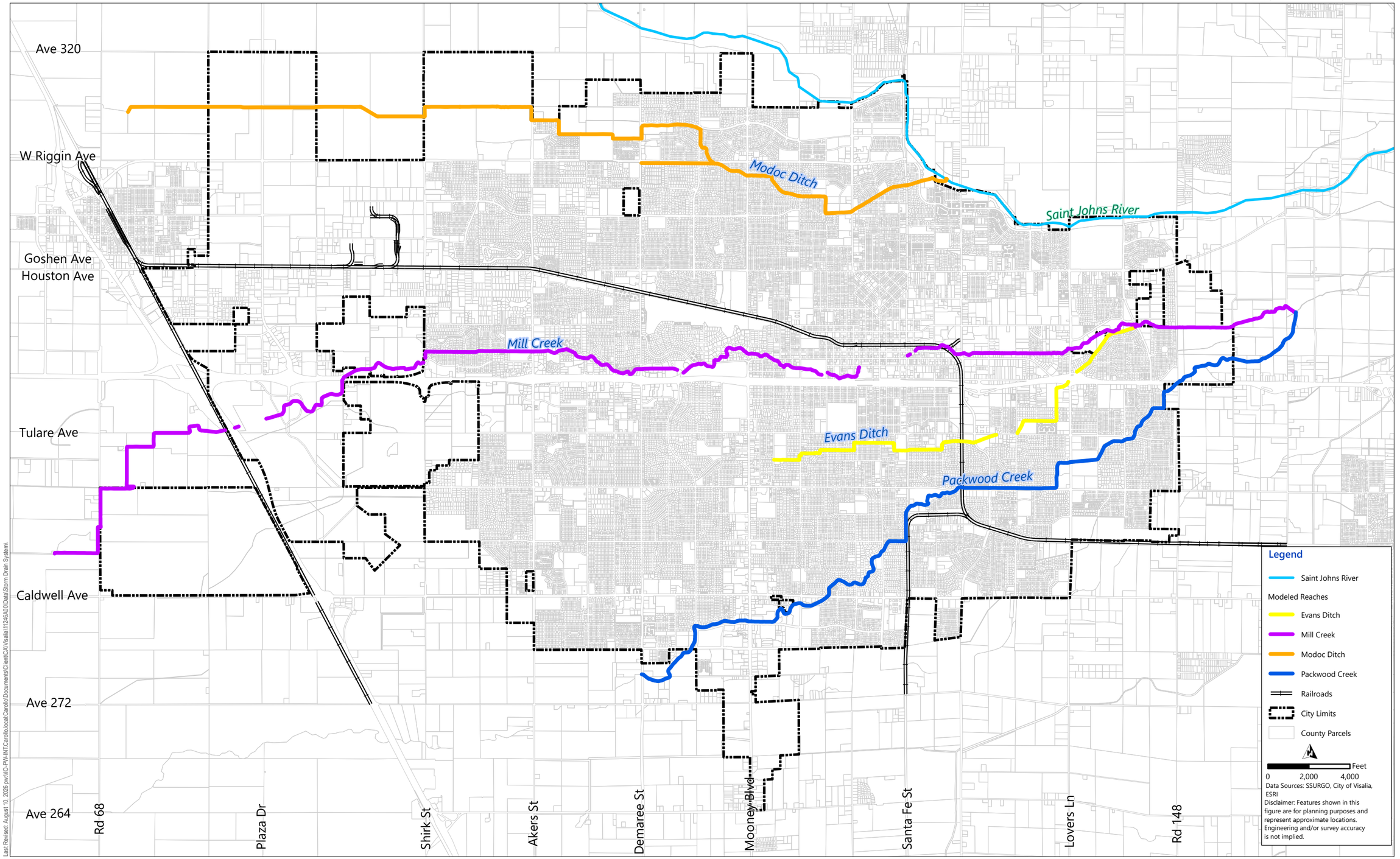

Figure 5.1 HEC-RAS Modeled Reaches
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5.3 Major Drainage System Inflows

The locations of existing outfalls, including pumped flows, and storage basins along each of the channels were considered in the analysis. A summary of the number of modeled outfalls, outfalls that are pumped flows, and storage basins located in proximity to each channel is provided in Table 5.1. Figure 5.2 shows the locations for Modoc Ditch, Figure 5.3 shows the locations for Mill Creek, Figure 5.4 shows the locations for Evans Ditch, and Figure 5.5 shows the locations for Packwood Creek.

Table 5.1 Outfalls and Storage Basins along Waterways

Waterway	Total Modeled Outfalls	Outfalls with Pumped Flows	Storage Basins
Modoc Ditch	16	6	6
Mill Creek	37	12	10
Evans Ditch	10	7	3
Packwood Creek	37	9	9

Both pumped and gravity discharges from the storm drain system enter the ditches and creeks. To understand the inflows into the waterways, the peak flows from the outfalls from the minor drainage system along each ditch and creek were calculated for the Existing Conditions and Future Conditions storm events.

For each waterway, the modeled gravity and pumped outfall discharges were summed at each SWMM reporting timestep, and the maximum combined value was selected as a planning-level screening flow. Because the outfalls are distributed along each waterway, the summed peak does not represent a single measured or modeled flow at one cross-section. It is used to compare the general magnitude of City stormwater discharges with the planning-level waterway capacity ranges. This evaluation was conducted for both Existing and Future Conditions. The selected peak flow values from the Existing Conditions are summarized in Table 5.2. The maximum historic flow for each waterway is also included in the table.

Table 5.2 Existing Conditions Stormwater Outfall Peak Flows

Waterway	Maximum Historic Flow (2000-2019) (cfs)	Existing Conditions (cfs)
Modoc Ditch	86	120
Mill Creek	169	600
Evans Ditch	50	100
Packwood Creek	300	320

The modeled values are not directly comparable with the historic maximums because the historic values represent observed operational flows, whereas the modeled values are summed planning-level outfall peaks under the specified design storm. The values are used as screening inputs for the waterway evaluation described in Section 5.4.

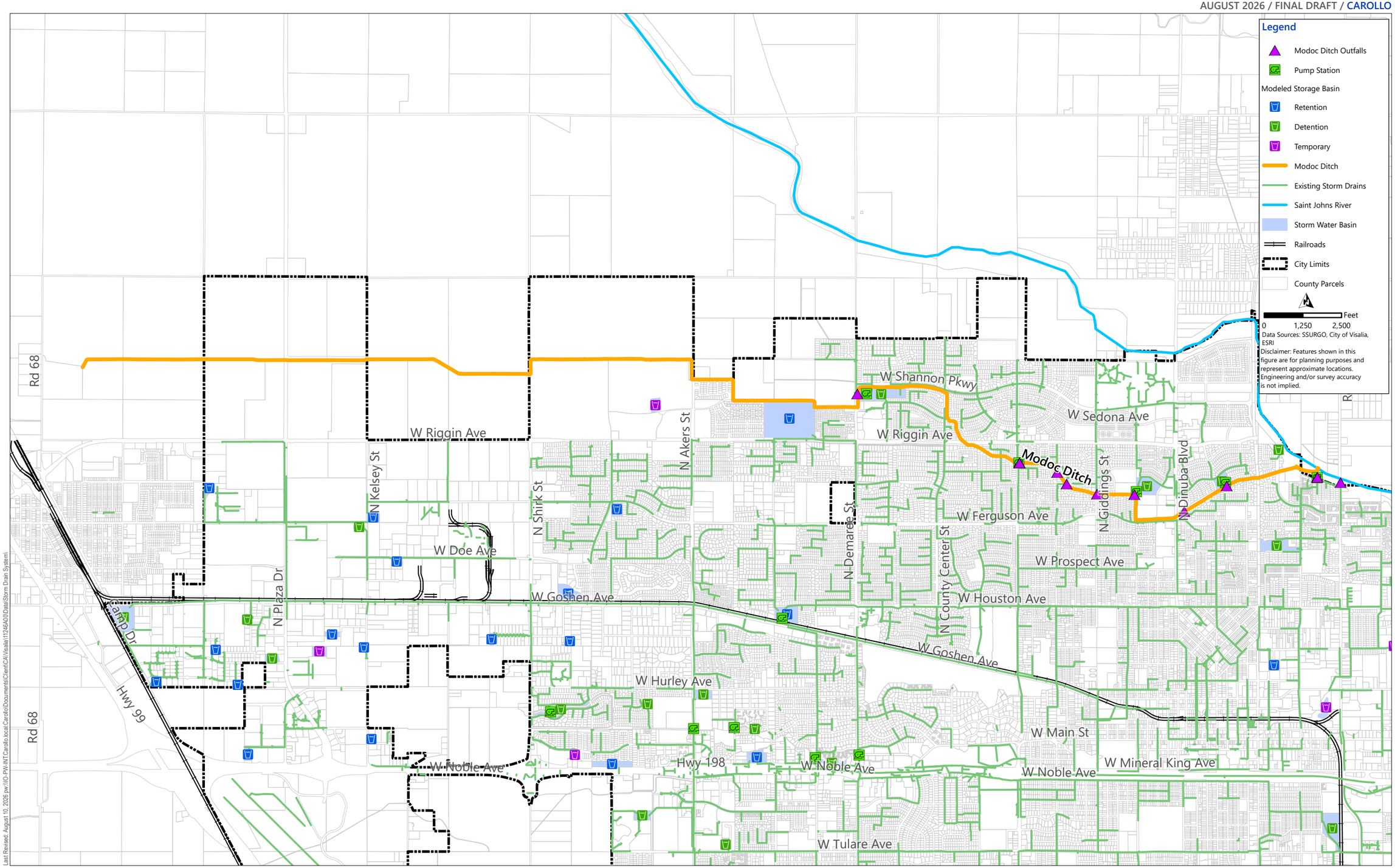

Figure 5.2 Modoc Ditch Outfalls and Nearby Storage Basins
CITY OF VISALIA, CA
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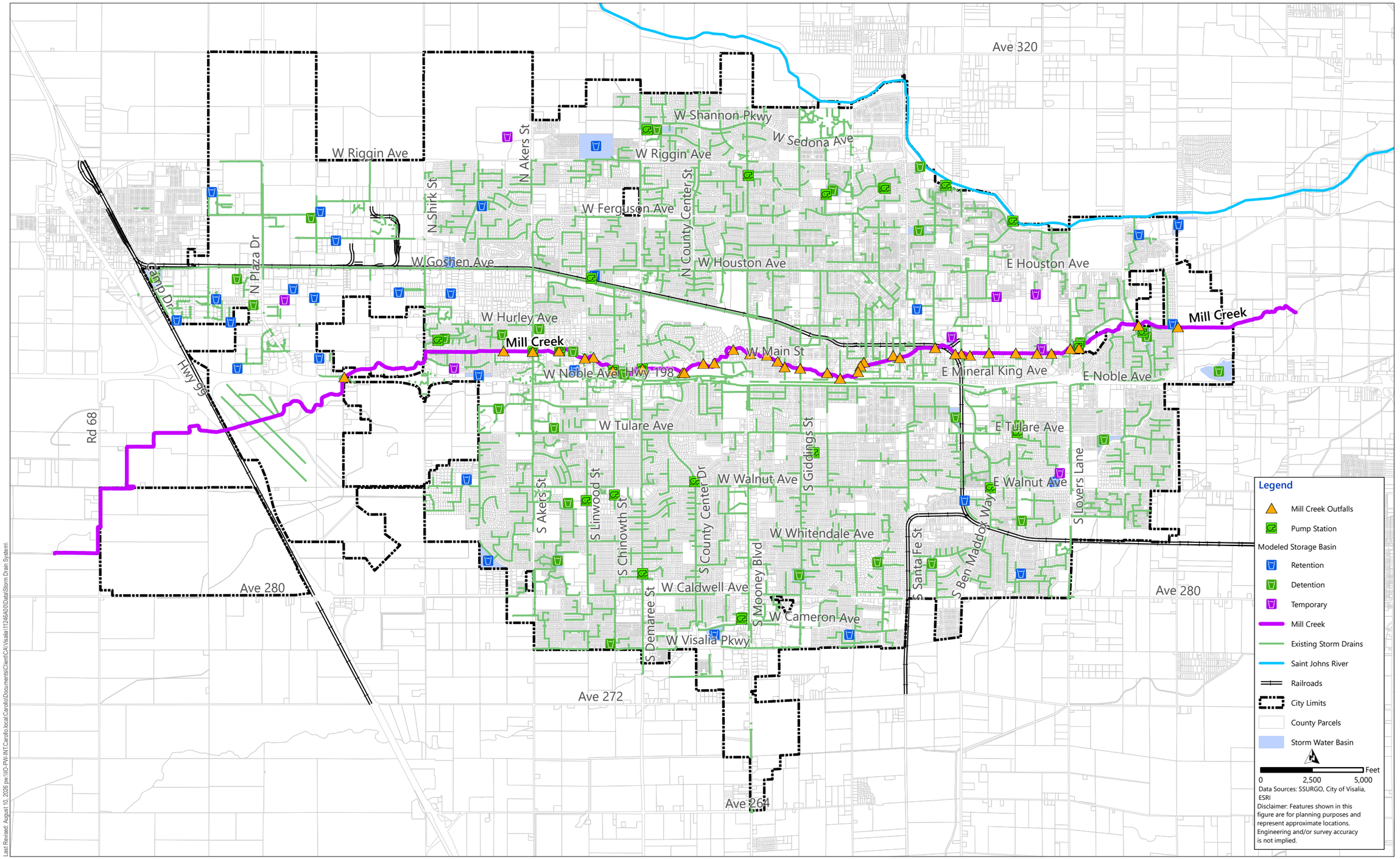

Figure 5.3 Mill Creek Outfalls and Nearby Storage Basins

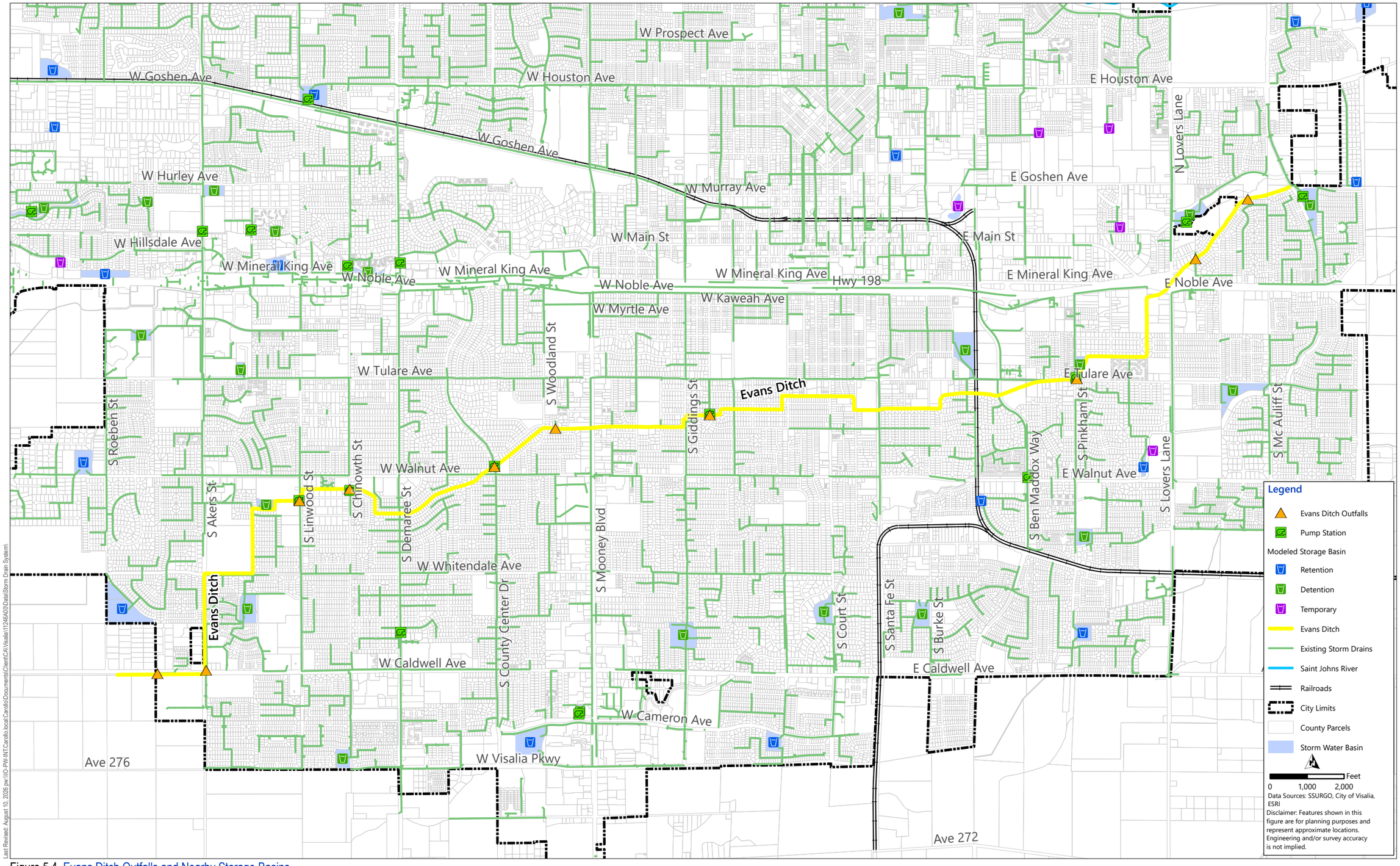

Figure 5.4 Evans Ditch Outfalls and Nearby Storage Basins

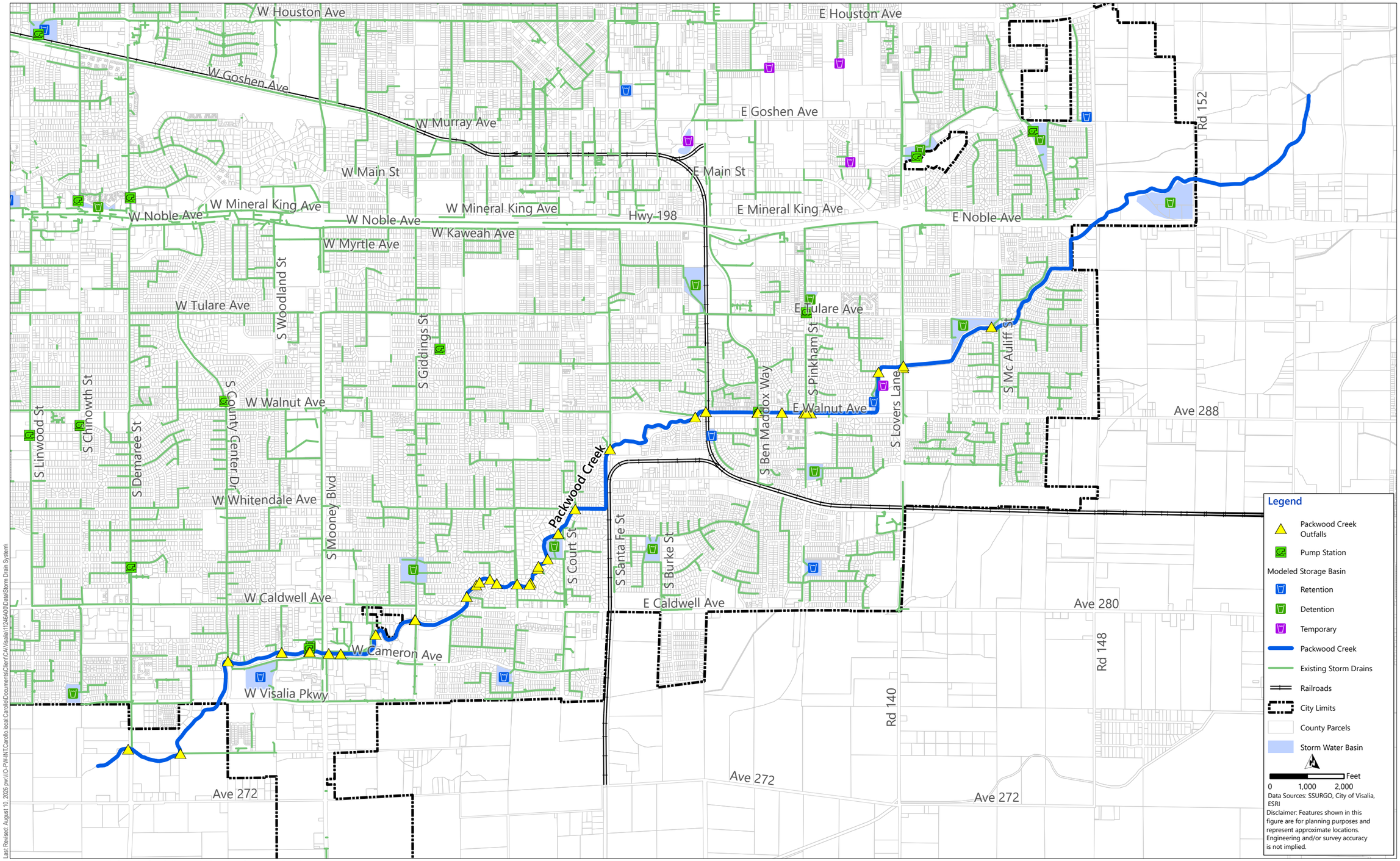

Figure 5.5 Packwood Creek Outfalls and Nearby Storage Basins
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Future Conditions inflows to the major drainage system were evaluated using the final Future Conditions SWMM model with proposed FCIPs included. The modeled Future Conditions outfall flows include gravity and pumped discharges from the future storm drain system to the City's receiving waterways.

The Future Conditions outfall flows were used to evaluate how planned development and proposed improvements may change discharges to Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek. The flow values are planning-level values and are intended to support comparison of future discharge conditions to available waterway capacity information.

The peak flows summarized in Table 5.3 represent the maximum modeled outfall discharge to each waterway during the Future Conditions design storm.

Table 5.3 Future Conditions Stormwater Outfall Peak Flows

Waterway	Maximum Historic Flow (2000-2019) (cfs)	Future Conditions (cfs)
Modoc Ditch	86	150
Mill Creek	169	1,140
Evans Ditch	50	140
Packwood Creek	300	1,060

The Future Conditions peak flow value shown in Table 5.3 are higher than the Existing Conditions peak flow values shown in Table 5.2. There are three main reasons for this:

1. The design storms used for Existing Conditions and Future Conditions are different. The Future Conditions storm provides less recovery time between events and therefore generates more runoff.
2. The additional, projected, future development is included in Future Conditions. Because future development will likely result in more impervious areas and more efficient conveyance systems, the peak flows are expected to increase.
3. The Future Conditions values represent the maximum combined discharge from all modeled gravity and pumped outfalls, including existing developed areas, existing and proposed drainage facilities, controlled basin releases, and revised tributary routing.

Modeling indicates the proposed retention basins reduce or eliminate downstream discharge from the areas discharging to them. Table 5.3 represents the overall system response under the Future Conditions design storm.

5.4 Channel Capacity Analysis

Once the peak discharges to the channels were calculated, the channel capacities were evaluated.

Channel capacities were determined differently based on if the channel is evaluated in HEC-RAS or the FHWA Hydraulic Toolbox.

5.4.1 HEC-RAS

HEC-RAS steady-flow models were used to evaluate the planning-level capacity of Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek. These simulations are hydraulic capacity-screening runs and are not independently assigned a storm recurrence interval.

Steady flow files were created for each waterway. Table 5.4 shows the values used in the steady flow files including summed peak flow outfall flow from the previous section, the low end of the range, and the high end of the range. Table 5.4 identifies the profile corresponding to the summed Existing Conditions peak outfall flow described in Section 5.3, together with the profiles selected as the lower and upper ends of the reported planning-level capacity range.

Table 5.4 Steady-Flow Profile Values

Waterway	Existing Conditions (cfs)	Low End of Range (cfs)	High End of Range (cfs)
Modoc Ditch	120	50	250
Mill Creek	600	100	600
Evans Ditch	100	50	200
Packwood Creek	320	150	400

The low end of the range identifies the flow rates at which channel-bank overtopping begin for any cross section long the waterway. The high end of the range identifies where the last cross sections begin to overtop. The high end represents conditions where overtopping occurs at a majority of the modeled cross sections.

5.4.2 Federal Highway Administration Hydraulic Toolbox

For North Mill Creek and the Persian/Watson Ditches, the FHWA Hydraulic Toolbox was used. Flow rates were iterated until overtopping began.

5.5 Channel Capacity Results

The HEC-RAS modeling analysis results for the Modoc Ditch, Mill Creek, Evans Ditch, and Packwood Creek are presented in the following subsections. The Hydraulic Toolbox results are also included for North Mill Creek and Persian/Watson Ditches.

For each section, the results from the 1994 SWMP are included for ease of comparison. It is important to note that the 1994 SWMP used a simplified Manning's equation analysis based on a Manning's n value of 0.030 and a slope of 0.001. This is a different hydraulic approach for this study where a more detailed planning-level HEC-RAS model and the FHWA Hydraulic Toolbox are used.

5.5.1 Modoc Ditch

Modoc Ditch was modeled as three segments. The first segment starts upstream at the divergence from St. John's River, ends at the split at Riggin Avenue, and is 13,275 feet long. The second segment continues from Riggin Avenue northwestward across the City and is 32,755 feet long. The third segment continues from the split along Riggin Avenue and is 3,540 feet long.

There are 1,012 cross sections spaced approximately every 50 feet along the three segments, and 31 roadway crossings and four inline structures modeled. Survey data was unavailable for the culverts, and therefore invert elevations and slopes were estimated based on the topography and may not represent observed field conditions.

The 1994 SWMP estimated the capacity of Modoc Ditch to range from 154 to 674 cfs. The HEC-RAS steady-flow results produced an updated range of approximately 50 to 250 cfs.

Bank overtopping was observed upstream of culverts and roadway crossings, and further study may be necessary to determine if undersized culverts are present and need to be upsized for additional capacity in Modoc Ditch.

The lower updated range primarily reflects the more detailed representation of channel geometry, backwater, and localized hydraulic controls that were not represented in the simplified 1994 analysis; it does not, by itself, demonstrate that the physical capacity of the ditch has declined since 1994.

Because field survey information was unavailable for the culverts and some invert elevations and slopes were estimated from available topography, additional survey and hydraulic evaluation would be required before recommending improvements to specific crossings.

5.5.2 Mill Creek

Mill Creek was modeled as nine segments, which were split by culverts longer than 200 feet that were unable to be modeled correctly in HEC-RAS due to model computation constraints. The nine segments, in total, are 68,125 feet long.

There are 1,404 cross sections spaced approximately every 50 feet along the nine segments, with 55 roadway crossings and two inline structures modeled. Survey data was unavailable for most of the modeled culverts, and therefore invert elevations and slopes were estimated based on the topography and may not represent observed field conditions.

The 1994 SWMP determined the channel capacity ranges from 147 to 1,169 cfs, while this study found the range to be 100 to 600 cfs.

The main channel capacity bottleneck sections are in the City. There are significant channel expansion constraints, especially through the established residential areas between Mooney and Akers Streets.

The highest capacities were observed between the split with Kaweah River and split with Evans Ditch. Bank overtopping was observed upstream of culverts and roadway crossings, and further study may be necessary to determine if undersized culverts are present and need to be upsized for additional capacity in Mill Creek.

5.5.3 Evans Ditch

Evans Ditch was modeled as four segments, which were split by culverts longer than 200 feet that were unable to be modeled correctly in HEC-RAS due to computational model constraints. The four segments, in total, are 34,200 feet long.

There are 695 cross sections spaced approximately every 50 feet along the four segments, with 33 roadway crossings and one inline structure modeled. Survey data was unavailable for most of the

culverts, and therefore invert elevations and slopes were estimated based on the topography and may not represent observed field conditions.

The 1994 SWMP estimated the capacity of Evans Ditch to range from 140 to 277 cfs. The HEC-RAS steady-flow results produced an updated range of approximately 50 to 200 cfs. The highest capacity was observed in the downstream segment along Caldwell Avenue.

The lower updated range reflects the more detailed representation of channel geometry, roadway crossings, backwater, and localized hydraulic controls and does not necessarily indicate that the physical capacity of Evans Ditch has decreased since 1994.

There are limited expansion capabilities because most of the land along the channel is developed within the City limits.

5.5.4 Packwood Creek

Packwood Creek is modeled as one reach that is 42,740 feet long.

There are 197 cross sections spaced approximately every 200 feet along the reach, with 24 roadway crossings and six inline structures modeled. Survey data was unavailable for some of the culverts, and therefore invert elevations and slopes were estimated based on the topography and may not represent observed field conditions.

The 1994 SWMP estimated the capacity of Packwood Creek to range from 515 to 1,477 cfs. The HEC-RAS steady-flow results produced an updated range of approximately 150 to 400 cfs. The highest capacity was observed near Road 128.

The lower updated range primarily reflects the more detailed representation of channel geometry and localized hydraulic controls and does not necessarily indicate that the physical capacity of Packwood Creek has decreased since 1994.

Survey information was unavailable for some culverts; therefore, their invert elevations and slopes were estimated from available topographic information, and additional field survey and hydraulic analysis would be needed to confirm the capacity of specific crossings.

5.5.5 North Mill Creek

North Mill Creek mainly functions to divert high flows from Mill Creek when capacity has been reached. FHWA Hydraulic Toolbox software was used to estimate the maximum flow in North Mill Creek to be approximately 200 cfs.

5.5.6 Persian/Watson Ditches

The Persian/Watson Ditches are irrigation conveyance facilities that, as a secondary function, provide a stormwater and high-flow diversion function from Mill Creek when capacity is reached. The system includes one main channel and four bifurcated channels. FHWA Hydraulic Toolbox software was used to confirm the flow ranges in the five channels that were specified in the 1994 SWMP.

Channel capacity varies from 70 to 230 cfs. According to the 1994 SWMP, the maximum flood flow at the headgate is approximately 97 cfs, and the maximum winter entitlement flow is 99 cfs.

There is potential to expand the channel since the adjacent land is mostly undeveloped.

Table 5.5 shows the estimated flow capacity for the Persian/Watson Ditches.

Table 5.5 Persian/Watson Ditches

Channel	Estimated Flow Capacity (cfs)
Persian-Watson Ditch	120-230
North Fork Persian Ditch	100
Middle Fork Persian Ditch	70
Watson Ditch	130
Watson/South Branch Persian Ditch	150

Table 5.6 summarizes the estimated flow capacity for the waterways and includes the historic maximum flow.

Table 5.6 Estimated Flow Capacity for the Waterways and the Historic Maximum Flow

Waterway	Maximum Historic Flow (2000-2019) (cfs)	1994 SWMP Range	2026 SWMP Range
Modoc Ditch	86	154-674	50-250
Mill Creek	169	147-1,169	100-600
Evans Ditch	50	140-277	50-200
Packwood Creek	300	515-1,477	150-400

The modeling results indicate the channel carrying capacity is likely less than the peak flows being discharged into them. As such, increasing peak flows from the City's minor drainage system may exacerbate channel capacity issues downstream. This finding further supports the City's stormwater management approach of limiting discharges from its system.

5.6 Assumptions and Limitations

The following section describes the specific assumptions and limitations regarding this section:

1. The comparison between summed outfall discharges and waterway capacity is inherently uncertain. Outfalls are distributed in space and time, and travel time, attenuation, and channel storage can prevent the summed peak from occurring at a single cross-section. Actual performance may also be controlled by localized restrictions, culverts, maintenance condition, vegetation, sediment, tailwater, and concurrent irrigation or flood-control flows. Accordingly, the summed outfall peak is a planning-level screening metric, not a deterministic prediction of exceedance at a specific location. The data utilized for the hydraulic capacity evaluation of the waterways is considered planning level; no field survey was conducted. Feasibility studies should be conducted prior to final design.
2. The City's minor and major drainage systems interact highly with each other. To understand the magnitude of interaction, the Modoc Ditch was added to the USEPA-SWMM minor drainage system model. Based on the results of this addition, it is recommended that future SWMP updates incorporate all waterways into the minor drainage system model.

3. The Future Conditions outfall flow values are based on the final Future Conditions SWMM model and represent planning-level peak discharges from the modeled storm drain system to the receiving waterways. These values are appropriate for master planning and capital improvement screening but should not be used as final design discharges without project-specific confirmation.
4. The waterway hydraulic analysis relies on City-provided 2006 LiDAR and available cross-section information developed during previous planning efforts. In some locations, ponded water or vegetation affected the LiDAR surface, and the topographic data were adjusted in those areas. No new field survey or replacement terrain model was incorporated as part of this SWMP update. Accordingly, the results are appropriate for planning-level evaluation, and current channel and crossing survey data should be obtained before project-specific design or detailed capacity analysis.
5. Future Conditions discharge assumptions should be revisited as development occurs, as drainage areas are refined, and as final designs for FCIPs are prepared.

CHAPTER 6 HYDRAULIC ANALYSIS OF INTERIOR DRAINAGE SYSTEM

This chapter summarizes the planning-level hydraulic evaluation of the City's interior, or minor drainage system (storm drains, storage basins, and pumps) and compares modeled results to anecdotal information reported on system deficiencies. Both existing conditions and future conditions are described.

6.1 Modeling Objectives

Modeling and analysis of the City's existing conditions and future conditions stormwater basins, pumps, and pipe network were performed. This modeling and analysis effort had three main objectives:

1. The first was to identify capacity deficiencies of the existing basins, pumps and pipe network based on existing development.
2. The second was to identify capacity deficiencies of the existing basins, pumps, and pipe network based on adding future development occurring per the General Plan that would impact the existing facilities.
3. The third was to plan for the future basins and pipe network to serve future growth areas within the City.

6.2 Current and Previous SWMP Modeling Approach

6.2.1 1994 SWMP

The 1994 master plan modeling approach differed from the present approach in that it relied on HEC-1 for hydrologic computations and a kinematic wave approach for flow routing, while capacity evaluation for portions of the conveyance system was performed using Manning's equation methods. The kinematic wave method assumes the water surface slope is approximately equal to the conduit/plane slope and does not represent backwater and pressurization to the same degree as dynamic wave routing.

6.2.2 Current SWMP

The modeling for this SWMP was conducted using USEPA-SWMM Version 5.2.4. The USEPA-SWMM model used the dynamic wave equations, which can represent pressurized flow, flow reversal, and non-dendritic layouts. The dynamic wave equations require more computational time and smaller time steps for numerical stability than the kinematic wave equations.

The hydrologic analysis component of USEPA-SWMM was described in Section 4. The runoff from the hydrologic analysis enters the basins, pumps, and pipe network model components through the model's hydrology layer.

Hydraulic routing within the basin–pump–pipe network model performed using EPA SWMM dynamic wave routing, solves the full one-dimensional Saint-Venant equations and can represent conditions relevant to urban drainage systems including surcharged/pressurized flow, backwater effects, flow reversal, and non-dendritic network layouts. This capability is particularly important in relatively flat terrain and in systems with pump stations and interconnected trunk lines where hydraulic grade line (HGL) interactions can control system performance. For this SWMP, dynamic wave routing is used because it is better suited to represent the operational and hydraulic controls present in the City's storm drain system (including pumped discharge constraints and non-dendritic connectivity).

6.3 Existing Conditions Model Components

As described previously, the City's minor drainage system is made of storm drainpipes, pump stations, and storage basins. The existing conditions model update utilized the 2005 stormwater model as a starting point.

The 2005 model was compared to the City's most recently updated GIS data to find missing pipes, pumps, and storage basins as follows:

- **Storm Drainpipes:** The 30-inch and greater diameter storm drainpipes installed since the 2005 model were identified. As-built drawings for these pipes were acquired from the City, and the missing pipes were added to the Existing Conditions model.

  Standard circular storm drain conduits were generally modeled using a Manning's roughness coefficient of $n = 0.013$, representative of RCP. Different roughness coefficients were retained where they were present in the City-provided baseline model or where model elements represented other materials like open channels, bioswales, or overland-flow pathways.
- **Pump Stations:** A list of currently operated pumps, pump flow data, pump on and off elevations, and available rating curves were acquired from the City. The Existing Conditions model was updated with this most recent pump information.
- **Storage Basins:** Storage basins implemented since the 2005 model were identified. Stage-storage curves and elevation data were received from the City for these storage basins. Additionally, basins that were included in the 2005 stormwater model, but that were significantly altered since, were also identified and updated.
- **Dividers:** The 2005 stormwater model included dividers, which represent junctions with divided flow. The dynamic wave equations used in the 2023 model update do not require junctions to be specifically defined as dividers to model divided flow. Therefore, new dividers were not added to the model, while the 2005 dividers were retained.

Table 6.1 contains a summary of 2005 stormwater model components and the current model components. Figure 6.1 shows the Existing Conditions model components.

Table 6.1 Summary of Existing Conditions Model Update

Model Component	2005 Model	Updated Existing Conditions Model
Subcatchments	451 subcatchments	708 subcatchments
	18,698 acres	19,357 acres
Junctions and Dividers	528 junctions and dividers	740 junctions and dividers
Pipes	531 conduits	804 conduits
	67.7 miles	78 miles
Outfalls	83 outfalls	130 outfalls
Storage Basins	44 basins	78 basins
Pump Wet Wells	Not modeled	40 wet wells
Pumps	22 pumps	51 pumps

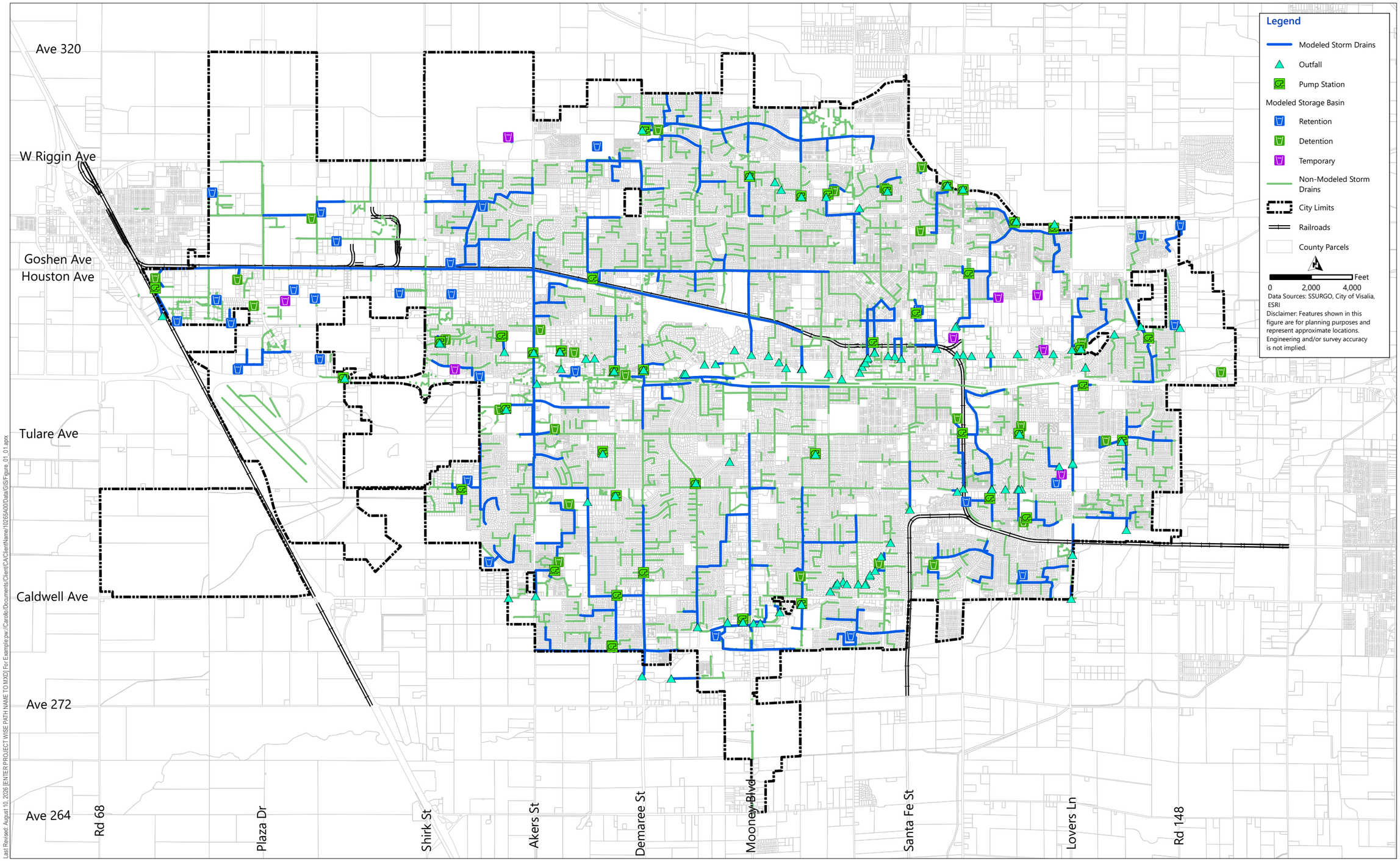

Figure 6.1 Existing Conditions Model Components
CITY OF VISALIA
MASTER PLANS AND FINANCIAL NEXUS STUDY

6.3.1.1 Storage Basins

Storage basins are represented in USEPA-SWMM using storage nodes with basin-specific stage-storage curves. Basin inverts, crest elevations, and outlet structures control the routing of inflows through basin storage and into downstream conveyance or pumped discharge facilities. Stage-storage relationships were developed using City-provided basin data. Chapter 2 lists the storage basins included in the model.

6.3.1.2 Pumps

Pump stations are represented in USEPA-SWMM using pump elements with control settings (on/off elevations) and performance characteristics. Pump stations serve as critical control points that regulate discharge to receiving ditches and canals subject to entitlement and operational constraints. Chapter 2 lists the pump stations included in the model.

6.3.1.3 Pipe Network

Chapter 2 summarizes the storm drain contained in the City's GIS data for all storm drain. The modeled pipe network includes trunk and major conveyance infrastructure used for master planning evaluations (pipes 30-inches or greater). Table 6.1 summarizes the portion of the City's system included in this SWMP model.

6.3.1.4 Overland Flow/Ponding

The purpose of this modeling is to understand the capacity of the stormwater management infrastructure, generally defined as the pipes, pump stations, and storage basins. Overland flow areas, such as streets and other overland flow paths, are not included.

However, when the capacity of the defined system is exceeded in the model, the stormwater will surcharge the modeled system. If the areas where the stormwater can surcharge to are not defined, that stormwater will be lost from the system (it does not get stored by default to reenter the defined system).

For this SWMP model, these overland locations were defined by creating ponded areas at the model junctions. The ponded area was approximated using the street ROW area associated with the tributary subcatchment.

Where mapped ROW information was available, the corresponding ROW area was used to represent surface ponding at the receiving junction. Where no direct tributary subcatchment or other representative surface-storage area was available, a nominal ponded area of 100 square feet was generally assigned so that surcharged flow would be retained within the model and could reenter the drainage system as capacity became available. Project-specific values were retained where more representative ponding or routing information was available.

Tables summarizing the Existing Conditions model hydraulic parameters can be found in Appendix E.

6.4 Existing Conditions Model Results

The Existing Conditions storm event (3 2-year, 24-hour storm events spaced 6 days apart) was executed in the model. The model results were reviewed with City staff. Where the model results did not seem to match anecdotal information, the model inputs were revised. Once the modeling was complete, the results were compared to the City's criteria described in Chapter 3.

Figure 6.2 shows the existing conditions HGL results for each junction. Figure 6.3 shows the existing conditions HGL results for each storage basin. Orange and red symbols identify locations where the modeled water level exceeds the City's screening criteria, with red representing a longer-duration exceedance than orange.

These symbols are screening flags and do not automatically mean that flooding has been observed at the location or that a separate capital project is required. Some flagged locations represent pressure within a closed pipe, localized or short-duration ponding, simplified assumptions used to represent surface storage, or conditions associated with another system constraint.

The flagged results were reviewed considering the modeled depth and duration, the representation of surface ponding area, the physical function of the modeled node, hydraulic connectivity, available City operations and maintenance information, and whether the condition was addressed through an identified capital improvement. Appendix F lists the flagged junctions and storage nodes and documents the resulting findings.

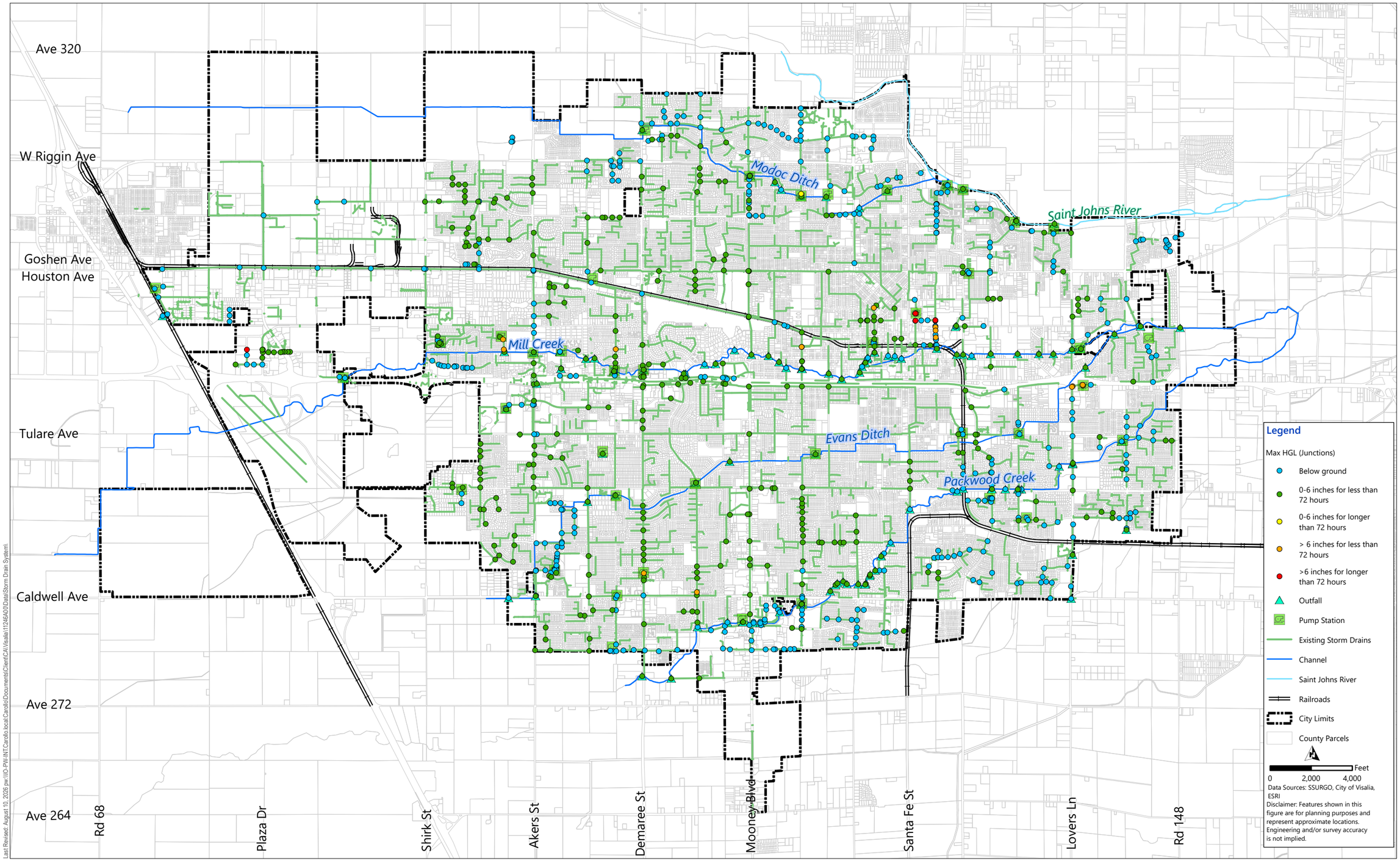

Figure 6.2 Existing Conditions Maximum Junction HGL Results
CITY OF VISALIA, CA
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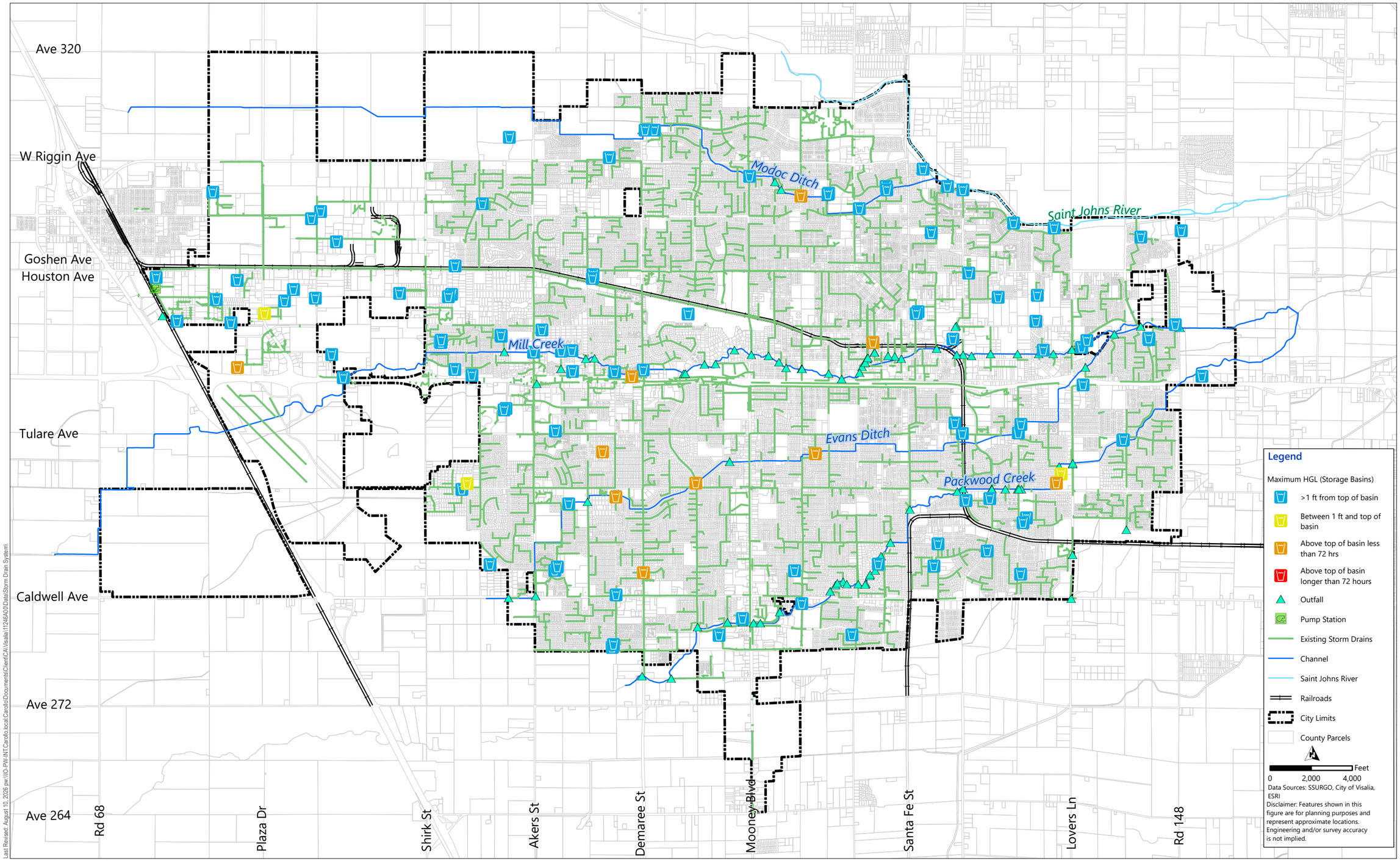

Figure 6.3 Existing Conditions Maximum Storage HGL Results
CITY OF VISALIA, CA
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Overall, the City's system generally performs in a manner consistent with the City's historical expectations, except for three priority areas identified by City operations and maintenance staff:

- **Area 1:** The intersection of South County Center Drive and West Walnut Avenue experiences flooding during storm events due to insufficient wet well capacity and the absence of an overflow outlet to Evans Ditch. This condition is not fully reflected in the model because the flooding mechanism is controlled by localized wet well/sump storage and the lack of an emergency overflow path, rather than a larger trunk storm drain capacity deficiency represented at the master planning model scale.
- **Area 2:** A pipe size reduction along North McAuliff Street causes recurring debris blockages and approximately 6 inches of flooding at the intersection of Houston Avenue and McAuliff Street, a major roadway corridor. This area is not shown in the modeling results as this system is not included in the modeling; the diameter of the storm pipe is less than the minimum diameter included in the model.
- **Area 3:** The Kiwanis Park Basin and wet well system require improvements to the hydraulic connection between the existing storage basin and downstream wet well. The improvement includes lowering or replacing the connection pipe and modifying or deepening the existing wet well so the basin can drain more effectively and better use its available storage volume.

The recommendations for these areas are described in Chapter 8.

6.5 Future Conditions Model Components

The Future Conditions model builds on the Existing Conditions model and incorporates General Plan buildout, known future development areas, revised future drainage areas, planned trunk storm drain infrastructure, future storage facilities, and the FCIPs developed as part of this SWMP. The Future Conditions model is intended to evaluate the long-term drainage infrastructure needed to serve future growth while remaining consistent with the City's storage-first and controlled-discharge stormwater management strategy.

The future conditions model components were developed as follows:

- **Storage Basins:** Future storage facilities are represented in USEPA-SWMM using storage nodes with conceptual stage-storage curves consistent with planning-level facility footprints and assumed design depths. For proposed facilities, City standards specify that infiltration should not be credited in basin sizing. Therefore, infiltration/seepage is set to zero (or seepage is not allowed) in the future conditions model.

  Previous planning included a combined "park-basin" concept and represented the park turf portion as a shallow storage component (including freeboard). However, updated City direction indicates the combined park-basin approach is no longer applicable. The current intent is to implement regional facilities as standalone retention basins.

  Conceptual sizing for this storage basins includes order-of-magnitude geometry such as approximately 23 feet of total depth, 18 feet of water depth, and conservative freeboard allowances.
- **Pumps:** Future pump stations are included where gravity discharge is not feasible and where discharge to receiving facilities must be regulated. Pump station representation follows the same methodology as existing conditions, with conceptual pump controls and capacities aligned with the planned basin operating range and downstream entitlement/receiving constraints.

- **Pipe Network:** Future trunk conveyance is represented as conduits sized for master plan performance under the future conditions screening storm. Pipes included in Future Conditions assume each pipe is at least 18 inches in diameter to account for maintenance/reduce future clogging. Pipe slopes are also entered with an assumed minimum slope of 0.001 feet/feet unless project-specific conditions require a different configuration. Final pipe size, slope, cover, alignment, and tie-in elevations should be confirmed during project-specific design.
- **Overland Flow/Ponding:** The Future Conditions model applies the same general ponding approach used for Existing Conditions. For future tributary subcatchments where mapped existing street ROW was not available, the ponded area at the receiving junction was generally estimated as 23.88 percent of the tributary subcatchment area. This percentage represents the average ROW proportion developed from a geospatial review of existing modeled subcatchments. Where mapped ROW or more representative project-specific information was available, that information was used instead. Where no direct tributary subcatchment or other representative surface-storage area was available, a nominal ponded area of 100 square feet was generally assigned, subject to project-specific exceptions. These ponded areas are planning-level representations used to retain surcharged flow in the model and do not represent surveyed street-storage limits or detailed grading conditions.
- **Outfalls and Tie-ins:** Future outfalls and tie-ins were modeled to represent anticipated discharge points from future development areas and proposed FCIP infrastructure. Where future improvements connect to existing infrastructure, existing elevations, downstream capacity, and receiving constraints may limit the ability to fully eliminate local surcharge or ponding. These constraints are considered part of the planning-level evaluation and should be refined during final design.

Table 6.2 contains a summary of 2005 stormwater model components and Future Conditions model components. Figure 6.4 shows the Future Conditions model components. Tables showing the Future Conditions model hydraulic parameters can be found in Appendix G.

Table 6.2 Summary of Future Conditions Model Update

Model Component	2005 Model	Future Conditions Model
Subcatchments	451 subcatchments	881 subcatchments
	18,698 acres	26,734 acres
Junctions and Dividers	528 junctions and dividers	929 junctions and dividers
Pipes	531 conduits	1007 conduits
	67.7 miles	114 miles
Outfalls	83 outfalls	126 outfalls
Storage Basins	44 basins	105 basins
Pump Wet Wells	Not modeled	40 wet wells
Pumps	22 pumps	52 pumps

6.6 Future Conditions Model Results

The Future Conditions model was evaluated using the Future Conditions design storm described in Chapter 4. The model incorporates General Plan buildout, known future development areas, revised future drainage areas, proposed future trunk conveyance, future storage facilities, and the FCIPs developed as part of this SWMP.

Future Conditions model results were reviewed using the criteria described in Chapter 3, including modeled flooding depth and flooding duration at junctions and available freeboard or maximum storage utilization at storage facilities. The results were used to evaluate whether the proposed future storm drain network, storage facilities, pump controls, and tie-ins provide planning-level capacity for future buildout conditions.

Figure 6.5 shows the Future Conditions maximum junction HGL results. Figure 6.6 shows the Future Conditions maximum storage HGL results.

The maximum HGL is the highest modeled water level at each storm drain junction or storage during the Future Conditions design storm after the proposed FCIPs are included. Orange and red symbols identify locations where the modeled water level exceeds the City's screening criteria, with red representing a longer-duration exceedance than orange.

These symbols do not automatically mean that flooding has been observed at the location or that a separate capital project is required. Some flagged locations represent pressure within a closed pipe, localized or short-duration ponding, simplified assumptions used to represent surface storage, constraints at an existing connection, or a condition already addressed as part of a proposed FCIP. Appendix H lists the remaining flagged junctions and documents why each location was or was not carried forward as a separate improvement.

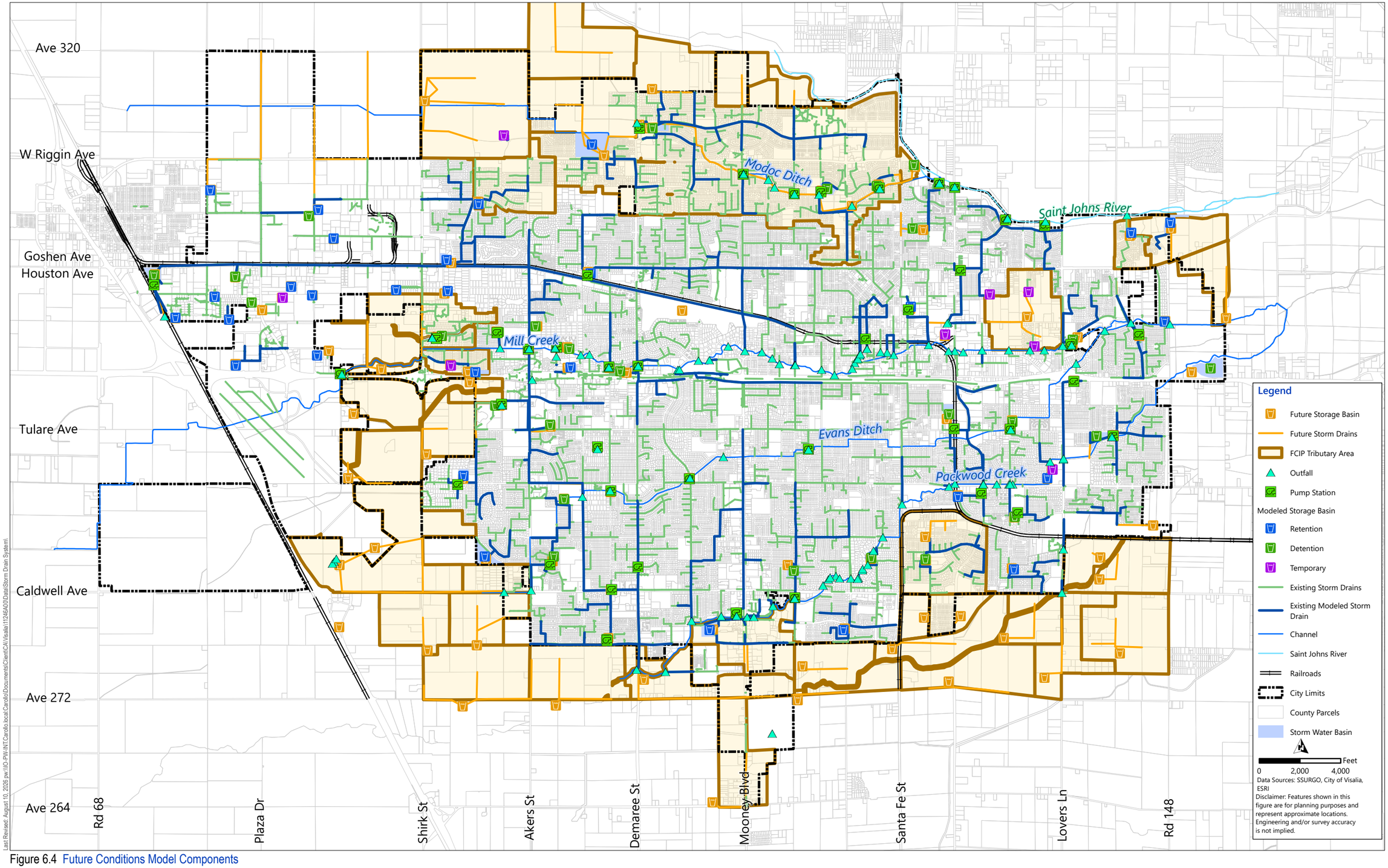

Figure 6.4 Future Conditions Model Components
CITY OF VISALIA
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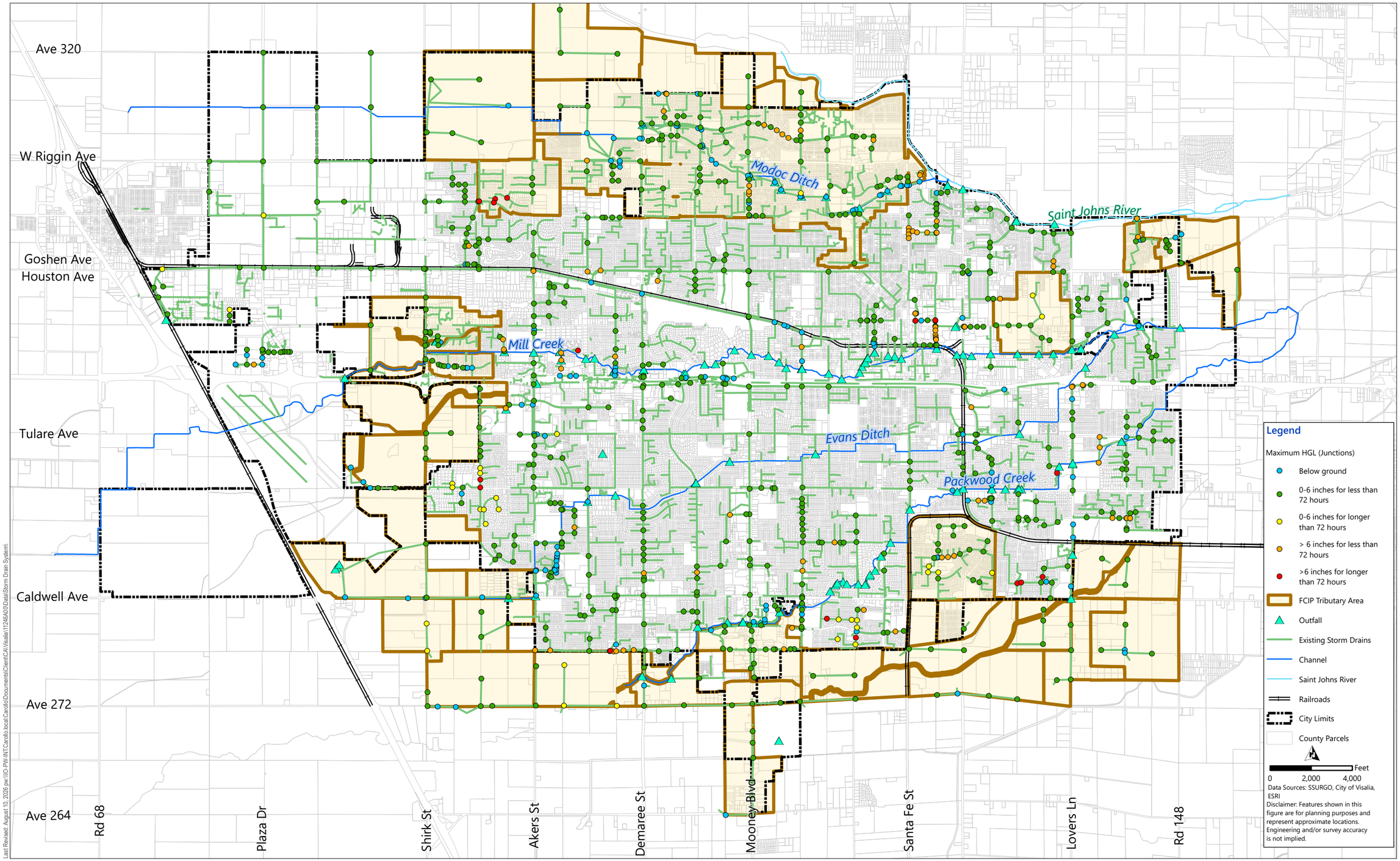


Figure 6.5 Future Conditions Maximum Junction HGL Results
CITY OF VISALIA, CA
MASTER PLANS AND FINANCIAL NEXUS STUDY

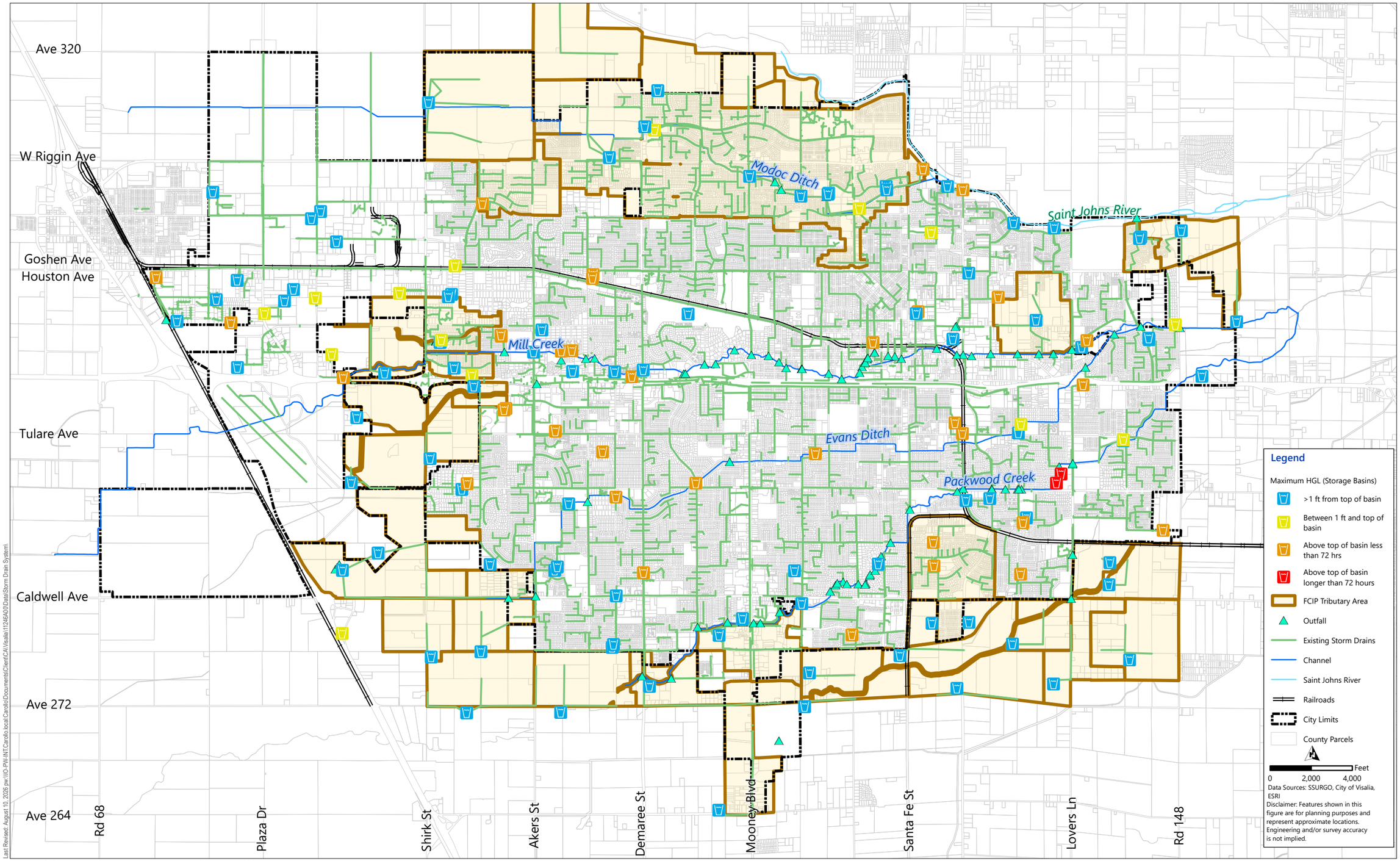


Figure 6.6 Future Conditions Maximum Storage HGL Results
CITY OF VISALIA, CA
MASTER PLANS AND FINANCIAL NEXUS STUDY

6.7 Assumptions and Limitations

The following assumptions and limitations apply to this section:

1. The Existing Conditions screening design storm is intended to reflect the City's contemporaneous conveyance design criteria used for the minor/collector drainage system and to avoid artificially classifying most of the legacy system as deficient. Incoming development has historically been held to a 2-year level of protection for conveyance using the Rational Method, and storage basin sizing practices have relied on Rational Method runoff coefficients.
2. Existing Conditions deficiencies were evaluated using a storm sequence consisting of three 2-year, 24-hour rainfall events spaced six days apart, which provides a total rainfall depth of approximately 4.2 inches while allowing partial soil moisture recovery consistent with SWMM drying time behavior. This event sequence was selected because it produces effective runoff behavior that is closer to the City's adopted Rational coefficients and is considered a reasonable representation of the design criteria used to build much of the existing conveyance system.
3. Some existing storage facilities may have overflow mechanisms that are not explicitly represented in the model; field observations and maintenance history should be used to confirm deficiency status and prioritize improvements.
4. Modeled surface ponding at junctions is based on approximate ponded areas and is intended to represent the relative magnitude of street flooding. The model does not provide detailed two-dimensional overland flow routing, curb-and-gutter spread, inlet interception, or parcel-level flooding analysis.
5. Locations exceeding the screening criteria, or identified through corroborating field observations, should be carried forward into the capital improvement planning process. This approach recognizes that moderate street flooding is expected and has historically been acknowledged in prior master planning; therefore, the deficiency definition focuses on persistent or severe conditions rather than incidental nuisance ponding.
6. The Future Conditions model represents planning-level buildout conditions based on General Plan land uses, known future development information, proposed FCIP infrastructure, and City direction available at the time of this SWMP update. Future changes in land use, development phasing, grading, or drainage standards may require future model updates.
7. The Future Conditions model does not include basin seepage or infiltration for storage sizing unless a project-specific or City-accepted basis was available. Site-specific infiltration or seepage assumptions should be supported by geotechnical information and accepted by the City before being used for final design.
8. Residual modeled flooding or high HGL locations do not automatically indicate that a proposed FCIP is ineffective. These results may reflect existing tie-in constraints, downstream receiving limitations, localized model assumptions, or the City's accepted planning approach that moderate street ponding may occur during the design sequence.
9. The Future Conditions model is intended to support master planning, capital improvement development, and funding/nexus analysis. It is not a substitute for final drainage design, detailed grading design, site-specific hydrologic and hydraulic calculations, utility coordination, or construction-level design.

10. Some model instability may occur near the tail end of storm hydrographs, particularly where flow rates become very small and the modeled system includes very flat or very steep hydraulic grades. This type of late-hydrograph oscillation is a known limitation of SWMM dynamic-wave routing and is generally associated with numerical water-balance behavior at low flows rather than peak-flooding performance. For the FCIP evaluations, isolated instability occurring after the peak runoff period was not used by itself as the basis for increasing pipe size or storage volume. Model results were instead reviewed based on peak hydraulic grade, maximum flood depth, flooding duration, and whether residual street ponding remained within the City's revised acceptable tolerance. Where instability coincided with peak flooding or materially affected flood-depth results, the affected FCIP was reviewed and instabilities were remedied.

CHAPTER 7 STORMWATER MANAGEMENT ALTERNATIVES

Stormwater planning typically distinguishes between a minor (collector) drainage system intended to manage frequent storms with tolerable nuisance flooding and a major drainage system intended to convey larger, less frequent events (e.g., principal open channels and waterways).

A common drainage standard is to limit major damage from larger events and limit nuisance flooding from more frequent events. Within Visalia, relatively flat topography can promote distributed (rather than concentrated) runoff pathways, and the drainage system has historically been planned with an understanding that some moderate street flooding/ponding may occur during storms that exceed minor-system capacity.

A defining constraint for stormwater management in Visalia is that major conveyance pathways are largely comprised of managed creeks/ditches and irrigation facilities, many of which are elevated relative to surrounding land and subject to shared-use agreements and operational constraints. Because downstream receiving capacity is limited and stormwater discharges can coincide with irrigation deliveries and/or flood-control releases, planning alternatives must address not only local conveyance but also timing and throttling of discharges to managed waterways.

7.1 Level of Protection

Visalia's established drainage design criteria are aligned with conveyance sizing for relatively frequent storms. For higher-intensity storms, street ponding is expected until capacity becomes available and/or ponded water migrates along defined overland flow paths. This approach intentionally limits peak discharges from the pipe network to downstream facilities and receiving waterways, which is important given the limited receiving capacity and operational constraints of downstream channels.

The City's relatively flat topography contributes to distributed ponding and localized nuisance flooding, rather than rapidly concentrated, high-velocity flooding. As a result, the controlling considerations at most locations are the extent and duration of street ponding, the protection of structures and critical access routes, and the ability to convey or store runoff without creating downstream impacts. Based on historical and current design practice, much of the City's underground storm drain network is generally consistent with approximately a 2-year level of protection for the minor conveyance system. Higher levels of protection may be present in select corridors where facilities were constructed as trunklines or as part of specific capital projects.

Increasing the level of protection (for example, widespread upsizing of storm drainpipes to convey substantially larger events) can reduce localized street ponding in some locations; however, it can also shift flood risk downstream, increase peak discharge rates to channels and ditches with limited capacity, and require substantial reconstruction of the existing system. Prior master planning efforts recognized that materially increasing the systemwide level of protection has historically been considered cost prohibitive, and that system performance is often governed by downstream receiving limitations and operational controls, not pipe capacity alone.

City staff report the current system performance is meeting their expectations. They do see some nuisance flooding, but, in general, very few areas are in need of improvement.

Given this information, the following is the recommended level-of-protection framework:

1. Maintain minor-system planning consistent with the City's established conveyance design intent, recognizing that street ponding during more intense storms is an expected outcome and must be safely managed via overland pathways.
2. Prioritize targeted conveyance improvements where they provide clear benefit (e.g., critical access routes and repetitive localized flooding locations), while avoiding widespread upsizing that would outpace downstream discharge constraints.
3. Emphasize improvements that increase system resiliency through storage, discharge throttling, and operational coordination with managed waterways, rather than relying solely on pipe conveyance expansion.

7.2 Stormwater Storage

When downstream drains have limited capacity and improvements are not practical due to either limited right of way, aesthetics, protecting riparian habitat, or capital costs, then stormwater storage is the most practical measure for managing runoff. Major advantages of storage include infiltration to recharge groundwater supplies, downstream conveyance systems can have less capacity, water quality can be improved, and sediment can be controlled. Disadvantages include land availability and acquisition, ongoing operation and maintenance of pumping facilities, potential unsightliness, and unreliability if not located correctly.

If storage basins are not located to capture runoff naturally, collection systems must capture and convey runoff to the basins. When storms larger than the design event occur, or if inlets are blocked due to lack of maintenance, runoff will follow the natural gradient and could bypass the planned storage facility.

Storage basins can be classified as either retention or detention basins. Retention basins have no outlet and rely on evaporation and infiltration to drain the basin. Detention basins can be drained by gravity pipes, pumps, infiltration, evaporation, or a combination of these methods. For in-town basins, the maximum detention time, based on aesthetics and mosquito control, is five days, while the City prefers to have detention basins drained in two days. For basins outside of town, draining all water within a specific time is not a requirement.

Visalia's stormwater system has long relied on storage in combination with managed waterways and pumping to accommodate the limited downstream receiving capacity and the operational constraints imposed by shared-use channels/ditches. The planning emphasis has evolved toward aligning storage performance with the City's conveyance design intent and downstream discharge limitations using long-duration rainfall representations that reflect how runoff volume accumulates over multi-day conditions.

The following discusses alternative storage approaches and implications:

1. **Detention vs. retention:** Retention can reduce reliance on downstream discharge capacity but may be land-intensive and sensitive to soil/percolation conditions and groundwater considerations. Detention can be effective where controlled releases and pumping can be coordinated with available receiving capacity, but it requires operational reliability and maintenance of control facilities.

2. **Shared-use vs. single-use facilities:** Shared-use facilities (e.g., park-basin configurations) can improve land-use efficiency, but require explicit consideration of public safety, water depths, and drawdown timing.
3. **Crediting infiltration in sizing:** For detention basin sizing, City standards indicate that infiltration should not be incorporated into detention basin sizing; detention basin seepage should be set to "not allowed" (or equivalent). Retention basins may still rely on infiltration/evaporation as the drainage mechanism, but performance assumptions should be consistent with field observations and accepted criteria. It should be noted that infiltration and evaporation were not included in the modeling conducted for this study, except where current in-situ infiltration information was available. This credit discussion applies to future design projects.

The City recently transitioned to stand-alone retention basins. Observations from this change (both positive and negative) should be noted over time. City staff should reconvene after a reasonable amount of time and discuss the observations to understand if this approach is the best for the City.

7.3 Temporary Storage Basins

The City's long-term stormwater management strategy is to convey runoff to regional standalone retention basins that serve as primary control points for peak flow attenuation and stormwater management. However, until regional basins are constructed, expanded, or otherwise available (and in areas where regional capacity is constrained), new development should provide interim on-site storage to mitigate increases in downstream peak flows and runoff volumes attributable to development. These temporary facilities are intended to function as near-term controls that can be modified, integrated, or phased out as regional infrastructure becomes available.

Temporary storage facilities shall be designed so they do not conflict with the ultimate drainage pattern identified in this SWMP. Where future regional trunk lines or basins are planned, temporary facilities shall be configured to allow future connection, modification, or removal as permanent infrastructure is implemented. Final requirements for temporary storage shall be coordinated with City development review and shall remain consistent with the drainage criteria described in Chapter 10.

7.4 Stormwater Conveyance

Future storm drain trunk lines will be required to convey runoff generated from newly developed areas. The future trunk lines should be installed as part of the street projects to the extent practicable as the future areas of the City are developed.

Stormwater conveyance methods in Visalia include combinations of:

1. Underground storm drainpipe networks (minor system).
2. Open channels and managed waterways/ditches (major system).
3. Overland flow pathways that convey stormwater when the underground network surcharges.

Open channel conveyance systems are the least expensive method of managing stormwater runoff when the right of way is available, riparian habitat is managed, and aesthetics can be maintained.

Future projects considered in this SWMP generally focus on installing storm drainpipe to convey runoff to storage basins. Open channels may also be feasible in some locations where ROW, maintenance, habitat,

safety, and regulatory considerations can be addressed. Future conveyance improvements identified in this SWMP are intended to route runoff from planned development areas to future storage facilities, existing receiving facilities, or controlled discharge points. The purpose of future trunk conveyance is not to maximize discharge to downstream waterways, but to provide a planned drainage backbone that works in combination with storage and controlled release.

Where upsizing of existing or planned conveyance is needed to serve development beyond the limits of a specific project, the improvement should be evaluated using the master plan implementation criteria described in Chapter 10. This is particularly important for oversized lines or deeper trunk infrastructure that may serve multiple future development areas and may require reimbursement or cost-sharing considerations.

A key implication for conveyance planning is that enlarging local conveyance capacity without addressing downstream constraints can shift flooding impacts rather than resolving them. Because stormwater discharges are often constrained by downstream ditch/creek capacity and operational conditions, the conveyance system must be planned as part of an integrated storage + controlled discharge + overland relief framework.

7.5 Entitlement Flow Management Alternatives

Stormwater runoff has historically discharged into natural creeks and ditches that flow through the City. Many of these same conveyance systems are also used to convey irrigation deliveries and flood control releases from Kaweah Lake.

If irrigation deliveries and/or flood control releases occur at the same time as an intense storm on the town, the rate at which City runoff can be discharged into the channels may be limited, particularly to the privately owned channels.

To avoid this conflict, the City is considering methods to temporarily manage the irrigation flows and flood control releases. This will provide additional capacity for the management of stormwater runoff in the City.

The maximum entitled irrigation and flood flows are controlled by the Kaweah and St. John's Rivers Agreement. The entitlement and one day storage for each of the creeks and ditches passing through Visalia are summarized in Table 7.1.

Table 7.1 Entitlement Flows and Volumes

Source	Channel	Maximum Winter Entitlement (cfs)	One Day Storage (ac-ft)
Lower Kaweah River	Packwood Creek	265	526
	Evans Ditch	54	107
	Mill Creek	99	196
	Sub-Total	**418**	**829**
St. John's River	Modoc	99	196
	Total	**517**	**1,025**

All or any portion of the entitled irrigation flows for a one-day period could be temporarily stored upstream of Visalia to provide additional conveyance capacity in downstream channels for stormwater runoff. After the storm, the stored water would be released back to the channels.

It must be emphasized that any modification to management of the entitlement flows will require agreements with the irrigation companies. Possible entitlement flow management alternatives include upstream storage and flow diversion.

7.6 Assumptions and Limitations

The FCIPs developed in this SWMP do not assume that entitlement flow management alternatives will be implemented unless specifically documented for a project. Any change to irrigation, flood-control, or shared-use waterway operations would require additional coordination with the applicable ditch companies, irrigation districts, and other responsible agencies. Therefore, entitlement flow management should be considered a potential future study or operational coordination measure rather than a substitute for the storage and conveyance improvements identified in this SWMP.

CHAPTER 8 PROPOSED IMPROVEMENTS

CIPs were identified. The existing conditions CIPs were identified for the existing development and storm drain system to address current flooding and deficiency issues. The FCIPs were identified for the future buildout condition of the City, utilizing the General Plan future land uses, and will be implemented as areas are developed.

8.1 Capital Improvement Project Cost Estimates

The unit costs for the planning level cost estimates are based on actual costs of similar projects and line items, vendor quotes, and recent bid items available in public databases for similar projects and line items. The unit costs were reviewed and adjusted by City staff based on current projects and City policies.

The planning level estimates include the cost of excavation, labor, materials, landscaping, restoration of existing road surface conditions, disposal of removed systems, protection of existing systems, and land acquisition, as appropriate.

The costs do not account for inflation or interest rates for a future implementation date. The cost of permits, unless identified, is not included in the estimates.

Table 8.1 shows the assumptions made for items such as engineering, construction management, project administration, etc. Table 8.2 shows the unit cost values for the project components.

Table 8.1 Associated Project Cost Assumptions

Description	Unit Cost ($)
Mobilization Rate	10.0%
Contingency	30.0%
Engineering	10.0%
Construction Management	10.0%
Project Administration	7.5%
Construction Baseline Schedule and Updates	$1,100
Temporary Erosion Control/ Stormwater Pollution Prevention Plan	$2,800
Pothole Utilities	$5,000
Construction Survey	$12,000
Traffic Control	$8,000

Table 8.2 Cost Values for Project Components

Cost Category	Cost Item	Unit	Unit Cost ($)
RCP pipe	Construct 18-inch RCP Storm Drain	lf	$284
RCP pipe	Construct 24-inch RCP Storm Drain	lf	$300
RCP pipe	Construct 30-inch RCP Storm Drain	lf	$340
RCP pipe	Construct 36-inch RCP Storm Drain	lf	$370
RCP pipe	Construct 42-inch RCP Storm Drain	lf	$410
RCP pipe	Construct 48-inch RCP Storm Drain	lf	$560
RCP pipe	Construct 54-inch RCP Storm Drain	lf	$670
RCP pipe	Construct 60-inch RCP Storm Drain	lf	$840
General	Land Acquisition(2)	acre	$150,000
General	Perimeter Fencing(2)	lf	$56
General	Perimeter Landscaping(2)	sf	$6
General	ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)(2)	lf	$232
General	ROW/Frontage (Drive Approach)(2)	each	$7,000
General	ROW/Frontage (Corner Improvements)(2)	each	$14,000
Structure	Construct Storm Drain Manhole / Junction Structure	each	$16,000
Structure	Construct Basin Inlet / Outlet Structure	each	$32,000
Structure	Tie-In to Existing Storm Drain / Existing Utility	each	$10,900
Storage basin	Storage Basin Excavation / Regrading(1)	y3	$33
Storage basin	Basin Site Restoration / Irrigation Repair Allowance	LS	$54,500
Storage basin	Basin Access / Miscellaneous Appurtenances	LS	$27,300
Pump / wet well	Small Stormwater Pump Installation Allowance	each	$272,300
Pump / wet well	Pump Wet Well Modification / Replacement Allowance	LS	$199,100
Pump / wet well	Small Force Main / Pump Discharge Pipe	lf	$164
Open Channel / Swale	Construct Trapezoidal Drainage Swale / Channel*	y3	$33

Notes:
lf - linear foot; y^3 - cubic yard; sf - square foot; LS - lump sum.

(1) Planning-level unit cost of $33 per y^3 was used for storage basin excavation and regrading, consistent with City direction. Actual earthwork costs may be higher or lower depending on site conditions, excavation and grading requirements, material suitability, hauling and disposal needs, and whether excavated material can be beneficially reused or removed by others in exchange for the material.

(2) Where applicable, proposed basin footprints were represented as equivalent-area 2:1 rectangles. Perimeter fencing was assumed to be approximately 15 feet outside the top-of-basin footprint, and an additional 15-foot-wide landscape buffer was assumed outside the fence. The land-acquisition area includes the basin footprint and these perimeter allowances. Frontage improvements were assumed along one long side and one short side of the conceptual site, with a 5-foot allowance at each end. One drive approach and one corner-improvement allowance were included per proposed basin. Where project-specific ownership, existing-site conditions, frontage configuration, and other information was available, the quantities were adjusted accordingly.

8.2 Existing Conditions - Capital Improvement Projects

Three Existing Conditions CIPs were identified. Project types include pipe removal and replacement, pump wet well replacements and new pipe construction.

The Existing Conditions CIPs are summarized in Table 8.3. Detailed project descriptions, figures, quantities, and cost estimates are provided in the CIP cut sheets in Appendix I. Figure 8.1 shows the locations of the Existing Conditions CIPs.

Table 8.3 Existing Conditions CIPs Brief Descriptions and Costs

Existing Conditions	Description	Total Project Cost
CIP No. 1	South County Center Drive Wet Well & Evans Ditch Overflow Upgrade	$424,700
CIP No. 2	North McAuliff Street Storm Drain Replacement between Houston & Douglas	$512,700
CIP No. 3	Kiwanis Park Basin and Wet Well Improvements	$450,300
Total Cost:		**1,387,700**

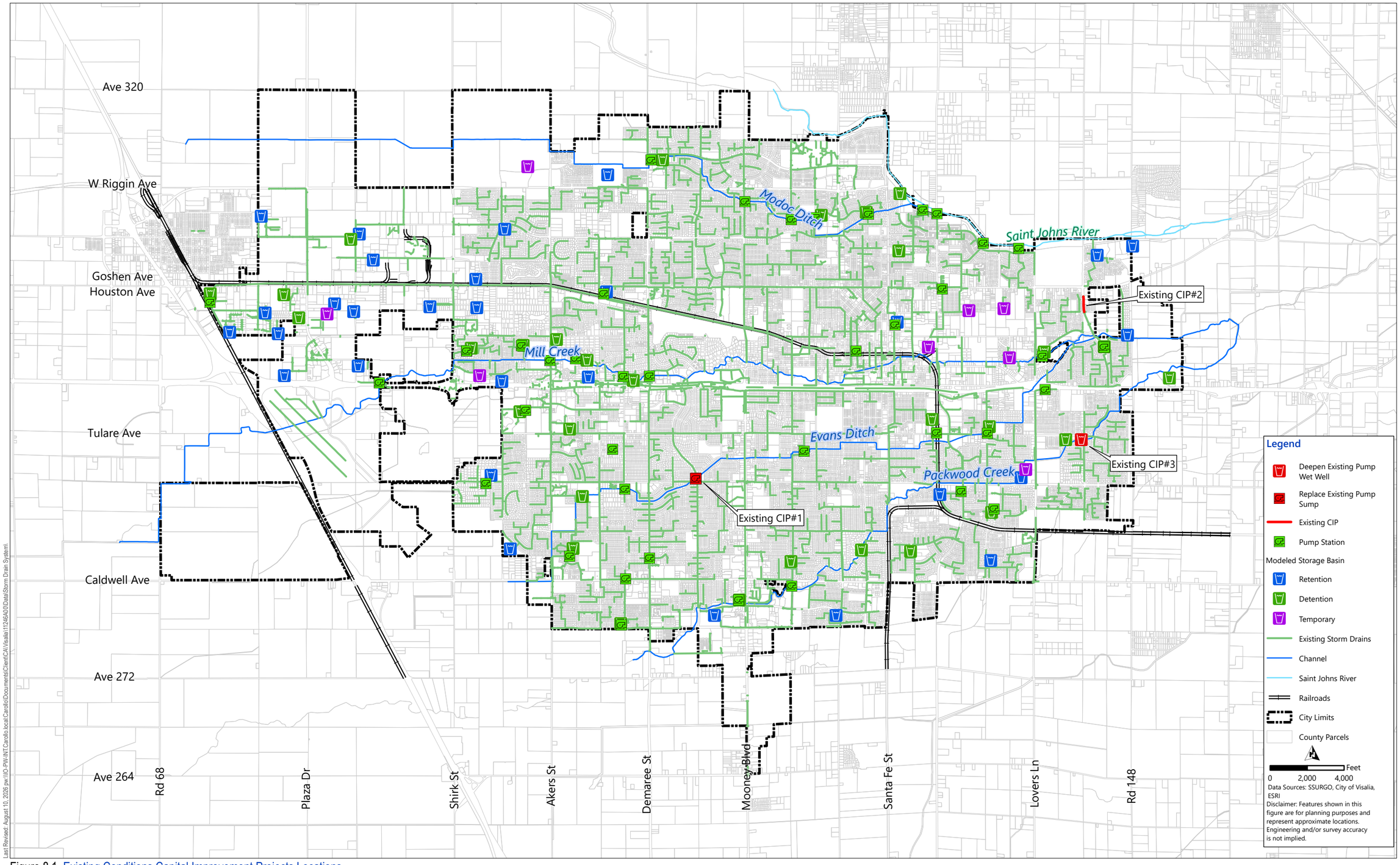


Figure 8.1 Existing Conditions Capital Improvement Projects Locations
CITY OF VISALIA
MASTER PLANS AND FINANCIAL NEXUS STUDY

8.3 Future Conditions - Capital Improvement Projects

FCIPs were developed to provide the planned drainage infrastructure needed to serve General Plan buildout and known future development areas. The proposed improvements include new trunk storm drain, storm drain upsizing or replacement, future standalone retention basins, storage basin expansion or modification, basin inlet/outlet structures, tie-ins to existing or planned infrastructure, and pump or wet well-related improvements where required by the modeled drainage configuration.

The FCIPs were developed using the Future Conditions model with proposed FCIPs as described in Chapter 6.

The projects are intended to provide a planning-level drainage backbone for future growth while maintaining the City's storage-first and controlled-discharge stormwater management strategy. Because the City's receiving waterways have limited and operationally constrained capacity, the future improvements emphasize storage, controlled routing, and targeted conveyance rather than unrestricted downstream discharge.

The FCIPs are summarized in Table 8.4. Detailed project descriptions, figures, quantities, and cost estimates are provided in the CIP cut sheets in Appendix J. Figure 8.2 shows the locations of the FCIPs and their tributary areas.

Table 8.4 Future Conditions CIPs Brief Descriptions and Costs

Future Conditions CIP[1]	Urban Growth Tier	Description	Total Project Cost
FCIP No. 0	Tier 3	Carlton Acres Storm Drain and Basin Improvements	$30,796,300
FCIP No. 1N	Tier 3	Avenue 320 and Linwood Street Storm Drain and Basin Improvements	$14,872,800
FCIP No. 1S	Tier 1	Modoc Basin Storage Improvements	$48,322,600
FCIP No. 2E	Tier 2	North Giddings Street Storm Drain Improvements	$626,800
FCIP No. 2W	Tier 3	Mooney Boulevard and Riverway Drive Storm Drain Improvements	$1,201,300
FCIP No. 3	Tier 1	Foxwood Park Basin Storage Improvements	$4,565,600
FCIP No. 4	Tier 1	River Run Ranch Basin West Pump Improvements	$569,200
FCIP No. 5	Tier 3	River Run Ranch East Storm Drain and Basin Improvements	$3,688,500
FCIP No. 6	Tier 2	Scenic Corridor Northwest Storm Drain and Basin Improvements	$11,071,900
FCIP No. 7	Tier 1	Hillsdale Basin and Shirk Road Storm Drain Improvements	$4,352,700
FCIP No. 8	Tier 1	Goshen Avenue and Goshen/Virmargo Basin Storm Drain Improvements	$13,410,600
FCIP No. 9	Tier 2	Southwest SR-198/Shirk Road Drainage Area Storage Basin Improvements	$8,065,000
FCIP No. 10	Tier 2	Scenic Corridor Southeast Storm Drain and Basin Improvements	$4,937,000
FCIP No. 11	Tier 3	Walnut Avenue and Road 86 Storm Drain and Basin Improvements	$11,161,700
FCIP No. 12	Tier 2	Shirk Road and Tulare Avenue Storm Drain and Basin Improvements	$9,531,300

Future Conditions CIP[1]	Urban Growth Tier	Description	Total Project Cost
FCIP No. 13	Tier 3	Road 152 and Houston Avenue Storm Drain and Basin Improvements	$5,499,200
FCIP No. 14	Urban Reserve Area	Caldwell Avenue and Shirk Street Storm Drain and Basin Improvements	$20,237,100
FCIP No. 15	Urban Reserve Area	South Shirk Road and Avenue 276 Storm Drain and Basin Improvements	$7,180,600
FCIP No. 16E	Tier 3	Avenue 272 East Storm Drain Improvements	$13,347,300
FCIP No. 16N	Urban Reserve Area / Tier 3 / Tier 2 / Tier 1	Southeast Caldwell/Shirk Tributary Storm Drain and Basin Improvements	$7,081,200
FCIP No. 16W	Tier 3	Avenue 272 West Storm Drain and Tagus Basin Improvements	$16,029,200
FCIP No. 17	Tier 3	Demaree Road and Avenue 272 Storm Drain and Basin Improvements	$17,475,300
FCIP No. 19	Tier 3	Avenue 274 and Stonebrook Area Storm Drain and Basin Improvements	$8,334,200
FCIP No. 20	Tier 3	Avenue 272 and Stonebrook Area Storm Drain and Basin Improvements	$3,421,700
FCIP No. 21	Tier 1	Burke Street North Basin Expansion Improvements	$3,681,100
FCIP No. 22NE	Tier 1	Cameron Creek Northeast Storm Drain and Retention Basin Improvements	$5,087,200
FCIP No. 22NW	Tier 2	Cameron Creek Northwest Retention Basin Improvements	$3,036,400
FCIP No. 22S	Tier 3	Cameron Creek South Storm Drain and Storage Basin Improvements	$10,033,600
FCIP No. 23	Tier 3	Pinkham Street and Avenue 272 Storm Drain and Basin Improvements	$13,240,900
FCIP No. 24	Tier 1	Cameron Creek North/Future Southeast Growth Area Storm Drain and Basin Improvements	$7,738,400
FCIP No. 25E	Tier 3	Cameron Creek South East Storm Drain and Basin Improvements	$9,666,400
FCIP No. 25W	Tier 2	Cameron Creek Southwest Storage Basin Improvements	$5,703,600
FCIP No. 26	Tier 3	Lovers Lane South of Avenue 280 Storm Drain and Basin Improvements	$10,897,200
FCIP No. 27	Tier 3	McAuliff Street and Visalia Parkway Storm Drain and Basin Improvements	$14,526,300
FCIP No. 28	Tier 1 / Tier 3 / Tier 2 / Outside UGB	South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements	$10,778,600
Total Cost			**$360,168,800**

Notes:
(1) FCIP numbering is not the order of priority. It is an arbitrary numbering system that is meant for identification only.

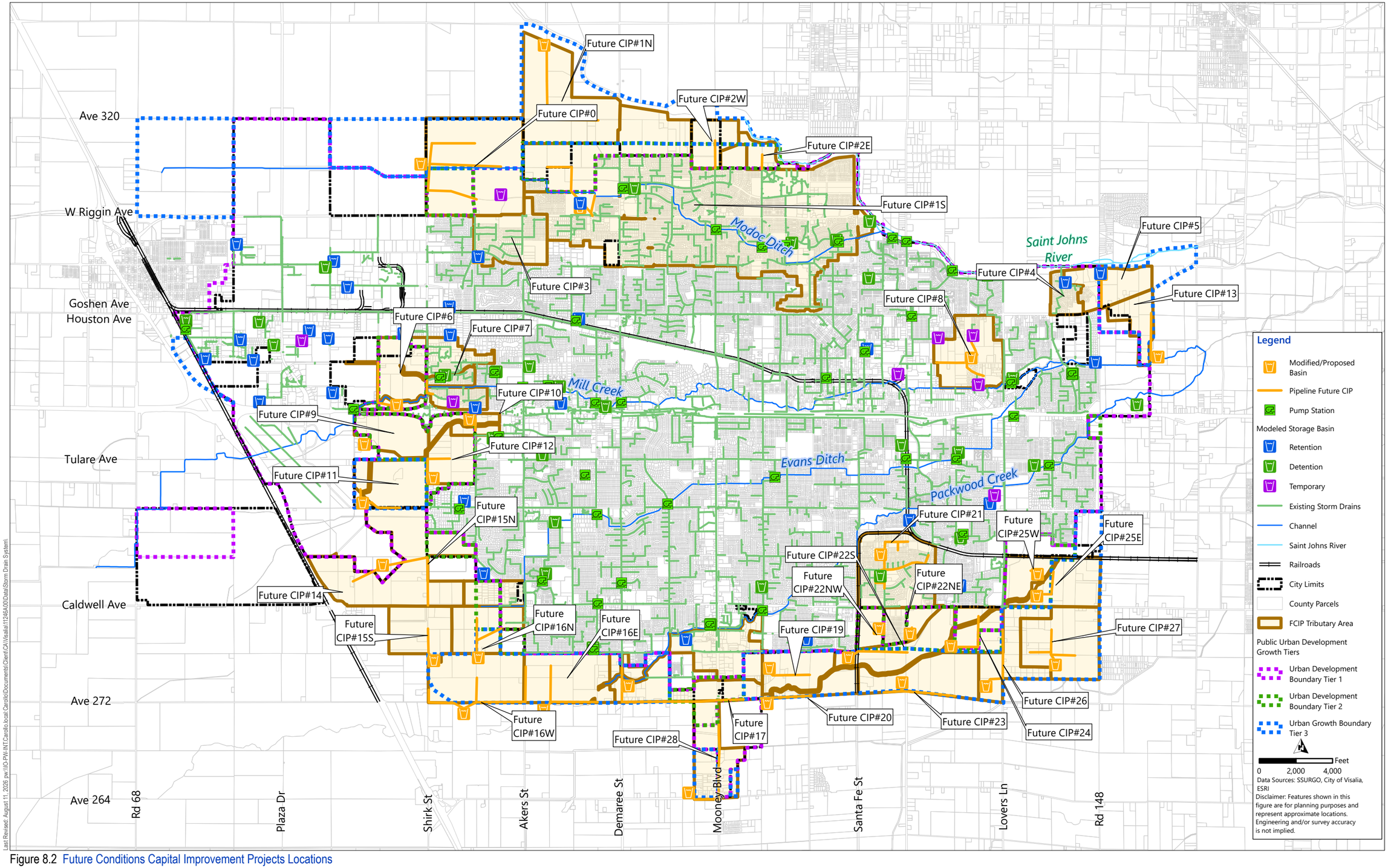


Figure 8.2 Future Conditions Capital Improvement Projects Locations

8.4 Assumptions and Limitations

1. The FCIPs are intended to be implemented as future development occurs and as supporting downstream or regional drainage infrastructure is needed.
2. A priority matrix was not developed for the FCIPs because implementation timing will largely depend on development phasing, land availability, ROW needs, utility conflicts, funding availability, and coordination with roadway or development projects. Future CIP sequencing should remain flexible. Some improvements may need to be constructed earlier than others if they are required to serve an active development area, provide downstream connectivity, or support a larger regional drainage improvement.
3. As development proceeds, the City should review the Future Conditions model, completed infrastructure, and current development plans to confirm which improvements are needed and whether project limits, pipe sizes, basin geometry, or costs should be refined before final design.
4. Future storage basin geometry is conceptual and intended for master planning, cost estimating, and impact fee/nexus study development. Final basin footprints, excavation depths, side slopes, freeboard, maintenance access, landscaping, and inlet/outlet configurations should be confirmed during project-specific design.
5. Future conveyance alignments, pipe sizes, slopes, and tie-in elevations are planning-level. Final design should confirm pipe hydraulics, available cover, utility conflicts, constructability, receiving conditions, and downstream capacity.

CHAPTER 9 WATER QUALITY MEASURES

Development of urban areas can cause adverse impacts to the natural drainage systems and receiving waters. Steps can be taken to reduce potential water quality impacts from stormwater discharges including:

- Pollutant loading from impervious surfaces can be minimized through the implementation of Best Management Practices (BMPs) and LID.
- Development projects causing erosion impacts on natural drainage systems can implement hydromodification controls to mimic natural conditions.

Under Policy P-61 of the City's General Plan, stormwater quality and management are addressed under a scope of work separate from this SWMP. However, this section provides some general background and information about stormwater management as it relates to SWMP. Maintaining an inventory of stormwater system structures and outfalls as part of the SWMP is a pivotal component of the City's stormwater management program. The regular inspection and maintenance of the stormwater system components in the inventory ensure that the structures are clean, serviceable, and operating properly.

9.1 Background

The 1972 amendments to the federal Clean Water Act (CWA) prohibited the discharge of pollutants from point sources to the waters of the United States unless a permit issued under the NPDES permitting program authorized the discharge. The 1987 amendments to the CWA added Section 402(p), which defined certain stormwater discharges as point sources. The amendments directed USEPA to adopt regulations establishing permitting requirements for municipal and industrial stormwater discharges. The amendments also required stormwater discharges from MS4s to obtain coverage under an NPDES permit if the system served a population greater than 100,000 based on the 1990 Census. This became known as Phase I of the stormwater program. The Phase II program later expanded permitting requirements to smaller MS4s, including communities that were below the 100,000-population threshold at the time but may have grown since.

In December 1999, the USEPA promulgated the Storm Water Phase II Final Rule, which was intended to further protect the Nation's water resources from polluted stormwater runoff. The Phase II program expands the Phase I program by requiring operators of small MS4s (less than 100,000 residents) and operators of small construction sites to implement programs and practices to control polluted stormwater runoff, through the use of NPDES permits. In California, the federal NPDES permitting program is implemented by the State Water Resources Control Board and the Regional Water Quality Control Boards through the Porter-Cologne Act, a part of the California Water Code.

USEPA requirements fall into two primary categories: source identification and source control measures. The source identification component requires the inventory of storm sewer systems, the identification of regulated outfalls, the mapping of watersheds, and the identification of basin characteristics tributary to the outfalls. These items are discussed in this SWMP.

The source control measures deal primarily with management practices and are intended to reduce the introduction of pollutants to stormwater runoff by identifying problem sources and illicit connections and

establishing BMPs to control the introduction of contaminants such as suspended solids, oils, and grease. These items are discussed in much more detail in the separate stormwater management program and are described briefly in this document.

As a federally designated Phase II MS4, the City is required to obtain coverage under an NPDES stormwater permit. As part of the permit application, the City must develop a stormwater management program that addresses six MCMs. The MCMs include:

1. Public education and outreach.
2. Public involvement and participation.
3. Illicit discharge detection and elimination.
4. Construction site stormwater runoff control.
5. Post-construction stormwater management.
6. Pollution prevention and good housekeeping.

9.2 Stormwater Management Program

In November 2005, the City developed a Stormwater Management Program to support MS4 compliance. The Stormwater Management Program is currently being updated and will be issued as a separate document from this SWMP. The Stormwater Management Program addresses the City's MCMs and establishes criteria and guidance for post-construction stormwater controls, including LID retention, infiltration, and treatment measures.

These requirements are primarily intended to protect and improve water quality and mitigate potential water quality impacts associated with stormwater discharges. Water quality considerations are summarized briefly in this SWMP for context, with detailed requirements and implementation guidance provided in the separate Stormwater Management Program.

This SWMP is primarily a system planning document focused on storm drainage conveyance and storage performance and the identification and prioritization of capital improvements to reduce flooding and improve system reliability. MS4 compliance, by contrast, is achieved through a combination of programmatic requirements (e.g., MCM implementation), development-facing standards, and project-level design criteria addressing water quality, flow control, and hydromodification. Although the two documents serve different purposes, they are interrelated because post-construction requirements can influence runoff volumes, timing, and peak discharge characteristics that affect storm drain system performance and the assumptions used in master planning.

For example, MS4 post-construction provisions may include hydromodification management, such as limiting developed-condition peak runoff to pre-development peak runoff for a 2-year, 24-hour design storm (or other adopted criteria). As LID implementation increases (e.g., distributed retention, infiltration, and treatment controls), modeled runoff volumes and/or peak rates may be reduced or shifted in some areas, while also introducing long-term performance and maintenance considerations that can affect realized benefits. These interactions are recognized in this SWMP to support consistency between City development requirements and the planning assumptions used to evaluate and prioritize conveyance and storage improvements.

This SWMP acknowledges that MS4 compliance may drive additional capital or programmatic needs beyond flood-capacity deficiencies, such as regional or distributed water quality improvements, flow-control measures, or expanded inspection and maintenance programs. Specific MS4 compliance projects are not defined in this SWMP unless they are also needed for drainage system performance. Future MS4-related capital needs should be identified through the City's Stormwater Management Program, development review process, or subsequent focused studies.

9.3 Water Quality Considerations

Runoff from the City is generated from two principal land use types: urban areas and non-urbanized agricultural areas. The relative quantity of runoff from these areas is different due to the higher level of imperviousness associated with the urbanized areas. The water quality concerns from each land use differ.

The presence of homes, offices, and businesses in urbanized areas result in substantially more human activity such as vehicular traffic. Non-point source stormwater runoff from urbanized areas generally contains higher levels of greases, oil, and heavy metals. These particles are generally deposited on streets and driveways and are washed into the storm drain collection system during rainstorms and carried downstream. Nutrients from animal waste and lawn fertilizers are also common in urbanized areas and are often introduced into the storm drainage system. Other common urban area pollutants are household waste products. In many cases household cleaning agents, pesticides and other contaminants are disposed by homeowners into the storm drainage system.

In non-urbanized agricultural areas, the types and sources of pollutants are generally more easily identified. The most common pollutants are sediments from unprotected agricultural activities. Rainfall and the subsequent runoff from agricultural fields can provide a mechanism to transport large amounts of sediment to streams. Nutrients are frequently found in non-urbanized agricultural runoff from the byproduct of agricultural fertilization and can be transported along with sediments to streams.

Unless discharging to a retention pond, the gravity storm drains are discharged directly into the major drains without treatment. The pumped discharges provide opportunities to improve water quality. The holding ponds and forebays at the pumping stations provide an opportunity to settle suspended solids, some nutrients, and some metals from urban area runoff. There may also be an opportunity to provide oil and grease separators at the pump stations.

Once in the major drains, most flows are conveyed through open channels to the west side of the City. These channels are generally earthen or grass-lined and provide some benefit to water quality as a result of plant nutrient uptake. Velocities in these channels are generally lower than those of the collection system, which may result in settlement of some suspended solids. However, erosion from high velocities in the channels can be an additional source of suspended solids. Channel improvements should be designed to minimize the probability of erosion.

The collection and major drainage systems ultimately discharge into large ponding areas on the west side of town. These ponding areas provide significant storage and are emptied through evaporation and infiltration. Waterborne pollutants are transported to these ponding sites where the dissolved pollutants are potentially infiltrated into the subsurface and particulate pollutants are settled out.

The facilities proposed in this SWMP will not adversely impact stormwater quality. The use of detention basins and open channels may result in some improvement to water quality, through settling suspended solids and providing vegetation for nutrient uptake.

9.4 Assumptions and Limitations

1. FCIPs identified in this SWMP are intended primarily to provide drainage conveyance, storage, and controlled discharge capacity for future growth areas. These improvements are not expected to adversely affect stormwater quality. Future storage basins may provide incidental water quality benefits through sedimentation, vegetation uptake, and reduced peak discharge rates; however, these benefits are secondary to the hydraulic storage and conveyance functions evaluated in this SWMP.
2. Water quality treatment requirements for new development and redevelopment should continue to be addressed through the City's MS4 permit requirements, LID standards, and project-specific development review. Final design of future storm drain and basin improvements should incorporate applicable water quality, erosion control, and maintenance requirements where required by City standards or regulatory permits.

CHAPTER 10 DESIGN CRITERIA FOR MASTER PLAN IMPLEMENTATION

This chapter provides planning-level design criteria and implementation guidance for applying the SWMP to future development and City capital improvements. The criteria are intended to help the City, developers, and design engineers determine how future drainage infrastructure should be sized, coordinated, and implemented as development occurs.

The criteria in this chapter are not intended to replace the City's adopted Storm Drainage Design Criteria, the City's development review process, or project-specific engineering design. Rather, they provide master plan implementation guidance so that individual development projects and City capital projects remain consistent with the long-term drainage system identified in this SWMP.

10.1 Use of Stormwater Master Plan

The Future Conditions model and FCIPs identify the planned drainage backbone needed to support General Plan buildout. The master plan should be used to determine anticipated tributary areas, planned trunk storm drain alignments, future storage basin locations, estimated basin capacities, and locations where future development may need to construct or contribute toward regional drainage infrastructure.

Development projects should use this SWMP as the starting point for drainage planning. Project-specific drainage studies should confirm the applicable tributary area, downstream connection point, storm drain sizing, storage requirement, and consistency with the planned Future Conditions drainage system. Where a proposed development changes drainage patterns, modifies the assumed tributary area, or proposes a different outlet than shown in the SWMP, the applicant should demonstrate that the proposed configuration does not reduce downstream capacity, conflict with planned regional improvements, or increase flooding elsewhere.

10.2 Design Storm and Level of Protection

Future drainage infrastructure should be planned consistent with the design criteria described in Chapter 3 and the hydrologic approach described in Chapter 4. For master planning purposes, Future Conditions improvements were evaluated using a sequence of three 2-year, 24-hour storm events separated by 2-day gaps. This storm sequence provides the planning basis for the FCIPs and is intended to represent the City's future storage and trunk drainage planning framework.

The City's minor drainage system is intended to manage frequent storm events while recognizing that moderate street ponding may occur during larger or more intense events. Future improvements should therefore be designed to safely route runoff to storage facilities, trunk storm drains, or controlled discharge points without creating adverse downstream impacts.

10.3 Accepted Calculation Methods

Drainage calculations prepared for future development should remain consistent with the City's adopted Storm Drainage Design Criteria and development review requirements. The Rational Method may continue to be used for site-level and local conveyance design where appropriate under City criteria.

For larger tributary areas, regional storage facilities, trunk storm drains, pump-controlled systems, or improvements that interact with the City's master planned drainage network, hydrologic and hydraulic modeling may be required. USEPA-SWMM or another City-accepted modeling platform should be used where routed hydrographs, storage, pump controls, backwater, surcharge, or system interactions materially affect the design.

Minimum pipe size, slope, velocity, runoff coefficient, and storage calculation requirements should remain consistent with the City's adopted Storm Drainage Design Criteria unless a project-specific drainage study demonstrates that an alternate approach is appropriate and is accepted by the City. Where the SWMP identifies larger regional infrastructure needs, the SWMP model, FCIPs, and supporting cut sheets should be used to confirm whether development-specific improvements must be sized beyond the local project drainage requirement.

Project-specific studies should document rainfall assumptions, runoff coefficients or CNs, tributary area delineations, time of concentration assumptions, storage calculations, outlet controls, downstream tie-in elevations, and any deviations from the master plan assumptions.

10.4 Tributary Area and Drainage Boundary Confirmation

The tributary areas shown in the Future Conditions model are planning-level drainage areas developed to represent General Plan buildout and proposed FCIP infrastructure. These tributary areas should be used for planning, funding, and consistency review, but they should be confirmed during project-specific design.

Final drainage boundaries should be based on detailed grading plans, survey information, roadway profiles, proposed storm drain alignments, and the planned outlet location. If final grading changes the tributary area to a planned trunk storm drain or storage basin, the project-specific drainage study should confirm that the receiving infrastructure has adequate capacity or identify the required improvement.

10.5 Future Storm Drain Design

Future trunk storm drains should generally follow the alignments, sizes, and outlet locations identified in the FCIPs unless a project-specific drainage study demonstrates that an alternate configuration provides equivalent or better performance and is accepted by the City.

For master planning, future storm drain conduits were generally modeled with a minimum diameter of 18-inches and a minimum slope of 0.001 feet per foot unless project-specific conditions required a different configuration. Final design should confirm pipe size, slope, hydraulic capacity, cover, utility conflicts, constructability, and downstream tie-in conditions.

The City's current maximum allowable spacing between storm drain manholes is 500 feet. For planning-level quantity and cost estimating in the FCIP cut sheets, manhole quantities were estimated using a preferred spacing of approximately 400 feet, with additional structures included where warranted by changes in pipe size, alignment, connections, or other project-specific conditions.

The 400-foot planning assumption was not incorporated as a maximum spacing requirement in the hydraulic models and does not revise the City's 500-foot maximum for final design. Final manhole locations and spacing shall be established during project-specific design in accordance with applicable City standards.

Where a proposed development is required to construct a segment of master planned trunk storm drain, the constructed facility shall be sized to serve the ultimate tributary area identified in the SWMP, not only the project's immediate development footprint, unless otherwise approved by the City.

10.6 Future Storage Basin Design

Future storage basins should generally be planned as standalone retention basins unless a different project-specific configuration is accepted by the City. Future storage facilities should be sized to provide the storage capacity needed for the tributary area and applicable design storm criteria.

For master planning purposes, standalone basin concepts generally assume an excavated basin configuration with approximately 23 feet of total depth, approximately 18 feet of design water depth, and freeboard allowance. These dimensions are planning-level assumptions only. Final basin design should confirm basin footprint, side slopes, maintenance access, inlet and outlet configuration, freeboard, fencing or safety requirements, landscaping, groundwater conditions, geotechnical constraints, and long-term maintenance needs.

Future storage basin sizing should generally not rely on seepage or infiltration credit.

10.7 Pump Stations, Wet Wells, and Controlled Discharge

Pump stations and wet wells should be evaluated where gravity discharge is not feasible or where controlled discharge is needed because of downstream receiving constraints. Pump sizing, wet well volume, controls, and discharge location should be coordinated with the receiving system and applicable operational constraints.

Where discharge is routed to a shared-use waterway, ditch, canal, or existing storm drain system, the project-specific design should confirm that the discharge rate, timing, and outlet configuration are consistent with City requirements, receiving-system capacity, and applicable agreements or agency coordination requirements.

10.8 Pipe Oversizing and Reimbursement Considerations

Some future improvements may need to be larger, deeper, or longer than required to serve an individual development project because they also provide regional benefit or serve upstream/downstream future development areas. These improvements may include oversized trunk storm drains, deeper storm drain segments, regional basin excavation, basin inlet/outlet structures, and downstream tie-ins needed to serve the ultimate drainage area.

Where a development project is required to construct infrastructure that exceeds the capacity needed for that project alone, the City should evaluate whether the improvement is eligible for reimbursement, credit, cost sharing, or inclusion in a future funding mechanism. Eligibility should be based on whether the improvement provides benefit beyond the developing parcel, is consistent with the SWMP, serves an identified future tributary area, and is constructed to City standards.

For storm drain improvements not explicitly listed as a FCIP, the City may require a high-level oversizing evaluation during development review. The evaluation should compare the pipe size, depth, basin volume, or related infrastructure needed to serve the individual development against the improvement needed to serve the ultimate tributary area identified in the SWMP. Where detailed hydraulic cost allocation is not practical at the planning stage, the City may apply a percentage-based allocation or other planning-level method to estimate the regional oversizing share for use in reimbursement, credit, cost-sharing, or future funding mechanism decisions. The allocation should be refined during final design as pipe sizes, depths, quantities, ROW needs, and construction costs are better defined.

10.9 Cost Estimating and Funding Implementation

The FCIPs provide planning-level cost estimates for master planning, capital improvement programming, and funding/nexus study development. These estimates are not final construction estimates. Project-level costs should be updated during design to reflect current unit prices, survey, geotechnical information, utility conflicts, traffic control needs, ROW requirements, permitting, construction phasing, and final quantities.

Future CIP implementation should be coordinated with development timing, roadway improvements, utility projects, and land acquisition or easement needs. Where feasible, planned trunk storm drains should be installed with roadway or development projects to reduce reconstruction costs and improve implementation efficiency.

10.10 Deviations from the Master Plan

Deviations from the SWMP may be appropriate where updated development plans, grading, field conditions, utility conflicts, land availability, or other constraints make the planned configuration impractical. Any proposed deviation should be supported by a project-specific drainage study demonstrating that the revised configuration provides equivalent or improved performance compared with the SWMP concept.

At a minimum, the study should demonstrate that the proposed change does not increase flooding, reduce storage capacity, reduce downstream conveyance reliability, conflict with future regional infrastructure, or shift drainage impacts to adjacent properties or downstream facilities.

10.11 Model Updates and Documentation

The Future Conditions model should be updated periodically as development occurs and as major drainage infrastructure is constructed. Development projects that construct master planned drainage facilities should provide record drawings, final pipe sizes and slopes, basin grading information, stage-storage data, outlet/control information, pump information, and updated drainage boundaries to support future model updates.

Maintaining an updated model will allow the City to track completed improvements, refine future project needs, confirm remaining capacity, and support future updates to capital improvement planning and drainage funding mechanisms.

CHAPTER 11 RECOMMENDATIONS FOR FUTURE STUDIES

This chapter identifies recommendations for maintaining and implementing the SWMP after adoption. The FCIPs developed in this SWMP provide a planning-level drainage framework for General Plan buildout; however, implementation will occur over time as development proceeds, funding becomes available, and project-specific design information is developed.

To keep the SWMP useful for City staff, development review, capital improvement planning, and funding decisions, it is recommended the City maintain a structured system for tracking proposed stormwater improvements, constructed infrastructure, model updates, project costs, and remaining drainage needs. The recommendations in this chapter can be used to keep the SWMP current as an implementation tool, rather than to introduce new capital projects beyond those identified in Chapter 8.

11.1 Development Review Integration

It is recommended the City use the SWMP during development review to determine if proposed development is located within a tributary area served by a FCIP. Development applications could be reviewed against the planned drainage system to confirm whether the project is expected to construct, contribute to, or reserve space for master planned stormwater infrastructure.

Where a proposed development changes the assumed drainage pattern, outlet location, tributary area, or timing of a planned improvement, the applicant could then provide information on how these changes are incorporated in their project-specific drainage study to demonstrate that the proposed approach remains consistent with the SWMP.

11.2 Project Dependency and Phasing Review

Some FCIPs depend on downstream conveyance, regional storage, land availability, or other planned improvements. It is recommended the City track these dependencies so that projects are implemented in an order that supports system performance.

Before approving development that relies on a future regional stormwater improvement, the City would confirm whether the required downstream infrastructure is already in place, under design, funded, or still conceptual. Where downstream improvements are not yet available, interim storage or temporary drainage improvements could be required until permanent infrastructure is constructed.

11.3 As-Built and GIS Data Management

It is recommended the City require completed stormwater improvements to be documented with record drawings and GIS-ready asset information. This information can also be incorporated into the City's master GIS system.

For storm drain projects, record information should include pipe diameter, material, length, slope, upstream and downstream invert elevations, rim elevations, manhole or junction structure locations, and tie-in information. For storage basin projects, record information should include basin footprint, grading surface, inlet and outlet structures, stage-storage relationship, access features, and maintenance-related

appurtenances. For pump station or wet well improvements, record information should include pump curves, controls, wet well dimensions, operating elevations, discharge location, and electrical/mechanical equipment data.

11.4 Periodic SWMP Implementation Review

It is recommended the City perform a periodic SWMP implementation review to evaluate progress on proposed CIPs, completed development, constructed stormwater infrastructure, updated costs, and remaining drainage needs. This review could be completed annually or as part of the City's capital improvement planning process.

At a minimum, the review should identify:

1. CIPs completed since the last review.
2. CIPs modified or replaced by development-driven improvements.
3. Projects that should be advanced because of active or anticipated development.
4. Projects that should be revised because of updated design information.
5. Model updates completed or still needed.
6. Cost estimate updates.
7. New drainage issues observed since adoption of the SWMP.

This recurring review will help keep the SWMP active as an implementation tool rather than a static planning document.

11.5 Future SWMP Updates

It is recommended this SWMP be updated periodically as major development occurs, as CIPs are constructed, as drainage assumptions change, and as City policies or regulatory requirements evolve.

At a minimum, future SWMP updates should incorporate completed stormwater infrastructure, updated development assumptions, revised FCIP scopes, updated cost estimates, observed system performance, and any changes to City drainage criteria or funding priorities.

During the next SWMP update, it is recommended the major drains be incorporated into the collection systems portion of the model. This will better reflect the impacts of the major drains on the City's stormwater management infrastructure and vice versa.

Additionally, it is recommended that an existing surface cover layer be created to more accurately reflect the City's surface cover at the time of the plan. The data utilized for this plan is an acceptable industry dataset. However, technology is being developed that can create vector-based geospatial data depicting actual surface cover (i.e. building roofs, sidewalks, driveways, landscaped areas, etc.)

11.6 Model Update Tracking

It is recommended the City maintains a log of model updates associated with completed projects, approved developments, revised drainage areas, and changes to stormwater infrastructure. The log would identify what changed, when it changed, who provided the information, and whether the Existing Conditions model, Future Base model, or Future Conditions with FCIPs model was updated.

At a minimum, the model update tracking would include:

1. Constructed pipe sizes, lengths, slopes, and invert elevations.
2. Completed storage basin grading, footprint, and stage-storage information.
3. Pump and wet well information, including pump curves, on/off elevations, and discharge locations.
4. New or modified outfalls and tie-ins.
5. Updated subcatchment boundaries and land use assumptions.
6. Changes to FCIP limits, costs, or project descriptions.
7. Record drawing references and supporting design documents.

Maintaining this information will allow future SWMP updates to be more efficient as all the information is documented clearly in a single location.

11.7 Cost Update and Funding Support

It is recommended the planning-level costs developed in this SWMP be updated as projects move into design or as market conditions change.

Cost updates could identify whether changes are due to refined quantities, updated unit costs, added scope, ROW needs, utility conflicts, permitting requirements, construction phasing, or other project-specific factors. This information would support future capital improvement programming, development impact fee updates, reimbursement decisions, and financial nexus studies.

11.8 Aging Infrastructure and Culvert Replacement Planning

It is recommended the City consider a systemwide repair and replacement assessment for aging storm drain infrastructure, including culverts, older trunk storm drains, pump stations, wet wells, and appurtenant structures.

The assessment would use available asset age, material, condition, maintenance history, hydraulic importance, and consequence of failure to identify facilities that may require future rehabilitation or replacement.

The results could be used to develop rough-order-of-magnitude replacement needs and support future storm service charge or capital funding updates.

11.9 Operations and Maintenance Cost Evaluation

It is recommended that as development occurs and additional stormwater infrastructure is constructed, the City periodically evaluate whether staffing, equipment, inspection frequency, pump station maintenance, basin maintenance, sediment removal, vegetation management, and emergency response resources remain adequate.

This evaluation would consider the additional operations and maintenance burden associated with future trunk storm drains, storage basins, pump facilities, and shared-use waterway coordination.

11.10 CIP Tracking and Implementation Dashboard

A useful tool for the City's stormwater program could be a stormwater CIP tracking dashboard or similar implementation tracking tool. The dashboard would be to provide a single, current location for tracking the status of Existing Conditions CIPs, FCIPs, development-driven drainage improvements, and related stormwater infrastructure updates.

If developed, at a minimum, the dashboard could track the following information for each project:

1. CIP number and project name.
2. Project type, such as storm drain, storage basin, pump/wet well, tie-in, or combined improvement.
3. Project location and associated drainage area.
4. Planning-level project description.
5. Current implementation status, such as planned, in design, under construction, completed, deferred, modified, or removed.
6. Estimated planning-level cost and most recent updated cost.
7. Funding source or anticipated funding mechanism, if known.
8. Development area or project trigger associated with the improvement.
9. Dependencies on other storm drains, basin, roadway, utility, or development projects.
10. Design documents, record drawings, and as-built information, once available.
11. Whether the SWMM model has been updated to reflect the completed improvement.
12. Notes on known constraints, including ROW, easements, utilities, land availability, or downstream tie-in limitations.

Additionally, the dashboard could be linked to GIS where practical so that project locations, drainage areas, basin sites, and trunk storm drain alignments can be viewed spatially.

This tool would help City staff quickly identify which improvements are associated with a proposed development, which projects have already been constructed, and which remaining improvements may be needed before additional development can be served.

APPENDIX A

AGREEMENT PROVISIONS BY FACILITY

A.1 Overview

The City uses natural channels and ditches for stormwater conveyance, flood control, irrigation, and groundwater recharge. The following summarizes shared requirements across all partnering agencies.

A.1.1 Simultaneous Use

The City and agencies will coordinate to reduce flows if combined stormwater and irrigation/flood releases exceed channel capacity. Measures include adjusting City pump operations and redirecting flows through alternative channels. Costs for improvements to alternative channels are shared under separate agreements. These provisions do not modify flood release allocations defined elsewhere.

A.1.2 Development Review

Agencies may review tentative maps and development plans affecting creeks and channels. Comments are provided through the City's Site Plan Review process, and the City will implement comments it concurs with. Disputes proceed to arbitration. Development along channels must dedicate land and easements for system expansion and maintenance.

A.1.3 Joint-use Facilities

If agencies participate in improvements, facilities may be designated joint-use under a separate agreement defining rights and obligations. Capacity created by City improvements is reserved for City discharges unless otherwise agreed.

A.1.4 Channel Maintenance

The City maintains channels within City limits, including vegetation removal, bank repairs, rip-rap, and all crossings. Agencies retain responsibility for headgates and may not increase inflow without City consent.

A.1.5 City Discharge Points

New discharge points require gates or controls. The City will provide location maps and operational details, comply with State/Federal discharge requirements, and prohibit sanitary sewage, industrial process water, or hazardous waste. Water leaving the City must remain suitable for irrigation and recharge.

A.1.6 Flow Monitoring

The City will monitor selected constituents at representative discharge locations and provide results to TID upon request.

A.1.7 Compliance

All activities must comply with applicable laws and agency regulations, including California Department of Fish and Game requirements.

A.1.8 Replacement of Water

If City landscaping or channel modifications consume water otherwise available to agencies, the City will annually compensate for verified losses.

A.2 Individual Agreements

A.2.1 Mill Creek Agreement (KDWCD, 1993)

The City and the KDWCD entered an agreement on Mill Creek on July 8, 1993. Mill Creek is on the Lower Kaweah River and runs in a westerly direction through the City to a point where the channel divides into a north branch and main branch. The north branch runs in a westerly direction by the off-channel Goshen Pit, storage basin, and eventually into Cross Creek, which drains into Tulare Lake.

The main branch of Mill Creek runs in a southwesterly direction by the City's Sewage Treatment Plant and an off-channel storage basin owned by KDWCD, known as Basin No. 4, and eventually into Cross Creek, which drains into Tulare Lake. The agreement applies to the Mill Creek channel upstream of the point of division and the north branch and main branch downstream of the division.

KDWCD uses Mill Creek to transport water released from Lake Kaweah for flood control, irrigation, and other beneficial purposes. KDWCD also uses water from other sources downstream from Lake Kaweah through the City and beyond. The City uses Mill Creek as an integral part of the stormwater conveyance system and for other miscellaneous occurring surface waters collected within its boundaries.

A.2.1.1 Use of Mill Creek Channel

- Each party has the right to use the Mill Creek Channel for transporting waters.
- Each party has the right to utilize, use, and enjoy all rights of access and rights-of-way owned by each party in the portion of the Mill Creek Channel east of the point of diversion for Basin No. 4. The access will be for the purpose of inspecting, repairing, and maintaining the channel by the appropriate party.
- The City has the perpetual right to install and maintain crossings of Mill Creek, install and maintain discharge facilities in the banks of the channel, and to create open space amenities within City Limits. Amenities could include parks, bike or walking paths, and recreation areas along the banks of Mill Creek.
- The City has the perpetual right within its boundaries to alter the course of Mill Creek Channel and to encase the channel by installation of a pipeline, pipelines, or other means.

A.2.1.2 Effect of Annexation of Lands to City

As the City annexes further lands, which include other portions of Mill Creek, the provisions of the agreement apply to the system as it is annexed to the City. No further agreement between the parties will be necessary to reflect the annexation, but as each annexation becomes final, the City shall file with KDWCD maps showing each such annexation affecting Mill Creek and stating the effective date of such annexation.

A.2.2 Packwood Creek Agreement (TID/KDWCD, 1990)

Packwood Creek is a natural system originating on the Lower Kaweah River which runs southwesterly through the City and into the Tagus Basin in-channel storage facility owned by KDWCD, and eventually into Tulare Lake. The TID and KDWCD use Packwood Creek to transport water released from Lake Kaweah for flood control, irrigation, and other beneficial purposes, and Central Valley Project and other waters downstream to Tagus Basin and beyond.

The City uses Packwood Creek as an integral part of the stormwater system and for other miscellaneous occurring surface waters within its boundaries. User conflicts were resolved through an agreement dated September 10, 1990, with the following rights and requirements related to stormwater summarized below:

A.2.2.1 Use of Packwood Creek Channel

- The City has perpetual rights within City limits to install and maintain crossings of Packwood Creek, install and maintain discharge facilities in the banks, and to create open space amenities along the banks of Packwood Creek.
- The City has the perpetual right to alter the course of Packwood Creek Channel and to encase the same by installation of a pipeline or pipelines or other means within City boundaries.

A.2.3 Evans Ditch Agreement (EDC, 1993)

The City entered into an agreement with the Evans Ditch Company (EDC) on October 12, 1993 for the ownership and use of Evans Ditch. Evans Ditch is a manmade water course with a point of diversion from Mill Creek and runs generally southwesterly through the City and by an off-stream storage basin owned by KDWCD, referred to as Basin No. 13 and commonly known as Nelson Pit. EDC uses and utilizes Evans Ditch for diverting and transporting water released from Lake Kaweah for flood control, irrigation and other beneficial purposes, and waters from other sources downstream from Lake Kaweah through the City and beyond. The City utilizes Evans Ditch for conveying stormwater. The agreement details specific requirements for each party. General terms of the agreement are covered in Section 2.8.1 and specifics for Evans Ditch are provided in the following sections.

A.2.3.1 Ownership and Use of Evans Ditch Channel

EDC granted a Quit Claim Deed to the City for an undivided one-half (1/2) interest in and to the Evans Ditch channel and right-of-way within the city limits. The quitclaim is for rights to transport City stormwater runoff and other miscellaneous surface waters through Evans Ditch to off-line basins and to maintain the Evans Ditch. The quitclaim is exclusive of Evans Ditch's headgate and diversion facilities. The rights to be conveyed by EDC to the City are subordinate and inferior to Evan Ditch's established right to transport waters.

The City will has the perpetual right within City limits to install and maintain crossings of Evans Ditch, install and maintain discharge facilities in the banks, and to create open space amenities. Additionally, the City has the right within its boundaries to alter the course of the Evans Ditch channel and to encase the same by installation of a pipeline, or pipelines, or other means as long as the alteration or piping of the channel does not interfere with Evan Ditch's use of the channel or the delivery of water to its shareholders.

A.2.4 Modoc Ditch Agreement (MDC, 2016)

On March 11, 2016, the City and the Modoc Ditch Company (MDC) entered into an agreement regarding the use of Modoc Ditch (Modoc Ditch Company/City of Visalia, 2016). The agreement terminated all pre-existing agreements concerning the use of Modoc Ditch, including but not limited to the agreement of December 12, 1992. The agreement merged the other agreements into the 2016 Agreement as the sole expression of City's rights to the use and control of Modoc Ditch. The agreement contains the mutual and reciprocal rights, duties, and obligations of each of the parties to use Modoc Basin, the SK Ranch/Vander Stelt Basin Site and other related facilities. The following discussion summarizes key points related to the discharge of stormwater into the ditch, connection points, and coordination for stormwater operations along Modoc Ditch. The sections maintain the numbering within the agreement for ease of finding the full information in the referenced agreement.

A.2.4.1 Quitclaim by MDC of Interest in Modoc Ditch

MDC forever quitclaimed to the City an undivided one-third (1/3) interest in and to Modoc Ditch. The conveyance is exclusive of Modoc Ditch's headgate on the St. John's River and non-City diversion facilities, except such diversion facilities necessary to divert water to City property. The City rights of use of the one-third (1/3) interest in Modoc Ditch are defined in the agreement as follows:

- The City's right to use Modoc Ditch Channel shall generally be confined to the right to introduce and transport City stormwater runoff, or other water under the control of the City, from the point of introduction to a suitable point of disposal determined by the City and to access all of Modoc Ditch to for this use.
- The City cannot abandon City water in the Modoc Ditch Channel, and is responsible for prompt disposal of any introduced City water into the terminal basin facilities or other disposal or recharge facilities, except for seepage losses during transportation.
- The City has the right to use the Modoc Ditch channel for transportation of City water to the full capacity of Modoc Ditch Channel, but such use at all times, other than as specifically provided below, is subordinate and inferior to MDC's established right to transport waters in and along Modoc Ditch Channel. The City has the primary and superior right to 54 cfs capacity in the Modoc Ditch Channel between October 1 of any year and May 1 of the following year, and a subordinate right, subject to MDC's prior right, to the balance of the capacity of the Modoc Ditch Channel.
- If the MDC makes improvements to the SK Ranch/Vander Stelt Basin Site to meet all of MDC's entitled flood release flows between October 1 to May 1, the City can use the full capacity of the Modoc Ditch Channel for stormwater conveyance and disposal. The stormwater must be evacuated through diversion or seepage prior to the need for MDC to resume use of the Modoc Ditch Channel.
- MDC, at its cost, is solely responsible for maintaining the Modoc Ditch Channel, exclusive of any City-installed and maintained pedestrian, bike, or park facilities.
- The City has the right to install and maintain any discharge and diversion facilities on Modoc Ditch as long as the installation does not interfere with MDC's use of the Modoc Ditch Channel. Details must be forwarded to MDC for approval.
- No portion of the Modoc Ditch Channel can be abandoned without consent and approval of both MDC and the City.

A.2.4.2 Use by MDC of City Facilities

During the months of June through October of each year, MDC shall have the right to use Modoc Basin, or any remnant of Modoc Basin, for MDC's water balancing and/or recharge purposes under the following conditions:

- The MDC shall be permitted to divert water to Modoc Basin for water regulating or seasonal storage only to the extent that such diversions will not cause the water level in Modoc Basin to exceed a level that is equal to seven feet below the invert level of Modoc Ditch at the northeasterly point of introduction into Modoc Basin. This provision is intended to maintain, at all times, a certain minimum storage capacity available to City for layoff of water or disposal of unanticipated stormwater flows or nuisance flows.
- The City can modify the Modoc Basin regardless of whether the modification has the effect of diminishing, or eliminating the utility of the Modoc Basin for use by MDC.
- MDC's use of the Modoc Basin for water balancing and/or recharge does not constitute a bank, and MDC cannot recover any water recharged to the underlying groundwater aquifer as a result of MDC's use of the basin. MDC can recognize the groundwater benefit or credit under the provisions of a Groundwater Sustainability Plan in furtherance of the Sustainable Groundwater Management Act, or other similar regulatory or adjudicatory plan if MDC is able to establish entitlement to the benefit or credit.
- The City cannot use any water introduced by MDC into Modoc Basin unless agreed in writing between the parties. The City shall allow MDC to pump such water out of Modoc Basin when and in the amounts as determined by MDC, unless retaining such water in Modoc Basin violates some other provision of the Agreement.
- The City is not be obligated to compensate MDC for any water introduced by MDC into the Modoc Basin that recharges the groundwater aquifer underlying the Basin unless there is a written agreement between MDC and the City.
- MDC will waive any abandonment fee in relation to a request to abandon any portion of the Modoc Ditch facilities not located, based on the terms in the agreement.
- The City owns and operates the Shannon Ranch Basin, and has allowed the basin to be used by MDC as a water regulating and temporary storage site for MDC water when the use does not interfere with the City's use. MDC continues to have the right to introduce water to Shannon Ranch Basin. MDC, or St. John's Ditch Company as assignee of MDC, will continue to have the right to maintain a pump at the northwest corner of Shannon Ranch Basin to remove any water introduced by MDC or St. John's Ditch Company into the Shannon Ranch Basin. This will use will be limited to the months of June through October of each year.

A.2.4.3 City Use of SK Ranch/Vander Stelt Basin Site

The City has the right to divert City water into the SK Ranch/Vander Stelt Basin Site for the purpose of groundwater recharge, subject to the following conditions:

- City use cannot interfere with MDC's use of the SK Ranch/Vander Stelt Basin Site.
- The City must provide reasonable written notice to MDC of its intent to divert water into the SK Ranch/Vander Stelt Basin Site. The notice must include the intended diversion rate, duration, and

quantity. The diversion cannot begin until MDC has confirmed that the intended diversion can be accommodated.

- MDC has the right to allow diversion of water into the SK Ranch/Vander Stelt Basin Site by KDWCD prior to approving any diversion by the City of City water into the basin.

The City's diversions at the SK Ranch/Vander Stelt Basin Site are limited to the diversion capacities through the structures or facilities at the time of the intended diversion. The City cannot, without prior approval by MDC, make any improvements or install any structures or facilities to increase the diverted water onto the SK Ranch/Vander Stelt Basin Site.

The City may account for its use of the SK Ranch/Vander Stelt Basin as a beneficial use of water for groundwater recharge. However, the basin does not constitute a bank, and the City is not entitled to directly recover any water recharged to the underlying groundwater aquifer as a result of City's use of the basin.

A.2.5 Persian Ditch Agreement (PDC, 1993)

The City entered into an agreement with the Persian Ditch Company (PDC) on June 3, 1993 for the ownership and use of Persian Ditch. Persian Ditch is a manmade water course with a point of diversion from Mill Creek. PDC uses and utilizes Persian Ditch for diverting and transporting water released from Lake Kaweah for flood control, irrigation and other beneficial purposes, and waters from other sources downstream from Lake Kaweah through the City and beyond. The City utilizes Persian Ditch for conveying stormwater. The agreement details specific requirements for each party. General terms of the agreement are covered in Section 2.8.1 and specifics for Persian Ditch are provided in the following sections.

A.2.5.1 Ownership and Use of Persian Ditch Channel

PDC granted a Quit Claim Deed to the City for an undivided one-third (1/3) interest in and to the Persian Ditch channel and right-of-way within the city limits. The quitclaim is for rights to transport City stormwater runoff and other miscellaneous surface waters through Persian Ditch to off-line basins and to maintain the Persian Ditch. The quitclaim is exclusive of Persian Ditch's headgate and diversion facilities. The rights to be conveyed by PDC to the City are subordinate and inferior to Persian Ditch's established right to transport waters.

The City will has the perpetual right within city limits to install and maintain crossings of Persian Ditch, install and maintain discharge facilities in the banks, and to create open space amenities. In addition, the City has the right within its boundaries to alter the course of the Persian Ditch channel and to encase the same by installation of a pipeline, or pipelines, or other means as long as the alteration or piping of the channel does not interfere with Persian Ditch's use of the channel or the delivery of water to its shareholders.

A.2.6 Watson Ditch Agreement (WDC, 1993)

The City entered into an agreement with the Watson Ditch Company (WDC) on June 3, 1993 for the ownership and use of Watson Ditch. Watson Ditch is a manmade water course with a point of diversion from Mill Creek. WDC uses and utilizes Watson Ditch for diverting and transporting water released from Lake Kaweah for flood control, irrigation and other beneficial purposes, and waters from other sources

downstream from Lake Kaweah through the City and beyond. The City utilizes Watson Ditch for conveying stormwater. The agreement details specific requirements for each party.

A.2.6.1 Ownership and Use of Watson Ditch Channel

WDC granted a Quit Claim Deed to the City for an undivided one-third (1/3) interest in and to the Watson Ditch Channel and right-of-way within the city limits. The quitclaim is for rights to transport City stormwater runoff and other miscellaneous surface waters through Watson Ditch to off-line basins and to maintain the Watson Ditch. The quitclaim is exclusive of Watson Ditch's headgate and diversion facilities. The rights to be conveyed by WDC to the City are subordinate and inferior to Watson Ditch's established right to transport waters.

The City has the perpetual right within City limits to install and maintain crossings of Watson Ditch, install and maintain discharge facilities in the banks, and to create open space amenities. In addition, the City has the right within its boundaries to alter the course of the Watson Ditch Channel and to encase the same by installation of a pipeline, or pipelines, or other means as long as the alteration or piping of the channel does not interfere with Watson Ditch's use of the channel or the delivery of water to its shareholders.

A.2.7 Tulare Irrigation Canal Agreement

The City entered into an agreement with the Tulare Irrigation Company (TIC) on June 18, 1991 for the ownership and use of Tulare Irrigation Canal. Tulare Irrigation Canal is a manmade water course with a point of diversion from the Lower Kaweah River and runs southwesterly until it crosses the Atchison, Topeka, and Santa Fe (AT&SF) Railroad line along Road 128 (Santa Fe Avenue) and flows south to its confluence with Cameron Creek. TIC uses Tulare Irrigation Canal for diverting and transporting water released from Lake Kaweah for flood control, irrigation and other beneficial purposes, and waters from other sources downstream from Lake Kaweah through the City and beyond. The City utilizes Tulare Irrigation Canal for conveying stormwater. The agreement details specific requirements for each party. General terms of the agreement are covered in Section 2.8.1 and specifics for Tulare Irrigation Canal are provided in the following sections.

A.2.7.1 Ownership and Use of Tulare Irrigation Canal

TIC granted a Quit Claim Deed to the City for an undivided one-third (1/3) interest in and to the Tulare Irrigation Canal channel and right-of-way within the city limits. The quitclaim is for rights to transport City stormwater runoff and other miscellaneous surface waters through Tulare Irrigation Canal to off-line basins and to maintain the Tulare Irrigation Canal. The quitclaim is exclusive of Tulare Irrigation Canal's headgate and diversion facilities. The rights to be conveyed by TIC to the City are subordinate and inferior to Tulare Irrigation Canal established right to transport waters.

The City has the perpetual right within City limits to install and maintain crossings of Tulare Irrigation Canal, install, and maintain discharge facilities in the banks, and to create open space amenities. In addition, the City has the right within its boundaries to alter the course of the Tulare Irrigation Canal channel and to encase the same by installation of a pipeline, or pipelines, or other means as long as said alteration or piping of the channel does not interfere with Tulare Irrigation Canal's use of the channel or the delivery of water to its shareholders.

APPENDIX B

STORM DRAINAGE DESIGN CRITERIA

Storm Drainage Design Criteria is currently being updated by the City. The updated criteria should be requested from the City for any projects within the City.

STORM DRAINAGE DESIGN CRITERIA

LEVEL OF PROTECTION

ITEM	VOLUME	LEVEL OF PROTECTION
MINOR (COLLECTOR) DRAINS	N/A	2 YEAR
MAJOR DRAINS	N/A	10 YEAR
IN-TOWN DETENTION BASINS	10 YEAR – 1 DAY	10 YEAR – 10 DAY
IN-TOWN RETENTION BASINS	10 YEAR – 10 DAY	10 YEAR – 10 DAY
INDUSTRIAL PARK RETENTION BASINS	10 YEAR – 10 DAY	10 YEAR – 10 DAY
DOWNSTREAM ULTIMATE STORAGE BASINS	10 DAY – 50 YEAR	10 DAY – 50 YEAR

NOTES:

1. MAJOR DRAINS GENERALLY SERVE AREAS IN EXCESS OF 100 ACRES. THESE DRAINS ARE DEFINED AND ANALYZED IN THE CITY'S STORM WATER MASTER PLAN.
2. MINOR DRAINS CONVEY RUNOFF TO THE MAJOR DRAINS AND GENERALLY SERVE AREAS LESS THAN 100 ACRES.
3. THE STORAGE VOLUME FOR DETENTION STORAGE IS BASED ON A 10-YEAR, 1-DAY STORM EVENT WITH A TOTAL RAINFALL OF 2.09 INCHES. THE BASIN SHALL ALSO ACCOMMODATE A 10-YEAR, 2-DAY EVENT WITH A TOTAL RAINFALL OF 2.64 INCHES WITH FREEBOARD AND PUMPING TAKEN INTO ACCOUNT. THE MAXIMUM DESIGN DEPTH AND SIDE SLOPES OF THE BASIN MUST BE APPROVED BY THE CITY. DISCHARGE PUMPS WITH A CITY APPROVED CAPACITY SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH CITY STORM WATER DISCHARGE POLICIES.
4. THE STORAGE VOLUME FOR RETENTION STORAGE IS BASED ON A 10-YEAR, 10-DAY STORM EVENT WITH A TOTAL RAIN FALL OF 4.17 INCHES. DISCHARGE PUMPS CAN ONLY BE INSTALLED AND OPERATED WITH THE APPROVAL OF THE CITY.
5. THE DESIGN WATER SURFACE ELEVATION IN A BASIN SHALL BE A MINIMUM OF ONE FOOT BELOW THE LOWEST CATCH BASIN IN THE AREA THAT IS TRIBUTARY TO THE BASIN.
6. THE CITY DOES NOT CONSIDER PERCOLATION/INFILTRATION FACTORS IN SIZING BASINS.

RATIONAL METHOD RUNOFF COEFFICIENTS AND DESIGN CRITERIA FOR STORM WATER BASINS

LAND USE	COEFFICIENT OF RUNOFF (C)	STORAGE VOLUME (ACRE-FEET/ACRE)	
		DETENTION	RETENTION
INDUSTRIAL AND COMMERCIAL	0.85	0.148	0.295
PROFESSIONAL OFFICE	0.65	0.113	0.226
RESIDENTIAL			
– HIGH DENSITY (15-29 UNITS/ACRE)	0.55	0.096	0.191
– MEDIUM DENSITY (11-14 UNITS/ACRE)	0.45	0.078	0.156
– LOW DENSITY (3-10 UNITS/ACRE)	0.35	0.061	0.122
– RURAL (1-2 UNITS/ACRE)	0.30	0.052	0.104
PUBLIC/INSTITUTIONAL	0.40	0.070	0.139
OPEN SPACE			
– IMPROVED (PARKS)	0.25	0.044	0.087
– UNIMPROVED	0.15	0.026	0.052

DESIGN CRITERIA

1. THE RATIONAL METHOD MAY BE USED TO DETERMINE PEAK FLOWS AND RUNOFF VOLUMES FOR AREAS LESS THAN 150 ACRES.
2. ALL NEW DEVELOPMENTS SHALL BE DESIGNED SUCH THAT THE SURFACE OF PONDED WATER DURING THE 100-YEAR RAINFALL EVENT DOES NOT RISE MORE THAN ONE FOOT ABOVE THE LOWEST TOP OF CURB IN THE DEVELOPMENT.
3. LOT TO STREET TIME = 25 MINUTES. (RESIDENTIAL ONLY)
4. GUTTER VELOCITY = 2 FEET PER SECOND.

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

DESIGN CRITERIA FOR DRAINAGE

REVISIONS
06/14/13
BK 2016

D-36

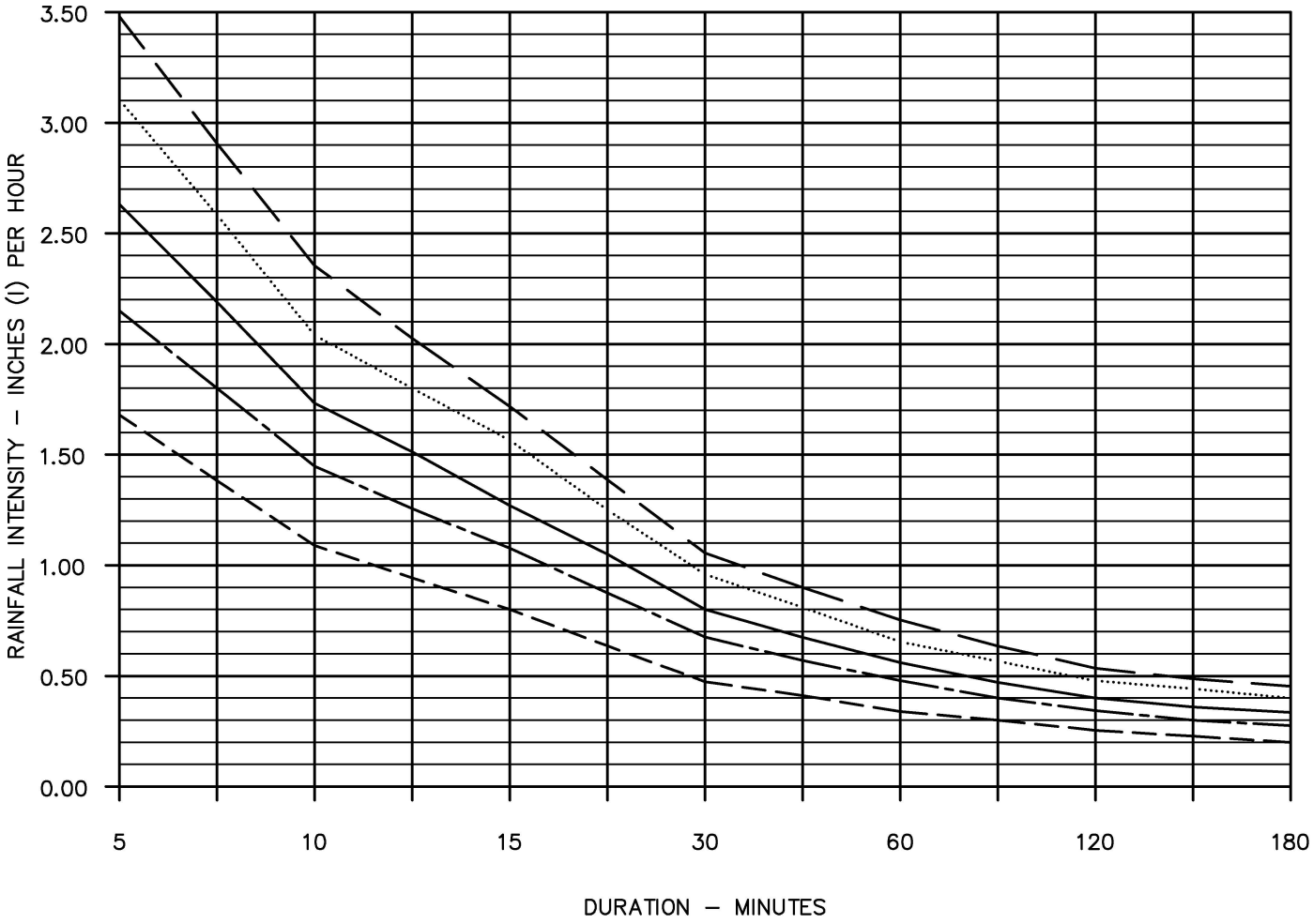
2 YEAR

5 YEAR

10 YEAR

25 YEAR

50 YEAR



APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

INTENSITY DURATION CURVES

REVISIONS
06/18/04
BK 2016

D–35

APPENDIX C

EXISTING CONDITIONS HYDROLOGIC PARAMETERS

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S0	12.83	89	3,653	0.020
S1	67.59	88	22,303	0.104
S10	14.50	89	6,134	0.383
S100	8.59	82	2,994	0.221
S101	23.81	89	8,295	0.380
S102	8.91	87	3,106	0.260
S103	2.75	89	957	0.435
S104	16.56	89	5,772	0.190
S105	10.68	88	3,720	0.253
S106	5.43	89	1,893	0.051
S107	6.75	89	2,351	0.342
S108	6.91	89	2,406	0.342
S109	82.30	89	28,679	0.330
S11	161.37	87	70,294	0.261
S110	6.95	89	2,422	0.190
S111	6.22	89	2,167	0.170
S112	7.31	86	2,548	0.128
S113	19.69	87	6,860	0.426
S114	7.12	84	2,482	0.699
S115	49.27	85	17,171	0.629
S116	31.41	89	10,947	0.159
S117	100.25	87	34,936	0.248
S118	104.39	90	45,473	0.261
S119	46.19	91	20,118	0.160
S12	41.52	84	7,697	0.316
S120	18.92	90	8,242	0.270
S121	81.51	90	35,505	0.212
S122	25.29	85	8,814	0.296
S123	3.91	87	1,704	0.205
S124	17.84	85	6,216	0.255
S125	34.73	84	12,104	0.310
S126	11.51	83	4,010	0.399
S127	14.35	89	5,000	0.296
S128	15.42	87	6,718	0.229
S129	6.08	86	2,650	0.320
S13	45.58	88	18,051	0.326
S130	35.92	84	15,644	0.175
S131	1.65	83	717	0.554
S132	13.74	87	5,985	0.381
S133	12.66	84	5,513	0.582
S134	13.38	89	4,662	0.339

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S135	72.92	84	25,411	0.448
S136	21.78	85	7,589	0.414
S137	11.03	84	3,844	0.318
S138	4.84	86	1,686	0.492
S139	17.78	86	6,195	0.713
S14	20.08	86	1,749	0.197
S140	10.73	84	3,740	1.048
S141	9.61	84	3,349	0.382
S142	10.56	83	3,681	0.170
S143	13.29	66	1,158	0.353
S144	1.24	89	1,805	0.181
S145	31.80	88	11,080	0.194
S146	87.12	84	30,359	0.410
S147	45.91	88	15,997	0.190
S148	14.49	89	5,051	0.193
S149	57.44	85	20,017	0.192
S15	17.81	90	7,533	0.399
S150	5.75	82	2,004	0.312
S151	6.04	83	2,104	0.335
S152	1.91	83	664	0.461
S153	18.56	82	6,466	0.260
S154	28.06	89	9,777	0.280
S155	67.89	84	23,657	0.188
S156	6.63	82	2,312	0.529
S157	5.56	84	1,937	0.185
S158	8.61	83	2,999	0.362
S159	2.64	83	920	0.402
S16	3.50	74	3,814	1.158
S160	17.28	83	6,021	0.463
S161	60.40	82	21,048	0.298
S162	24.39	83	8,499	0.352
S163	7.20	69	2,509	0.586
S164	14.25	88	4,966	0.129
S165	21.24	84	7,400	0.336
S166	25.07	88	8,737	0.293
S167	47.58	83	16,580	0.305
S168	6.20	84	2,161	0.252
S169	4.98	84	1,734	0.020
S17	19.35	86	6,433	0.849
S170	49.21	84	17,149	0.296
S171	3.88	84	1,352	0.247

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S172	22.71	82	1,979	0.084
S173	18.14	85	6,322	0.235
S174	7.01	84	2,441	0.568
S175	26.65	84	9,288	0.233
S176	13.57	89	4,728	0.181
S177	8.35	88	727	0.992
S178	40.30	84	14,044	0.243
S179	4.47	86	1,556	0.020
S18	10.82	89	4,171	0.331
S180	9.90	87	3,451	0.020
S181	2.25	82	784	0.020
S182	10.73	89	3,740	0.240
S183	22.51	89	7,845	0.026
S184	42.27	92	14,731	0.232
S185	4.24	88	1,479	0.217
S186	42.99	87	3,745	0.308
S187	38.41	83	13,385	0.284
S188	22.97	88	8,006	0.110
S189	20.61	87	7,182	0.159
S19	39.61	82	3,451	0.250
S190	43.96	84	15,319	0.259
S191	1.76	89	2,552	0.020
S192	88.12	85	30,709	0.183
S193	34.26	87	11,940	0.358
S194	24.78	83	8,634	0.559
S195	42.86	88	14,937	0.291
S196	13.51	84	4,708	0.341
S197	10.65	86	3,710	0.265
S198	18.82	86	1,639	0.226
S199	18.55	91	1,616	0.367
S2	10.75	88	4,335	0.185
S20	11.81	89	3,726	0.158
S200	8.93	81	7,776	1.548
S201	33.00	83	11,500	0.180
S202	23.26	83	3,377	0.247
S203	80.17	85	27,936	0.200
S204	38.79	82	3,380	0.378
S205	33.91	87	3,693	0.430
S206	21.15	68	1,843	0.390
S207	6.70	55	584	0.539
S208	8.56	85	2,984	0.259

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S209	64.24	87	22,386	0.263
S21	28.23	84	2,999	0.247
S210	17.07	84	5,949	0.187
S211	9.53	83	3,320	0.504
S212	37.58	82	8,185	0.326
S213	20.14	89	4,387	0.058
S214	41.29	87	14,390	0.219
S215	34.21	84	11,921	0.337
S216	23.22	82	5,058	0.355
S217	14.17	87	4,937	0.301
S218	30.43	87	10,603	0.289
S219	18.27	89	6,367	0.232
S22	2.86	87	1,038	0.317
S220	13.05	88	4,546	0.347
S221	13.69	87	1,704	0.659
S222	93.16	83	32,464	0.277
S223	4.78	89	1,664	0.516
S224	2.44	88	817	0.172
S225	3.81	90	1,659	0.492
S226	71.58	89	31,181	0.277
S227	3.40	90	1,481	0.344
S228	42.13	90	18,350	0.421
S229	8.73	84	3,042	0.209
S23	2.77	85	1,298	0.243
S230	14.68	82	5,115	0.365
S231	14.64	83	5,103	0.230
S232	13.52	84	4,711	0.306
S233	1.43	56	2,497	0.020
S234	6.99	82	2,437	0.237
S235	14.64	82	5,100	0.219
S236	25.56	81	8,907	0.252
S237	4.98	84	1,735	0.463
S238	16.55	87	1,442	0.569
S239	34.28	85	11,945	0.528
S24	7.61	84	2,351	0.285
S240	10.13	84	3,529	0.045
S241	9.38	68	817	0.374
S242	3.77	81	522	0.020
S243	20.82	56	1,814	0.771
S244	25.52	60	2,223	0.557
S245	9.00	85	3,135	0.304

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S246	9.67	45	842	0.109
S247	37.04	83	12,908	0.482
S248	127.96	86	11,148	0.514
S249	68.94	88	8,580	0.429
S25	19.87	88	7,153	0.308
S250	51.16	72	4,457	0.393
S251	67.27	82	23,442	0.914
S252	21.39	84	7,453	0.817
S253	31.39	89	10,939	0.403
S254	45.08	87	15,708	0.346
S255	27.58	88	9,613	0.748
S256	9.52	80	8,290	1.280
S257	7.61	87	2,650	0.355
S258	32.01	89	11,154	0.401
S259	42.35	84	14,760	0.310
S26	36.10	89	13,216	0.391
S260	7.95	84	2,772	0.388
S261	29.29	84	10,208	0.238
S262	15.82	88	5,514	0.480
S263	26.39	86	9,195	0.293
S264	11.09	88	3,865	0.224
S265	8.04	89	2,803	0.332
S266	9.41	89	3,279	0.293
S267	26.41	88	9,202	0.365
S268	12.15	89	5,292	0.502
S269	7.03	76	6,122	0.701
S27	21.34	89	8,452	0.434
S270	46.44	81	11,560	0.682
S271	21.70	89	9,454	0.542
S272	10.88	91	4,739	0.448
S273	30.43	90	13,257	0.339
S274	68.04	90	29,639	0.296
S275	31.81	83	11,086	0.368
S276	16.69	88	5,815	0.209
S277	14.14	84	2,053	0.323
S278	7.14	87	2,486	0.266
S279	14.43	81	5,030	0.303
S28	15.54	89	6,445	0.361
S280	32.22	88	11,230	0.297
S281	2.94	83	1,025	0.020
S282	12.96	83	4,516	0.224

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S283	22.19	81	4,833	0.439
S284	19.56	87	6,816	0.211
S285	15.47	81	5,391	0.377
S286	197.46	88	68,811	0.387
S287	69.17	86	24,105	0.594
S288	12.98	84	4,523	0.537
S289	11.86	88	2,066	0.136
S29	36.95	89	12,876	0.300
S290	130.82	86	45,588	0.254
S291	204.25	88	71,175	0.255
S292	190.91	89	66,528	0.263
S293	60.07	62	5,233	0.205
S294	25.67	84	8,945	0.188
S295	35.82	84	12,484	0.292
S296	1.97	84	686	0.186
S297	157.85	62	13,752	0.233
S298	24.30	84	8,468	0.229
S299	5.01	82	1,747	0.636
S3	25.33	89	8,173	0.223
S30	6.18	89	2,152	0.346
S300	16.60	83	5,785	0.743
S301	24.69	81	8,605	0.318
S302	10.93	84	4,762	1.083
S303	23.47	86	10,223	0.221
S304	36.47	85	12,708	0.230
S305	4.36	82	1,519	1.413
S306	13.30	83	4,635	0.562
S307	26.68	82	9,296	0.480
S308	25.93	85	9,037	0.345
S309	38.30	88	13,347	0.256
S31	10.11	89	3,521	0.773
S310	23.21	85	8,090	0.383
S311	45.25	83	15,769	0.317
S312	14.45	88	5,036	0.073
S313	10.17	86	3,545	0.291
S314	9.22	87	3,212	0.020
S315	4.18	84	1,455	0.020
S316	6.33	83	2,205	0.097
S317	28.33	85	9,873	0.287
S318	73.81	88	25,721	0.417
S319	30.26	77	2,636	0.258

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S32	17.05	88	1,486	1.519
S320	31.51	88	10,980	0.167
S321	18.66	85	5,420	0.288
S322	53.62	84	18,686	0.020
S323	5.48	83	1,911	0.305
S324	13.12	88	4,573	0.906
S325	11.85	89	4,131	0.179
S326	12.64	84	4,404	0.109
S327	48.42	82	16,874	0.528
S328	9.38	89	3,267	0.398
S329	23.96	89	8,349	0.276
S33	16.68	89	5,812	0.287
S330	16.04	89	5,589	0.338
S331	9.34	89	3,255	0.990
S332	4.67	88	4,065	1.486
S333	40.32	89	14,049	0.396
S334	41.19	89	14,355	0.207
S335	36.19	89	12,612	0.344
S336	14.34	88	4,998	0.020
S337	40.61	89	14,153	0.187
S338	41.69	88	14,529	0.319
S339	64.74	87	22,562	0.319
S34	4.24	89	1,476	0.374
S340	71.84	81	25,034	0.196
S341	17.31	70	7,539	2.513
S342	2.28	83	794	1.634
S343	3.68	83	1,281	0.788
S344	57.86	83	20,164	0.253
S345	18.03	87	6,281	0.384
S346	66.99	88	23,344	0.315
S347	35.62	86	12,411	0.105
S348	22.54	87	7,854	0.154
S349	11.73	88	4,087	0.020
S35	15.67	89	5,459	0.343
S350	72.50	89	25,264	0.260
S351	53.52	88	18,651	0.124
S352	116.60	88	25,396	0.251
S353	76.58	86	16,679	0.217
S354	44.09	88	15,363	0.284
S355	4.70	89	1,638	0.143
S356	2.68	89	935	0.217

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S357	8.53	88	2,974	0.181
S358	28.20	86	9,825	0.235
S359	16.10	88	5,612	0.214
S36	23.50	89	8,189	0.332
S360	8.00	89	2,787	0.429
S361	28.08	84	9,785	0.301
S362	23.63	84	8,234	0.331
S363	25.40	82	8,852	0.469
S364	39.87	86	13,892	0.497
S365	29.18	81	6,356	0.165
S366	23.57	87	8,214	0.217
S367	23.04	81	8,031	0.494
S368	24.14	84	8,411	0.196
S369	14.99	81	5,225	0.673
S37	15.92	89	5,549	0.221
S370	12.02	89	5,235	0.337
S371	11.90	78	1,037	0.020
S372	0.18	89	780	0.020
S373	13.75	87	4,793	0.314
S374	0.27	88	1,195	0.020
S375	32.36	89	11,278	0.291
S376	33.39	83	9,696	0.166
S377	168.88	74	14,713	0.302
S378	16.66	81	5,805	0.420
S379	3.67	81	3,193	0.545
S38	16.74	89	5,833	0.347
S380	72.54	84	25,277	0.334
S381	4.47	81	1,299	1.135
S382	43.42	63	6,877	0.791
S383	33.92	84	2,955	0.210
S384	8.59	81	748	0.215
S385	14.59	84	5,083	0.673
S386	30.43	84	10,605	0.272
S387	94.80	88	33,034	0.260
S388	37.40	88	13,034	0.143
S389	3.02	89	1,052	0.077
S39	33.77	88	11,768	0.296
S390	15.54	88	5,414	0.097
S391	13.76	86	5,992	0.493
S392	5.82	76	4,222	1.202
S393	25.46	89	8,872	0.263

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S394	18.12	81	1,579	0.227
S395	51.09	66	4,451	1.664
S396	53.09	84	8,660	0.395
S397	39.09	85	13,621	0.225
S398	67.40	87	23,487	0.329
S399	10.36	87	9,025	1.238
S4	12.08	89	4,209	0.141
S40	42.18	86	14,700	0.271
S400	62.50	88	21,780	0.249
S401	112.38	88	39,163	0.259
S402	16.91	88	14,732	0.354
S403	35.02	88	12,203	0.296
S404	1.26	88	1,098	0.461
S405	1.51	83	1,318	0.020
S406	1.87	89	1,630	0.020
S407	2.79	89	973	0.020
S408	9.36	84	3,262	0.661
S409	4.54	88	1,318	0.020
S41	23.86	88	8,314	0.315
S410	6.22	74	27,112	0.556
S411	64.04	88	27,897	0.355
S412	42.13	86	14,681	0.387
S413	17.01	89	5,927	0.409
S414	8.40	89	2,925	0.372
S415	4.74	89	1,653	0.212
S416	27.71	81	2,414	0.191
S417	35.40	81	3,084	0.168
S418	40.17	81	3,500	0.194
S419	16.72	81	2,914	0.325
S42	5.67	87	1,976	0.256
S420	99.33	81	8,653	0.572
S421	29.33	81	2,555	0.075
S422	4.15	87	3,616	0.020
S423	21.04	84	1,833	0.329
S424	17.85	85	7,773	0.322
S425	28.37	82	9,885	0.506
S426	18.81	82	6,555	0.302
S427	8.79	81	851	1.707
S428	13.90	85	1,211	0.513
S429	68.81	85	23,979	0.184
S43	7.19	79	3,197	0.989

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S430	41.59	87	14,492	0.214
S431	16.45	81	2,866	0.415
S432	17.15	89	5,978	0.438
S433	64.35	88	22,425	0.224
S434	11.18	85	3,895	0.161
S435	6.84	88	2,385	0.038
S436	77.71	88	27,081	0.251
S437	5.67	89	1,977	0.286
S438	13.73	87	4,783	0.145
S439	55.95	84	9,749	0.118
S44	4.52	87	1,575	0.387
S440	19.96	86	6,955	0.314
S441	19.31	87	6,730	0.247
S442	37.58	88	13,094	0.310
S443	5.80	89	2,022	0.163
S444	41.74	82	14,547	0.313
S445	57.39	87	20,000	0.342
S446	15.27	87	5,322	0.452
S447	21.23	90	9,248	0.240
S448	29.37	91	12,795	0.606
S449	19.48	90	8,484	0.306
S45	75.63	87	26,356	0.276
S450	4.45	90	1,938	0.374
S451	14.06	89	6,123	0.330
S452	14.34	92	6,247	0.199
S453	20.04	91	8,727	0.425
S454	38.93	92	16,959	0.998
S455	25.87	91	11,268	1.064
S456	4.46	84	1,555	0.400
S457	77.11	84	26,870	0.239
S458	9.19	91	4,002	0.150
S459	10.60	84	9,235	1.476
S46	35.60	83	12,407	0.308
S460	32.49	87	11,323	0.889
S461	19.22	88	6,698	0.355
S462	20.78	87	7,240	0.403
S463	38.39	88	3,344	0.456
S464	48.44	74	4,220	0.273
S465	27.40	91	11,936	0.332
S466	9.37	81	3,264	0.130
S467	35.47	81	12,361	0.393

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S468	7.04	84	2,452	0.327
S469	9.06	84	3,158	0.340
S47	15.15	88	5,279	0.507
S470	26.01	83	9,062	0.441
S471	36.40	84	12,686	0.307
S472	22.84	90	9,948	0.541
S473	18.77	91	8,176	0.807
S474	4.69	89	2,042	0.481
S475	5.96	86	519	0.273
S476	13.97	82	4,867	0.242
S477	26.15	84	9,114	0.465
S478	32.83	83	7,150	0.401
S479	5.43	89	2,363	0.215
S48	13.26	88	3,208	0.218
S480	103.79	87	36,169	0.256
S481	12.60	89	4,389	0.773
S482	34.96	89	12,183	0.377
S483	121.40	85	42,305	0.247
S484	12.06	89	4,204	0.058
S485	81.79	84	28,501	0.212
S486	41.89	87	18,248	0.274
S487	19.56	90	8,522	0.181
S488	21.95	89	9,561	0.270
S489	41.43	89	18,047	0.221
S49	42.42	85	14,782	0.331
S490	89.32	89	38,908	0.167
S491	7.93	89	3,456	0.239
S492	3.47	89	1,510	0.217
S493	21.86	90	9,523	0.189
S494	20.31	92	8,849	0.067
S495	6.08	91	2,648	0.031
S496	2.67	92	1,162	0.154
S497	10.62	92	4,625	0.297
S498	13.80	92	6,010	0.345
S499	47.08	88	16,406	0.207
S5	19.72	89	7,534	0.307
S50	28.10	84	9,792	0.264
S500	76.31	86	33,242	0.184
S501	8.14	88	1,364	0.562
S502	26.97	89	11,750	0.301
S503	20.33	81	1,771	0.164

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S504	15.99	90	6,967	0.237
S505	3.41	88	1,486	0.020
S506	9.39	90	4,091	0.178
S507	2.90	92	1,264	1.322
S508	11.10	89	4,836	0.191
S509	16.38	91	7,134	0.121
S51	5.18	89	1,803	0.145
S510	3.00	92	1,305	0.020
S511	3.10	91	1,348	0.020
S512	29.74	80	12,954	0.283
S513	7.42	82	3,231	0.062
S514	29.91	87	10,423	0.265
S515	31.95	85	11,135	0.346
S516	19.48	89	6,788	0.351
S517	59.34	85	20,680	0.253
S518	48.38	89	21,076	0.905
S519	0.87	89	473	0.769
S52	14.94	88	5,206	0.305
S520	37.30	89	12,997	0.682
S521	28.22	89	9,834	0.668
S522	58.76	90	20,477	0.320
S523	54.09	87	18,848	0.270
S524	38.82	89	13,527	0.309
S525	24.55	89	8,556	0.163
S526	51.53	87	17,957	0.247
S527	37.85	89	13,190	0.206
S528	31.50	89	10,979	0.164
S529	9.44	91	4,112	0.731
S53	62.61	88	21,819	0.259
S530	7.75	90	3,374	2.193
S531	38.79	90	16,895	0.510
S532	32.70	85	11,394	0.281
S533	127.49	83	44,428	0.217
S534	5.10	89	1,776	0.020
S535	34.60	87	12,056	0.221
S536	38.23	85	13,323	0.213
S537	3.98	87	1,387	0.081
S538	26.15	82	9,112	0.340
S539	4.58	86	1,596	1.078
S54	4.60	89	1,601	0.175
S540	32.37	86	11,280	0.196

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S541	26.81	88	9,342	0.240
S542	22.56	88	7,861	0.545
S543	6.70	85	2,336	1.534
S544	10.70	88	4,662	3.439
S545	85.28	89	29,719	0.247
S546	3.22	89	1,123	0.020
S547	58.93	89	20,536	0.227
S548	25.03	89	8,724	0.331
S549	21.98	90	7,660	0.231
S55	13.24	89	4,613	0.227
S550	31.39	88	10,938	0.260
S551	8.87	85	3,091	0.252
S552	85.27	88	29,716	0.233
S553	45.06	90	15,702	0.281
S554	29.70	89	12,935	0.250
S555	55.50	89	19,341	0.389
S556	78.99	90	34,407	0.368
S557	20.10	84	8,756	0.375
S558	7.83	89	6,825	1.525
S559	2.54	90	2,214	2.051
S56	14.14	89	4,926	0.214
S560	27.69	86	12,063	0.653
S561	11.28	91	4,911	2.206
S562	7.29	91	3,174	1.089
S563	7.46	88	2,598	0.382
S564	1.15	80	400	0.368
S565	3.67	88	3,197	0.217
S566	44.68	87	15,570	0.343
S567	39.68	88	13,828	0.430
S568	1.47	83	2,131	0.421
S569	4.01	89	1,397	0.020
S57	89.00	89	31,013	0.240
S570	26.10	83	9,094	0.399
S571	12.80	88	1,115	1.109
S572	4.49	88	1,566	1.478
S573	10.20	74	1,367	1.538
S574	26.59	87	9,265	0.301
S575	8.26	89	2,877	0.151
S576	22.21	88	7,740	0.432
S577	1.02	88	357	0.154
S578	2.42	89	843	0.093

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S579	2.92	89	1,272	0.293
S58	41.71	89	14,535	0.263
S580	13.40	86	4,668	0.265
S581	17.63	81	38,390	0.313
S582	8.39	88	18,274	0.020
S583	7.35	88	16,015	0.486
S584	10.98	86	23,908	0.020
S585	1.40	88	3,041	0.020
S586	33.48	86	8,333	0.298
S587	1.82	84	3,953	0.499
S588	2.11	88	4,593	0.554
S589	20.45	88	44,533	0.591
S59	48.71	89	16,973	0.260
S590	67.92	89	5,917	0.402
S591	41.87	87	4,053	0.185
S592	22.01	83	2,397	4.180
S593	25.09	79	2,186	0.320
S594	18.86	63	1,643	0.210
S595	34.88	86	3,575	0.755
S596	2.92	80	2,544	0.697
S597	24.76	88	5,394	0.451
S598	2.68	89	935	0.187
S599	21.02	86	2,289	0.134
S6	22.13	88	8,168	0.298
S60	9.34	89	3,255	0.179
S600	17.66	88	3,847	0.081
S601	9.30	89	3,239	0.020
S602	1.68	89	3,648	0.020
S603	10.06	82	1,947	0.318
S604	16.92	88	36,851	0.367
S605	1.71	89	3,731	0.020
S606	8.03	84	17,496	0.020
S607	73.47	92	32,005	0.531
S608	27.74	83	12,083	0.606
S609	12.86	90	28,010	0.465
S61	11.44	89	3,985	0.349
S610	4.28	84	9,323	0.450
S611	31.58	89	4,744	0.324
S612	3.86	86	1,344	0.474
S613	21.52	88	7,498	0.244
S614	2.60	87	905	0.876

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S615	1.71	89	596	0.243
S616	12.25	88	1,334	0.220
S617	4.36	89	9,486	0.264
S618	1.08	72	1,880	0.020
S619	26.95	89	11,741	0.378
S62	10.64	89	3,708	0.350
S620	2.43	90	5,283	0.020
S621	0.51	85	890	0.020
S622	0.26	89	454	0.020
S623	68.93	86	24,020	0.414
S624	64.96	88	18,863	0.212
S625	9.50	90	20,694	0.234
S626	10.55	90	22,983	0.312
S627	6.08	91	13,241	0.131
S628	24.84	86	10,820	0.438
S629	37.07	89	3,230	0.130
S63	16.12	89	5,617	0.251
S630	4.03	88	1,406	0.211
S631	41.18	85	5,979	0.294
S632	2.59	64	4,515	0.020
S633	2.39	85	5,194	0.020
S634	64.51	82	22,480	0.367
S635	12.64	63	7,866	0.391
S636	31.16	89	10,859	0.020
S637	16.68	89	5,811	0.020
S638	33.12	94	36,071	0.020
S639	34.46	92	37,528	0.020
S64	49.38	89	17,209	0.167
S640	32.72	74	35,636	0.020
S641	34.44	77	37,508	0.020
S642	241.18	68	21,012	0.262
S643	41.10	86	17,901	0.308
S644	18.82	89	6,558	0.313
S645	13.86	82	4,830	0.659
S646	26.99	89	2,351	0.045
S647	69.01	88	24,050	0.240
S648	130.18	60	11,341	0.285
S649	3.17	89	6,914	1.058
S65	13.21	89	4,602	0.208
S650	5.39	89	1,876	1.350
S651	2.04	89	711	3.585

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S652	20.29	91	8,840	0.418
S653	27.31	83	7,929	0.515
S654	21.35	89	9,300	0.326
S655	12.83	75	2,795	0.736
S656	7.28	90	3,171	0.026
S657	3.75	89	1,633	0.217
S658	1.19	83	2,590	0.020
S659	5.19	84	1,808	0.628
S66	43.47	89	15,147	0.230
S660	13.98	91	6,091	0.260
S661	24.64	87	8,587	0.248
S662	55.16	88	19,221	0.175
S663	194.12	88	67,646	0.264
S664	160.23	89	55,836	0.200
S665	39.58	86	13,793	0.345
S666	5.52	82	1,925	0.333
S667	15.47	83	5,390	0.511
S668	42.63	88	3,714	0.311
S669	13.04	89	4,544	0.595
S67	16.92	89	5,895	0.228
S670	12.80	88	4,460	0.373
S671	11.30	90	3,939	0.312
S672	27.80	83	9,687	0.332
S673	59.00	87	20,559	0.227
S674	3.11	87	6,775	0.286
S675	13.95	85	6,076	0.331
S676	73.85	92	32,171	0.234
S677	8.57	89	2,987	0.325
S678	4.02	89	1,402	0.479
S679	148.36	89	51,700	0.280
S68	6.60	90	2,298	0.177
S680	212.89	88	74,187	0.224
S681	21.07	88	1,836	0.253
S682	14.92	84	5,200	0.298
S683	10.19	88	3,552	0.020
S684	5.12	82	2,972	2.351
S685	28.07	89	6,987	0.197
S686	16.78	88	5,846	0.804
S687	1.32	88	2,875	0.020
S688	3.27	88	1,425	0.386
S689	2.64	87	1,916	2.778

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S69	5.28	89	605	0.287
S690	15.35	89	6,684	1.877
S691	10.24	88	3,570	0.377
S692	17.35	89	6,046	0.307
S693	5.15	89	1,793	0.430
S694	9.67	89	3,371	0.349
S695	3.61	89	1,258	0.300
S696	15.26	81	3,324	0.421
S697	11.68	82	4,069	0.346
S698	12.67	87	4,417	0.324
S699	8.39	84	2,924	0.282
S7	14.95	88	1,302	0.240
S70	20.14	90	3,508	0.216
S700	10.56	84	3,679	0.821
S701	8.98	81	3,128	0.528
S702	5.48	84	1,911	1.155
S703	124.78	73	10,871	0.394
S704	6.45	82	2,246	0.143
S705	35.70	88	12,442	0.180
S706	51.03	87	17,782	0.217
S71	22.44	89	7,820	0.163
S72	52.17	88	18,178	0.254
S73	5.87	81	1,137	0.903
S74	24.71	63	2,153	0.940
S75	43.89	86	3,823	0.277
S76	9.69	90	1,689	0.309
S77	7.88	89	3,433	0.282
S78	12.44	91	5,419	0.211
S79	36.48	86	3,178	0.207
S8	72.33	86	21,881	0.211
S80	22.39	89	9,755	0.589
S81	5.80	91	2,528	0.304
S82	3.71	91	1,615	0.281
S83	13.93	88	6,069	0.510
S84	4.57	81	1,990	0.326
S85	80.61	87	28,091	0.285
S86	24.46	87	8,523	0.020
S87	38.60	86	13,451	0.760
S88	4.74	79	4,132	2.209
S89	15.11	90	1,317	0.398
S9	79.08	87	20,876	0.238

Table C-1. Existing Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S90	15.14	87	6,595	0.362
S91	20.93	87	7,294	0.220
S92	22.06	83	7,688	0.254
S93	24.13	84	8,408	0.321
S94	18.53	85	6,456	0.137
S95	7.24	85	2,523	0.302
S96	3.92	81	727	0.109
S97	45.23	85	15,763	0.325
S98	58.99	85	20,557	0.164
S99	13.98	89	4,871	0.260
SGreystone	46.06	84	8,090	0.383

APPENDIX D

FUTURE CONDITIONS HYDROLOGIC PARAMETERS

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
Lowery	52.74	80	8,660	0.395
S0	12.83	89	3,653	0.020
S1	67.59	88	22,303	0.104
S10	14.50	89	6,134	0.383
S100	8.59	82	2,994	0.221
S101	23.81	89	8,295	0.380
S102	8.91	88	3,106	0.260
S103	2.75	89	957	0.435
S104	16.56	89	5,772	0.190
S105	10.68	88	3,720	0.253
S106	5.43	89	1,893	0.051
S107	6.75	89	2,351	0.342
S108	6.91	89	2,406	0.342
S109	82.30	89	28,679	0.330
S11	161.37	87	70,294	0.261
S110	6.95	89	2,422	0.190
S111	6.22	89	2,167	0.170
S112	7.31	86	2,548	0.128
S113	19.69	87	6,860	0.426
S114	7.12	84	2,482	0.699
S115	49.27	85	17,171	0.629
S116	31.41	89	10,947	0.159
S117	100.25	89	34,936	0.248
S118	104.39	90	45,473	0.261
S119	46.19	91	20,118	0.160
S12	41.52	84	7,697	0.316
S120	18.92	91	8,242	0.270
S121	81.51	91	35,505	0.212
S122	25.29	85	8,814	0.296
S123	3.91	87	1,704	0.205
S124	17.84	85	6,216	0.255
S125	34.73	84	12,104	0.310
S126	11.51	83	4,010	0.399
S127	14.35	89	5,000	0.296
S128	15.42	88	6,718	0.229
S129	6.08	86	2,650	0.320
S13	45.58	89	18,051	0.326
S130	35.92	87	15,644	0.175
S131	1.65	84	717	0.554
S132	13.74	87	5,985	0.381
S133	12.66	84	5,513	0.582

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S134	13.38	89	4,662	0.339
S135	82.03	87	28,586	0.448
S136	21.78	85	7,589	0.414
S137	11.03	84	3,844	0.318
S138	4.84	86	1,686	0.492
S139	17.78	86	6,195	0.713
S14	20.08	88	1,749	0.197
S140	10.73	84	3,740	1.048
S141	7.99	84	2,785	0.595
S142	6.87	88	2,394	0.163
S143	13.39	87	4,666	0.323
S144	1.24	89	1,805	0.181
S145	18.20	88	6,343	0.149
S146	46.41	84	16,171	0.464
S147	45.91	88	15,997	0.190
S148	14.49	89	5,051	0.193
S149	57.44	85	20,017	0.192
S15	17.81	90	7,533	0.399
S150	5.75	82	2,004	0.312
S151	6.04	83	2,104	0.335
S152	1.91	83	664	0.461
S153	18.56	82	6,466	0.260
S154	28.06	89	9,777	0.280
S155	67.89	84	23,657	0.188
S156	6.63	82	2,312	0.529
S157	5.56	84	1,937	0.185
S158	8.61	83	2,999	0.362
S159	2.64	83	920	0.402
S16	3.50	74	3,814	1.158
S160	17.28	83	6,021	0.463
S161	60.40	82	21,048	0.298
S162	24.39	83	8,499	0.352
S163	7.20	69	2,509	0.586
S164	14.25	88	4,966	0.129
S165	21.24	84	7,400	0.336
S166	25.07	88	8,737	0.293
S167	47.58	88	16,580	0.305
S168	6.20	84	2,161	0.252
S169	4.98	84	1,734	0.020
S17	19.35	86	6,433	0.849
S170	19.30	84	6,727	0.342

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S171	3.88	84	1,352	0.247
S172	22.71	90	1,979	0.084
S173	18.14	85	6,322	0.235
S174	7.01	84	2,441	0.568
S175	17.66	89	6,154	0.225
S176	13.57	89	4,728	0.181
S177	8.35	88	727	0.992
S178	40.30	84	14,044	0.243
S179	4.47	86	1,556	0.020
S18	10.82	89	4,171	0.331
S180	9.90	88	3,451	0.020
S181	2.25	82	784	0.020
S182	10.73	89	3,740	0.240
S183	22.51	89	7,845	0.026
S184	42.27	92	14,731	0.232
S185	4.24	88	1,479	0.217
S186	42.99	87	3,745	0.308
S187	38.41	83	13,385	0.284
S188	22.97	88	8,006	0.110
S189	20.61	87	7,182	0.159
S19	39.61	89	3,451	0.250
S190	43.96	84	15,319	0.259
S191	1.76	89	2,552	0.020
S192	88.12	87	30,709	0.183
S193	34.26	87	11,940	0.358
S194	24.78	83	8,634	0.559
S195	42.86	88	14,937	0.291
S196	13.51	84	4,708	0.341
S197	10.65	86	3,710	0.265
S198	18.82	86	1,639	0.226
S199	18.55	91	1,616	0.367
S2	10.75	88	4,335	0.185
S20	11.81	89	3,726	0.158
S200	8.93	81	7,776	1.548
S201	33.00	89	11,500	0.180
S202	23.26	89	3,377	0.247
S203	80.17	90	27,936	0.200
S204	38.79	82	3,380	0.378
S205	33.91	89	3,693	0.430
S206	21.15	75	1,843	0.390
S207	6.70	80	584	0.539

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S208	8.56	85	2,984	0.259
S209	64.24	88	22,386	0.263
S21	28.23	90	2,999	0.247
S210	17.07	84	5,949	0.187
S211	9.53	83	3,320	0.504
S212	37.58	88	8,185	0.326
S213	20.14	89	4,387	0.058
S214	41.29	88	14,390	0.219
S215	34.21	84	11,921	0.337
S216	23.22	82	5,058	0.355
S217	14.17	87	4,937	0.301
S218	30.43	87	10,603	0.289
S219	18.27	89	6,367	0.232
S22	2.86	88	1,038	0.317
S220	13.05	88	4,546	0.347
S221	13.69	87	1,704	0.659
S222	93.16	89	32,464	0.277
S223	4.78	89	1,664	0.516
S224	2.44	88	817	0.172
S225	3.81	92	1,659	0.492
S226	71.58	90	31,181	0.277
S227	3.40	92	1,481	0.344
S228	42.13	92	18,350	0.421
S229	8.73	84	3,042	0.209
S23	2.77	88	1,298	0.243
S230	16.78	82	5,847	0.369
S231	14.64	83	5,103	0.230
S232	13.52	84	4,711	0.306
S233	1.43	81	2,497	0.020
S234	6.99	82	2,437	0.237
S235	14.64	82	5,100	0.219
S236	7.44	81	2,593	0.115
S237	4.98	84	1,735	0.463
S238	9.15	88	3,190	0.368
S239	8.45	85	2,945	0.554
S24	7.61	88	2,351	0.285
S240	10.13	84	3,529	0.045
S241	9.38	86	817	0.374
S242	3.77	81	522	0.020
S243	19.40	77	6,761	0.771
S243b	1.41	81	490	0.771

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S244	25.52	71	2,223	0.557
S245	9.00	85	3,135	0.304
S246	9.67	82	842	0.109
S247	37.04	85	12,908	0.482
S248	127.96	86	11,148	0.514
S249	68.94	88	8,580	0.429
S25	19.87	88	7,153	0.308
S250	51.16	72	4,457	0.393
S251	67.27	82	23,442	0.914
S252	21.39	84	7,453	0.817
S253	31.39	89	10,939	0.403
S254	45.08	88	15,708	0.346
S255	27.58	88	9,613	0.748
S256	9.52	88	8,290	1.280
S257	7.61	88	2,650	0.355
S258	32.01	89	11,154	0.401
S259	42.35	88	14,760	0.310
S26	36.10	89	13,216	0.391
S260	7.95	88	2,772	0.388
S261	29.29	88	10,208	0.238
S262	15.82	88	5,514	0.480
S263	26.39	89	9,195	0.293
S264	11.09	88	3,865	0.224
S265	8.04	89	2,803	0.332
S266	9.41	89	3,279	0.293
S267	26.41	89	9,202	0.365
S268	12.15	89	5,292	0.502
S269	7.03	76	6,122	0.701
S27	21.34	89	8,452	0.434
S270	46.44	87	11,560	0.682
S271	21.70	90	9,454	0.542
S272	10.88	91	4,739	0.448
S273	30.43	90	13,257	0.339
S274	68.04	91	29,639	0.296
S275	31.81	83	11,086	0.368
S276	16.69	88	5,815	0.209
S277	14.14	88	2,053	0.323
S278	7.14	87	2,486	0.266
S279	14.43	81	5,030	0.303
S28	15.54	89	6,445	0.361
S280	32.22	88	11,230	0.297

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S281	2.94	84	1,025	0.020
S282	12.96	83	4,516	0.224
S283	16.71	81	5,823	0.381
S284	19.56	88	6,816	0.211
S285	15.47	81	5,391	0.377
S286	197.46	88	68,811	0.387
S287	69.17	86	24,105	0.594
S288	12.98	88	4,523	0.537
S289	11.86	91	2,066	0.136
S29	36.95	89	12,876	0.300
S290	130.82	89	45,588	0.254
S291	204.25	89	71,175	0.255
S292	190.91	89	66,528	0.263
S293	60.07	75	5,233	0.205
S294	25.67	84	8,945	0.188
S295	35.82	84	12,484	0.292
S296	1.97	84	686	0.186
S297	157.85	67	13,752	0.233
S298	24.30	84	8,468	0.229
S299	5.01	82	1,747	0.636
S3	25.33	89	8,173	0.223
S30	6.18	89	2,152	0.346
S300	16.60	83	5,785	0.743
S301	24.69	81	8,605	0.318
S302	10.93	84	4,762	1.083
S303	23.47	87	10,223	0.221
S304	36.47	85	12,708	0.230
S305	4.36	82	1,519	1.413
S306	13.30	83	4,635	0.562
S307	26.68	82	9,296	0.480
S308	39.76	85	13,856	0.345
S309	38.30	88	13,347	0.256
S31	10.11	89	3,521	0.773
S310	23.22	85	8,090	0.383
S311	50.04	86	17,438	0.317
S312	21.16	88	7,371	0.073
S313	10.17	88	3,545	0.291
S314	9.22	88	3,212	0.020
S315	4.18	88	1,455	0.020
S316	6.33	88	2,205	0.097
S317	28.33	85	9,873	0.287

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S318	73.81	88	25,721	0.417
S319	30.26	89	2,636	0.258
S32	17.05	88	1,486	1.519
S320	31.51	88	10,980	0.167
S321	18.66	88	5,420	0.288
S322	53.62	84	18,686	0.020
S323	5.48	83	1,911	0.305
S324	13.12	88	4,573	0.906
S325	11.85	89	4,131	0.179
S326	12.64	84	4,404	0.109
S327	48.42	87	16,874	0.528
S328	9.38	89	3,267	0.398
S329	23.96	89	8,349	0.276
S33	16.68	89	5,812	0.287
S330	16.04	89	5,589	0.338
S331	9.34	89	3,255	0.990
S332	4.67	88	4,065	1.486
S333	40.32	89	14,049	0.396
S334	41.19	89	14,355	0.207
S335	36.19	89	12,612	0.344
S336	14.34	88	4,998	0.020
S337	40.61	89	14,153	0.187
S338	41.69	88	14,529	0.319
S339	64.74	88	22,562	0.319
S34	4.24	89	1,476	0.374
S340	71.84	81	25,034	0.196
S341	17.31	70	7,539	2.513
S342	2.28	83	794	1.634
S343	3.68	83	1,281	0.788
S344	57.86	88	20,164	0.253
S345	18.03	87	6,281	0.384
S346	66.99	88	23,344	0.315
S347	35.62	86	12,411	0.105
S348	22.54	88	7,854	0.154
S349	11.73	88	4,087	0.020
S35	15.67	89	5,459	0.343
S350	72.50	89	25,264	0.260
S351	53.52	88	18,651	0.124
S352	105.11	88	36,629	0.251
S353	76.58	86	16,679	0.217
S354	44.09	88	15,363	0.284

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S355	4.70	89	1,638	0.143
S356	2.68	89	935	0.217
S357	8.53	88	2,974	0.181
S358	28.20	87	9,825	0.235
S359	16.10	90	5,612	0.214
S36	23.50	89	8,189	0.332
S360	8.00	89	2,787	0.429
S361	28.08	88	9,785	0.301
S362	23.63	84	8,234	0.331
S363	25.40	82	8,852	0.469
S364	39.87	86	13,892	0.497
S365	29.18	87	6,356	0.165
S366	23.57	87	8,214	0.217
S367	23.04	81	8,031	0.494
S368	24.14	84	8,411	0.196
S369	14.99	81	5,225	0.673
S37	15.92	89	5,549	0.221
S370	12.02	92	5,235	0.337
S371	11.90	90	1,037	0.020
S372	0.18	89	780	0.020
S373	13.75	88	4,793	0.314
S374	0.27	90	1,195	0.020
S375	32.36	89	11,278	0.291
S376	33.39	89	9,696	0.166
S377	22.70	90	7,910	0.648
S378	16.66	81	5,805	0.420
S379	3.67	81	3,193	0.545
S38	16.74	89	5,833	0.347
S380	72.54	84	25,277	0.334
S381	4.47	81	1,299	1.135
S382	43.42	71	6,877	0.791
S383	33.92	88	2,955	0.210
S384	8.59	81	748	0.215
S385	14.59	84	5,083	0.673
S386	30.43	84	10,605	0.272
S387	94.80	88	33,034	0.260
S388	37.40	88	13,034	0.143
S389	3.02	89	1,052	0.077
S39	33.77	88	11,768	0.296
S390	15.54	88	5,414	0.097
S391	13.76	86	5,992	0.493

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S392	5.82	85	4,222	1.202
S393	25.46	89	8,872	0.263
S394	18.12	81	1,579	0.227
S395	51.09	66	4,451	1.664
S396	45.87	84	8,660	0.395
S397	39.09	85	13,621	0.225
S398	67.40	88	23,487	0.329
S399	10.36	88	9,025	1.238
S4	12.08	89	4,209	0.141
S40	42.18	86	14,700	0.271
S400	62.50	88	21,780	0.249
S401	112.38	88	39,163	0.259
S402	16.91	92	14,732	0.354
S403	35.02	88	12,203	0.296
S404	1.26	88	1,098	0.461
S405	1.51	83	1,318	0.020
S406	1.87	89	1,630	0.020
S407	2.79	89	973	0.020
S408	9.36	84	3,262	0.661
S409	4.54	88	1,318	0.020
S41	23.86	88	8,314	0.315
S410	6.22	74	27,112	0.556
S411	64.04	88	27,897	0.355
S412	42.13	89	14,681	0.387
S413	17.01	89	5,927	0.409
S414	8.40	89	2,925	0.372
S415	4.74	89	1,653	0.212
S416	27.71	81	2,414	0.191
S417	35.40	81	3,084	0.168
S418	40.17	81	3,500	0.194
S419	16.72	81	2,914	0.325
S42	5.67	87	1,976	0.256
S420	99.33	82	8,653	0.572
S421	29.33	84	2,555	0.075
S422	4.15	88	3,616	0.020
S423	21.04	84	1,833	0.329
S424	17.85	88	7,773	0.322
S425	28.37	82	9,885	0.506
S426	18.81	82	6,555	0.302
S427	8.79	81	851	1.707
S428	13.90	85	1,211	0.513

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S429	68.81	85	23,979	0.184
S43	7.19	79	3,197	0.989
S430	27.75	87	9,670	0.214
S431	16.45	81	2,866	0.415
S432	17.15	89	5,978	0.438
S433	64.35	88	22,425	0.224
S434	11.18	86	3,895	0.161
S435	6.84	88	2,385	0.038
S436	77.71	88	27,081	0.251
S437	5.67	89	1,977	0.286
S438	13.73	88	4,783	0.145
S439	55.95	84	9,749	0.118
S44	4.52	87	1,575	0.387
S440	19.96	86	6,955	0.314
S441	19.31	88	6,730	0.247
S442	37.58	88	13,094	0.310
S443	5.80	89	2,022	0.163
S444	41.74	88	14,547	0.313
S445	57.39	87	20,000	0.342
S446	15.27	87	5,322	0.452
S447	21.23	90	9,248	0.240
S448	29.37	91	12,795	0.606
S449	19.48	90	8,484	0.306
S45	75.63	88	26,356	0.276
S450	4.45	91	1,938	0.374
S451	14.06	91	6,123	0.330
S452	14.34	92	6,247	0.199
S453	20.04	92	8,727	0.425
S454	38.93	92	16,959	0.998
S455	25.87	91	11,268	1.064
S456	4.46	88	1,555	0.400
S457	77.11	89	26,870	0.239
S458	9.19	92	4,002	0.150
S459	10.60	84	9,235	1.476
S46	35.60	83	12,407	0.308
S460	32.49	87	11,323	0.889
S461	19.22	88	6,698	0.355
S462	20.78	87	7,240	0.403
S463	38.39	89	3,344	0.456
S464	48.44	88	4,220	0.273
S465	27.40	91	11,936	0.332

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S466	9.37	81	3,264	0.130
S467	35.47	81	12,361	0.393
S468	7.04	84	2,452	0.327
S469	9.06	84	3,158	0.340
S47	15.15	88	5,279	0.507
S470	26.01	83	9,062	0.441
S471	36.40	84	12,686	0.307
S472	22.84	92	9,948	0.541
S473	18.77	91	8,176	0.807
S474	4.69	89	2,042	0.481
S475	5.96	86	519	0.273
S476	13.97	82	4,867	0.242
S477	26.15	84	9,114	0.465
S478	32.83	83	7,150	0.401
S479	5.43	89	2,363	0.215
S48	13.26	88	3,208	0.218
S480	103.79	87	36,169	0.256
S481	12.60	89	4,389	0.773
S482	34.96	89	12,183	0.377
S483	121.40	90	42,305	0.247
S484	12.06	89	4,204	0.058
S485	81.79	84	28,501	0.212
S486	41.89	88	18,248	0.274
S487	19.56	90	8,522	0.181
S488	21.95	89	9,561	0.270
S489	41.43	89	18,047	0.221
S49	42.42	90	14,782	0.331
S490	89.32	89	38,908	0.167
S491	7.93	89	3,456	0.239
S492	3.47	92	1,510	0.217
S493	21.86	91	9,523	0.189
S494	20.31	92	8,849	0.067
S495	6.08	92	2,648	0.031
S496	2.67	92	1,162	0.154
S497	10.62	92	4,625	0.297
S498	13.80	92	6,010	0.345
S499	47.08	89	16,406	0.207
S5	19.72	89	7,534	0.307
S50	28.10	88	9,792	0.264
S500	76.31	90	33,242	0.184
S501	8.14	88	1,364	0.562

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S502	26.97	92	11,750	0.301
S503	15.28	92	5,325	0.147
S504	15.99	92	6,967	0.237
S505	3.41	92	1,486	0.020
S506	9.39	92	4,091	0.178
S507	2.90	92	1,264	1.322
S508	11.10	92	4,836	0.191
S509	16.38	91	7,134	0.121
S51	5.18	89	1,803	0.145
S510	3.00	92	1,305	0.020
S511	3.10	92	1,348	0.020
S512	29.74	92	12,954	0.283
S513	7.42	91	3,231	0.062
S514	29.91	87	10,423	0.265
S515	31.95	87	11,135	0.346
S516	19.48	89	6,788	0.351
S517	59.34	89	20,680	0.253
S518	48.38	89	21,076	0.905
S519	0.87	89	473	0.769
S52	14.94	88	5,206	0.305
S520	37.30	89	12,997	0.682
S521	28.22	89	9,834	0.668
S522	58.76	90	20,477	0.320
S523	54.09	89	18,848	0.270
S524	38.82	89	13,527	0.309
S525	24.55	89	8,556	0.163
S526	51.53	90	17,957	0.247
S527	37.85	89	13,190	0.206
S528	31.50	89	10,979	0.164
S529	9.44	92	4,112	0.731
S53	62.61	91	21,819	0.259
S530	7.75	91	3,374	2.193
S531	38.79	91	16,895	0.510
S532	32.70	85	11,394	0.281
S533	57.93	83	20,189	0.135
S534	5.10	89	1,776	0.020
S535	34.60	88	12,056	0.221
S536	38.23	85	13,323	0.213
S537	3.98	87	1,387	0.081
S538	26.15	85	9,112	0.340
S539	4.58	86	1,596	1.078

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S54	4.60	89	1,601	0.175
S540	32.37	86	11,280	0.196
S541	26.81	88	9,342	0.240
S542	22.56	88	7,861	0.545
S543	6.70	85	2,336	1.534
S544	10.70	89	4,662	3.439
S545	85.28	89	29,719	0.247
S546	3.22	89	1,123	0.020
S547	58.93	89	20,536	0.227
S548	25.03	89	8,724	0.331
S549	21.98	90	7,660	0.231
S55	13.24	89	4,613	0.227
S550	31.39	88	10,938	0.260
S551	8.87	85	3,091	0.252
S552	85.27	88	29,716	0.233
S553	45.06	90	15,702	0.281
S554	29.70	89	12,935	0.250
S555	55.50	90	19,341	0.389
S556	78.99	90	34,407	0.368
S557	20.10	89	8,756	0.375
S558	7.83	89	6,825	1.525
S559	2.54	90	2,214	2.051
S56	14.14	89	4,926	0.214
S560	27.69	86	12,063	0.653
S561	11.28	91	4,911	2.206
S562	7.29	91	3,174	1.089
S563	7.46	88	2,598	0.382
S564	1.15	80	400	0.368
S565	3.67	88	3,197	0.217
S566	44.68	87	15,570	0.343
S567	39.68	88	13,828	0.430
S568	1.47	83	2,131	0.421
S569	4.01	89	1,397	0.020
S57	89.00	89	31,013	0.240
S570	26.10	87	9,094	0.399
S571	12.80	88	1,115	1.109
S572	4.49	88	1,566	1.478
S573	10.20	74	1,367	1.538
S574	26.59	87	9,265	0.301
S575	8.26	89	2,877	0.151
S576	22.21	88	7,740	0.432

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S577	1.02	88	357	0.154
S578	2.42	89	843	0.093
S579	2.92	89	1,272	0.293
S58	41.71	89	14,535	0.263
S580	13.40	86	4,668	0.265
S581	17.63	91	38,390	0.313
S582	8.39	92	18,274	0.020
S583	7.35	92	16,015	0.486
S584	10.98	91	23,908	0.020
S585	1.40	91	3,041	0.020
S586	33.48	90	8,333	0.298
S587	1.82	88	3,953	0.499
S588	2.11	88	4,593	0.554
S589	20.45	90	44,533	0.591
S59	48.71	89	16,973	0.260
S590	67.92	91	5,917	0.402
S591	41.87	89	4,053	0.185
S592	22.01	91	2,397	4.180
S593	25.09	91	2,186	0.320
S594	18.86	88	1,643	0.210
S595	34.88	91	3,575	0.755
S596	2.92	93	2,544	0.697
S597	24.76	92	5,394	0.451
S598	2.68	89	935	0.187
S599	21.02	87	2,289	0.134
S6	22.13	88	8,168	0.298
S60	9.34	89	3,255	0.179
S600	17.66	89	3,847	0.081
S601	9.30	89	3,239	0.020
S602	1.68	89	3,648	0.020
S603	10.06	88	1,947	0.318
S604	16.92	92	36,851	0.367
S605	1.71	92	3,731	0.020
S606	8.03	90	17,496	0.020
S607	73.47	93	32,005	0.531
S608	27.74	92	12,083	0.606
S609	12.86	92	28,010	0.465
S61	11.44	89	3,985	0.349
S610	4.28	93	9,323	0.450
S611	31.58	89	4,744	0.324
S612	3.86	88	1,344	0.474

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S613	21.52	89	7,498	0.244
S614	2.60	88	905	0.876
S615	1.71	89	596	0.243
S616	12.25	88	1,334	0.220
S617	4.36	89	9,486	0.264
S618	1.08	91	1,880	0.020
S619	26.95	92	11,741	0.378
S62	10.64	89	3,708	0.350
S620	2.43	92	5,283	0.020
S621	0.51	92	890	0.020
S622	0.26	92	454	0.020
S623	68.93	86	24,020	0.414
S624	20.35	88	7,091	0.110
S625	9.50	92	20,694	0.234
S626	10.55	92	22,983	0.312
S627	6.08	92	13,241	0.131
S628	24.84	92	10,820	0.438
S629	37.07	92	3,230	0.130
S63	16.12	89	5,617	0.251
S630	4.03	88	1,406	0.211
S631	22.12	85	7,708	0.100
S632	2.59	84	4,515	0.020
S633	2.39	88	5,194	0.020
S634	64.51	84	22,480	0.367
S635	12.64	63	7,866	0.391
S636	31.16	89	10,859	0.020
S637	16.68	89	5,811	0.020
S638	33.12	3	36,071	0.020
S639	34.46	3	37,528	0.020
S64	49.38	89	17,209	0.167
S640	32.72	3	35,636	0.020
S641	34.44	3	37,508	0.020
S642	123.49	71	10,758	0.262
S643	41.10	92	17,901	0.308
S644	18.82	89	6,558	0.313
S645	13.86	82	4,830	0.659
S646	26.99	89	2,351	0.045
S647	69.01	88	24,050	0.240
S648	130.18	79	11,341	0.285
S649	3.17	89	6,914	1.058
S65	13.21	89	4,602	0.208

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S650	5.39	89	1,876	1.350
S651	2.04	89	711	3.585
S652	20.29	92	8,840	0.418
S653	27.31	83	7,929	0.515
S654	21.35	89	9,300	0.326
S655	12.83	79	2,795	0.736
S656	7.28	92	3,171	0.026
S657	3.75	92	1,633	0.217
S658	1.19	83	2,590	0.020
S659	5.19	84	1,808	0.628
S66	43.47	89	15,147	0.230
S660	13.98	92	6,091	0.260
S661	24.64	88	8,587	0.248
S662	55.16	89	19,221	0.175
S663	194.12	88	67,646	0.264
S664	160.23	89	55,836	0.200
S665	39.58	89	13,793	0.345
S666	5.52	82	1,925	0.333
S667	15.47	83	5,390	0.511
S668	42.63	88	3,714	0.311
S669	13.04	89	4,544	0.595
S67	16.92	89	5,895	0.228
S670	12.80	91	4,460	0.373
S671	11.30	92	3,939	0.312
S672	27.80	83	9,687	0.332
S673	59.00	87	20,559	0.227
S674	3.11	89	6,775	0.286
S675	13.95	85	6,076	0.331
S676	73.85	92	32,171	0.234
S677	8.57	89	2,987	0.325
S678	4.02	89	1,402	0.479
S679	148.36	89	51,700	0.280
S68	6.60	90	2,298	0.177
S680	212.89	88	74,187	0.224
S681	21.07	89	1,836	0.253
S682	14.92	88	5,200	0.298
S683	10.19	88	3,552	0.020
S684	5.12	88	2,972	2.351
S685	28.07	89	6,987	0.197
S686	16.78	88	5,846	0.804
S687	1.32	88	2,875	0.020

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S688	3.27	88	1,425	0.386
S689	2.64	87	1,916	2.778
S69	5.28	89	605	0.287
S690	15.35	89	6,684	1.877
S691	10.24	88	3,570	0.377
S692	17.35	89	6,046	0.307
S693	5.15	89	1,793	0.430
S694	9.67	89	3,371	0.349
S695	3.61	89	1,258	0.300
S696	15.26	83	3,324	0.421
S697	11.68	82	4,069	0.346
S698	12.67	88	4,417	0.324
S699	8.39	84	2,924	0.282
S7	14.95	89	1,302	0.240
S70	20.14	91	3,508	0.216
S700	10.56	84	3,679	0.821
S701	8.98	81	3,128	0.528
S702	5.48	84	1,911	1.155
S703	124.78	73	10,871	0.394
S704	6.45	82	2,246	0.143
S705	35.70	89	12,442	0.180
S706	51.03	88	17,782	0.217
S707	41.68	81	14,523	0.180
S708	121.91	81	42,484	0.178
S709E	54.82	86	19,104	0.210
S709W	24.31	88	8,472	0.210
S71	22.44	89	7,820	0.163
S710	108.30	84	37,739	0.245
S711	40.76	87	14,204	0.061
S712	32.35	84	11,274	0.061
S713	55.00	76	19,166	0.210
S714	57.25	82	19,951	0.604
S715	160.25	79	55,842	0.174
S716	130.67	84	45,536	0.086
S717	67.23	77	23,428	0.335
S718	39.79	68	13,867	0.382
S719	100.93	88	43,712	0.206
S719B	24.69	68	500	0.500
S72	52.17	89	18,178	0.254
S722	74.19	82	25,853	0.129
S723	65.49	81	22,823	0.269

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S724	122.83	85	42,802	0.093
S726	23.79	55	8,289	0.182
S727	7.25	82	2,526	0.100
S728	17.96	52	6,259	0.368
S729	61.94	74	21,584	0.221
S73	5.87	81	1,137	0.903
S730	136.93	55	47,717	0.324
S731	30.35	89	13,220	0.083
S731E	41.05	92	17,881	0.211
S731S	12.74	90	5,550	0.083
S731W	31.78	92	13,843	0.211
S732	23.06	86	8,035	0.076
S733	35.90	92	12,511	0.055
S734	34.62	92	12,064	0.055
S735	41.99	90	14,631	0.233
S736	15.58	87	5,430	0.313
S737	26.50	83	9,235	0.513
S738	17.14	81	5,973	0.566
S739	36.45	74	12,700	0.357
S74	24.71	84	2,153	0.940
S740	38.21	61	13,315	0.312
S741	36.82	66	12,832	0.355
S742	25.11	39	8,752	0.304
S743	53.69	88	18,708	0.311
S744NE	23.11	88	8,053	0.424
S744SW	23.50	89	8,189	0.424
S745	29.02	68	10,112	0.190
S746	22.93	79	7,992	0.311
S747	20.24	89	7,053	0.056
S748	22.46	87	7,827	0.300
S749	83.74	86	29,182	0.253
S75	43.89	90	3,823	0.277
S750	7.42	68	2,585	0.100
S751	122.57	81	42,714	0.183
S753	36.80	89	12,824	0.279
S754	39.45	88	13,746	0.100
S756	12.29	68	4,282	0.100
S757	70.10	80	24,429	0.221
S758	80.07	88	27,903	0.225
S759	20.89	72	7,280	0.131
S76	9.69	92	1,689	0.309

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S760	51.06	87	17,794	0.089
S761	128.54	89	44,795	0.132
S762	80.37	75	28,230	0.070
S763	62.76	67	21,870	0.310
S764	76.73	75	26,739	0.116
S765	125.52	89	43,741	0.105
S766	79.18	89	27,593	0.256
S767	186.78	89	65,090	0.142
S768	149.03	89	51,934	0.122
S769	82.53	63	28,760	0.141
S77	7.88	92	3,433	0.282
S770	143.59	89	50,038	0.525
S771	28.33	90	9,874	0.287
S772	36.57	88	12,744	0.374
S773	56.53	79	15,526	0.394
S774	33.01	90	11,502	0.350
S775	35.24	87	12,279	0.101
S776	39.46	88	13,752	0.101
S777	39.57	88	13,789	0.196
S778	39.64	88	13,813	0.101
S779	13.39	68	4,665	0.225
S78	12.44	92	5,419	0.211
S780	30.38	68	10,588	0.378
S781	5.52	68	1,922	0.100
S782	99.16	84	34,556	0.195
S783	40.59	89	14,143	0.100
S784	173.53	87	64,591	0.422
S785	52.53	87	18,304	0.253
S786	60.51	84	21,086	0.180
S787	33.05	63	11,517	0.776
S788	149.59	45	52,129	0.643
S788W	132.98	31	46,341	0.643
S789	123.99	80	43,208	0.380
S79	36.48	89	3,178	0.207
S790	106.21	86	37,012	0.218
S791	44.68	82	15,570	0.127
S791B	50.63	86	17,644	0.127
S792	80.59	83	28,084	0.135
S793	22.55	83	7,858	0.380
S794	117.78	87	41,044	0.096
S795	69.62	86	24,259	0.399

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S796	167.13	86	58,240	0.186
S797	80.54	81	28,066	0.122
S798	81.45	85	28,385	0.113
S799	43.37	87	15,113	0.222
S8	72.33	88	21,881	0.211
S80	22.39	91	9,755	0.589
S800	20.78	53	7,241	0.249
S801	30.74	78	10,710	0.935
S802	107.96	76	37,623	0.311
S803	6.68	90	2,327	0.544
S804	5.44	43	1,896	0.100
S805	5.55	90	1,932	0.100
S806	5.45	86	1,898	0.168
S807	12.95	85	4,513	0.100
S808	6.74	89	2,349	0.100
S809	1.31	92	456	0.100
S81	5.80	92	2,528	0.304
S810	3.75	92	1,307	0.181
S811	7.50	74	2,615	0.448
S812	65.77	68	24,619	0.244
S813	80.24	88	27,964	0.151
S814	6.39	91	2,226	0.154
S815	5.56	88	1,938	0.100
S816	5.44	89	1,896	0.100
S817	5.68	45	1,978	0.100
S818	5.73	90	1,998	0.100
S819	6.59	92	2,297	0.422
S82	3.71	92	1,615	0.281
S820	58.88	87	20,519	0.016
S821	13.01	82	4,534	0.416
S822	19.05	83	6,639	0.285
S823	85.84	86	29,914	0.221
S824	9.67	51	3,368	0.576
S826	44.60	80	15,541	0.217
S827	48.45	78	16,884	0.292
S827W	21.07	88	7,342	0.292
S828	36.85	88	12,843	0.251
S829	5.64	68	1,965	0.224
S83	13.93	89	6,069	0.510
S830	23.03	89	8,019	0.203
S831	40.77	88	14,208	0.311

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S831B	39.43	88	13,741	0.311
S832	5.05	92	1,760	0.147
S833E	26.55	91	9,414	0.207
S833W	36.91	88	12,862	0.207
S834	74.79	84	26,064	0.278
S835	36.73	84	12,798	0.386
S836	6.11	78	2,131	0.553
S837	0.55	81	192	0.349
S838	18.50	80	6,447	0.387
S839	2.91	88	1,014	0.010
S84	4.57	89	1,990	0.326
S840	1.63	73	567	0.626
S841	2.66	88	928	0.010
S842	11.69	88	4,072	0.445
S843	6.36	82	2,217	0.010
S844	7.40	86	2,578	0.883
S845	13.54	88	4,718	0.477
S846	8.45	84	2,945	0.453
S847	15.10	81	5,261	0.198
S848	3.18	81	1,108	0.217
S849	23.77	85	8,282	0.343
S85	80.61	88	28,091	0.285
S850	12.20	81	4,250	0.176
S851	10.18	83	3,547	0.505
S852	2.42	81	844	0.572
S853	0.92	73	321	0.307
S854	4.06	80	1,415	0.300
S855	1.17	72	406	0.300
S856	2.16	79	752	0.300
S857	1.99	88	694	0.300
S858	1.03	64	2,726	0.446
S86	24.46	88	8,523	0.020
S87	38.60	88	13,451	0.760
S88	4.74	79	4,132	2.209
S89	15.11	92	1,317	0.398
S9	79.08	87	20,876	0.238
S90	15.14	92	6,595	0.362
S91	20.93	87	7,294	0.220
S92	22.06	86	7,688	0.254
S93	24.13	84	8,408	0.321
S94	18.53	85	6,456	0.137

Table D-1. Future Conditions Hydrologic Parameters

Subcatchment Name	Area (ac)	Curve Number	Width (ft)	Slope (%)
S95	7.24	85	2,523	0.302
S96	3.92	87	727	0.109
S97	45.23	85	15,763	0.325
S98	58.99	85	20,557	0.164
S99	13.98	89	4,871	0.260
S794W	43.00	85	14,985	0.096
EAutoPlaza	126.00	68	43,908	0.210
S755_1	39.13	88	13,957	0.210
S755_2	41.00	88	13,957	0.210
S752_1	40.03	78	14,379	0.151
S752_2	42.49	78	14,379	0.151
S725	71.73	88	25,000	0.170
S825	101.51	87	35,375	0.115
S721	81.21	81	28,300	0.293
S720	100.63	83	35,067	0.179
Slvanhoe152_1	6.58	88	2,293	0.500
Slvanhoe152_2	20.34	57.31	1,772	0.500
Slvanhoe152_3	11.66	83.98	4,063	0.500
Slvanhoe152_4	34.36	80.12	11,974	0.500
Slvanhoe152_5	44.01	52.25	15,337	0.500

APPENDIX E

EXISTING CONDITIONS – MODEL JUNCTIONS AND DIVIDERS, CONDUITS, STORAGE AREAS, PUMPS, AND OUTFALLS

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
DIV-10	JUNCTION	318.90	5.1	100
DIV-14	JUNCTION	329.00	1.8	1,204,842
DIV-16	JUNCTION	326.93	2.0	100
DIV-34	JUNCTION	317.00	11.7	470,315
DIV-36	JUNCTION	322.00	8.0	848,400
DIV-42	JUNCTION	329.69	6.3	100
DIV-50	JUNCTION	328.80	5.2	100
DIV-54	JUNCTION	299.09	6.0	204,156
DIV-60	JUNCTION	299.09	6.0	204,156
DIV-64	JUNCTION	317.27	8.7	-
DIV-66	JUNCTION	302.90	4.7	100
JCT-100	JUNCTION	301.50	18.5	109,125
JCT-1000	JUNCTION	311.86	6.1	460,418
JCT-1002	JUNCTION	315.93	6.1	3,374,686
JCT-1004	JUNCTION	314.72	3.3	238,452
JCT-1006	JUNCTION	315.55	3.5	83,447
JCT-1008	JUNCTION	315.71	4.3	435,687
JCT-1010	JUNCTION	310.30	5.0	98,854
JCT-1012	JUNCTION	306.25	10.8	188,535
JCT-1014	JUNCTION	307.54	8.5	95,000
JCT-1016	JUNCTION	304.48	11.5	73,412
JCT-1018	JUNCTION	308.48	10.2	146,012
JCT-102	JUNCTION	302.74	17.3	207,106
JCT-1020	JUNCTION	310.00	10.0	872,792
JCT-1022	JUNCTION	313.70	6.3	72,273
JCT-1024	JUNCTION	314.01	8.0	71,989
JCT-1026	JUNCTION	314.30	7.7	64,792
JCT-1028	JUNCTION	314.55	7.5	184,609
JCT-1030	JUNCTION	315.03	7.0	119,390
JCT-1032	JUNCTION	315.42	6.6	37,886
JCT-1034	JUNCTION	315.69	6.3	260,880
JCT-1036	JUNCTION	316.02	6.0	93,027
JCT-1038	JUNCTION	316.86	5.1	2,067,412
JCT-104	JUNCTION	302.94	15.1	66,174
JCT-1040	JUNCTION	312.89	9.1	410,055
JCT-1044	JUNCTION	314.05	8.0	73,728
JCT-1046	JUNCTION	314.47	8.5	58,868
JCT-1048	JUNCTION	314.72	9.3	85,959
JCT-1050	JUNCTION	315.35	8.7	27,826

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1052	JUNCTION	307.28	12.4	406,982
JCT-1054	JUNCTION	306.68	12.6	352,358
JCT-1056	JUNCTION	306.58	12.7	127,333
JCT-1058	JUNCTION	317.61	6.4	479,027
JCT-106	JUNCTION	304.53	13.5	878,708
JCT-1060	JUNCTION	316.42	7.6	81,922
JCT-1062	JUNCTION	303.43	6.5	100
JCT-1064	JUNCTION	298.43	10.3	164,358
JCT-1066	JUNCTION	298.86	9.8	624,482
JCT-1068	JUNCTION	299.30	9.4	203,171
JCT-1070	JUNCTION	299.77	9.2	528,184
JCT-1072	JUNCTION	300.64	7.6	1,014,352
JCT-1076	JUNCTION	302.04	8.2	422,527
JCT-1078	JUNCTION	302.50	9.5	93,174
JCT-108	JUNCTION	306.00	14.0	69,635
JCT-1080	JUNCTION	304.30	8.7	1,197,826
JCT-1082	JUNCTION	303.15	8.5	100
JCT-1084	JUNCTION	303.50	7.2	68,506
JCT-1086	JUNCTION	304.53	7.5	52,579
JCT-1088	JUNCTION	305.18	6.8	164,540
JCT-1090	JUNCTION	304.35	9.0	602,170
JCT-1092	JUNCTION	304.67	9.4	100
JCT-1094	JUNCTION	305.54	7.2	129,870
JCT-1096	JUNCTION	305.67	7.8	164,346
JCT-1098	JUNCTION	306.00	8.5	813,097
JCT-110	JUNCTION	307.00	13.0	687,289
JCT-1100	JUNCTION	306.99	9.0	505,634
JCT-1102	JUNCTION	307.50	8.5	292,317
JCT-1104	JUNCTION	307.26	13.7	100
JCT-1106	JUNCTION	307.57	12.4	537,510
JCT-1108	JUNCTION	308.12	11.9	100
JCT-1110	JUNCTION	309.99	10.0	222,428
JCT-1112	JUNCTION	311.36	6.6	273,357
JCT-1114	JUNCTION	308.96	13.0	450,003
JCT-1116	JUNCTION	308.91	13.1	39,364
JCT-1118	JUNCTION	309.87	12.1	100
JCT-1120	JUNCTION	309.75	12.3	287,818
JCT-1122	JUNCTION	310.35	11.7	14,182
JCT-1124	JUNCTION	311.46	12.5	14,568

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1126	JUNCTION	305.19	14.8	100
JCT-1128	JUNCTION	306.55	13.5	561,737
JCT-1130	JUNCTION	309.53	10.5	250,005
JCT-1132	JUNCTION	309.02	11.0	72,386
JCT-1134	JUNCTION	308.09	7.9	100
JCT-1138	JUNCTION	308.93	6.1	100
JCT-1140	JUNCTION	309.11	4.9	100
JCT-1142	JUNCTION	309.88	4.1	100
JCT-1144	JUNCTION	310.68	3.3	100
JCT-1146	JUNCTION	310.34	3.7	100
JCT-1150	JUNCTION	310.90	3.1	291,227
JCT-1154	JUNCTION	317.49	8.5	594,933
JCT-1156	JUNCTION	313.90	12.1	100
JCT-1158	JUNCTION	312.60	13.4	100
JCT-116	JUNCTION	302.50	7.5	478,422
JCT-1160	JUNCTION	313.20	12.8	128,078
JCT-1162	JUNCTION	314.41	11.6	504,903
JCT-1170	JUNCTION	318.12	9.9	100
JCT-1172	JUNCTION	320.78	7.2	145,324
JCT-1174	JUNCTION	323.90	4.1	448,814
JCT-1176	JUNCTION	324.62	3.4	378,883
JCT-1178	JUNCTION	319.52	10.5	100
JCT-118	JUNCTION	301.00	5.0	443,666
JCT-1180	JUNCTION	318.85	11.2	100
JCT-1182	JUNCTION	317.86	12.1	858,062
JCT-1184	JUNCTION	318.54	11.5	217,272
JCT-1186	JUNCTION	319.34	12.7	119,051
JCT-1188	JUNCTION	319.52	14.5	100
JCT-1190	JUNCTION	320.50	13.5	184,121
JCT-1192	JUNCTION	325.52	8.5	82,010
JCT-1194	JUNCTION	321.10	8.9	117,187
JCT-1196	JUNCTION	322.04	10.0	204,938
JCT-1198	JUNCTION	324.50	9.5	225,098
JCT-120	JUNCTION	297.78	8.2	469,254
JCT-1200	JUNCTION	323.90	6.1	571,064
JCT-1202	JUNCTION	324.50	5.5	144,832
JCT-1204	JUNCTION	325.95	4.1	261,817
JCT-1206	JUNCTION	326.70	3.3	968,733
JCT-1208	JUNCTION	303.37	8.6	100

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1210	JUNCTION	304.64	7.4	57,941
JCT-1214	JUNCTION	303.47	8.5	30,922
JCT-1236	JUNCTION	304.12	9.9	100
JCT-1238	JUNCTION	306.50	7.5	35,457
JCT-1240	JUNCTION	307.70	8.3	96,276
JCT-1242	JUNCTION	308.60	7.4	45,564
JCT-1244	JUNCTION	308.15	5.9	332,438
JCT-1246	JUNCTION	304.28	9.7	228,270
JCT-1248	JUNCTION	305.42	6.6	425,851
JCT-1250	JUNCTION	306.16	7.8	243,718
JCT-1252	JUNCTION	306.76	6.2	1,380,786
JCT-1254	JUNCTION	334.80	3.2	100
JCT-1256	JUNCTION	336.10	4.0	100
JCT-1258	JUNCTION	332.22	2.8	100
JCT-1260	JUNCTION	327.40	10.6	161,402
JCT-1262	JUNCTION	325.45	12.6	100
JCT-1266	JUNCTION	326.83	13.2	642,577
JCT-1268	JUNCTION	327.98	10.0	175,230
JCT-1270	JUNCTION	313.20	12.8	100
JCT-1274	JUNCTION	313.12	8.9	176,384
JCT-1278	JUNCTION	296.95	15.1	100
JCT-1280	JUNCTION	299.51	10.5	100
JCT-1282	JUNCTION	296.50	15.5	100
JCT-1284	JUNCTION	298.75	15.3	100
JCT-1286	JUNCTION	299.60	14.4	100
JCT-1288	JUNCTION	297.42	14.6	100
JCT-1290	JUNCTION	297.95	14.1	100
JCT-1292	JUNCTION	299.60	14.4	100
JCT-1296	JUNCTION	301.85	12.2	100
JCT-1298	JUNCTION	300.72	13.3	100
JCT-1302	JUNCTION	299.16	8.8	446,500
JCT-1304	JUNCTION	301.77	8.2	100
JCT-1306	JUNCTION	307.41	6.6	80,656
JCT-1308	JUNCTION	307.61	8.4	100
JCT-1310	JUNCTION	308.37	9.6	100
JCT-1312	JUNCTION	309.11	8.9	349,823
JCT-1314	JUNCTION	310.12	7.9	362,346
JCT-1316	JUNCTION	310.71	7.3	11,566
JCT-1318	JUNCTION	312.12	7.9	567,062

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1320	JUNCTION	314.74	7.3	423,454
JCT-1322	JUNCTION	315.46	8.5	611,112
JCT-1324	JUNCTION	316.77	9.2	2,305,153
JCT-1326	JUNCTION	307.32	8.7	100
JCT-1328	JUNCTION	308.26	9.7	100
JCT-1330	JUNCTION	309.80	10.2	100
JCT-1332	JUNCTION	310.70	7.3	100
JCT-1334	JUNCTION	309.91	2.5	100
JCT-134	JUNCTION	289.07	14.9	164,241
JCT-1340	JUNCTION	309.14	10.9	100
JCT-1342	JUNCTION	308.24	10.3	298,605
JCT-1346	JUNCTION	299.83	4.2	299,109
JCT-1348	JUNCTION	301.33	2.7	188,229
JCT-1350	JUNCTION	301.62	8.4	100
JCT-136	JUNCTION	289.39	14.6	46,980
JCT-138	JUNCTION	290.12	11.9	221,251
JCT-1380	JUNCTION	306.00	4.0	298,039
JCT-1382	JUNCTION	288.38	5.6	100
JCT-1384	JUNCTION	287.33	6.7	100
JCT-1386	JUNCTION	280.79	13.2	100
JCT-1388	JUNCTION	288.60	15.4	100
JCT-1392	JUNCTION	300.07	10.1	100
JCT-1394	JUNCTION	300.00	12.0	100
JCT-1398	JUNCTION	302.26	3.9	100
JCT-140	JUNCTION	291.99	14.0	100
JCT-1400	JUNCTION	301.63	6.4	352,320
JCT-1402	JUNCTION	299.75	8.3	129,133
JCT-1404	JUNCTION	316.80	13.2	492,502
JCT-1406	JUNCTION	317.72	8.3	252,780
JCT-142	JUNCTION	292.60	11.4	146,778
JCT-144	JUNCTION	294.21	7.8	117,210
JCT-146	JUNCTION	295.20	6.8	127,229
JCT-148	JUNCTION	291.00	13.0	381,186
JCT-152	JUNCTION	297.72	12.3	437,690
JCT-154	JUNCTION	297.06	12.9	503,255
JCT-156	JUNCTION	296.26	12.0	143,268
JCT-158	JUNCTION	293.42	10.6	247,895
JCT-160	JUNCTION	291.76	12.2	100
JCT-162	JUNCTION	291.36	12.6	230,764

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-164	JUNCTION	289.90	14.1	568,962
JCT-168	JUNCTION	276.00	6.0	100
JCT-170	JUNCTION	274.00	8.0	100
JCT-172	JUNCTION	269.61	12.4	887,796
JCT-174	JUNCTION	278.68	11.3	100
JCT-176	JUNCTION	280.34	11.7	328,941
JCT-178	JUNCTION	282.32	11.7	363,191
JCT-180	JUNCTION	282.08	11.9	413,871
JCT-182	JUNCTION	283.98	16.0	783,993
JCT-196	JUNCTION	324.00	6.0	441,388
JCT-198	JUNCTION	330.70	11.6	280,619
JCT-200	JUNCTION	333.12	10.9	163,817
JCT-2001	JUNCTION	299.53	5.0	100
JCT-2002	JUNCTION	299.50	5.0	100
JCT-2003	JUNCTION	299.27	5.0	100
JCT-2004	JUNCTION	299.00	5.0	100
JCT-2005	JUNCTION	298.97	5.0	100
JCT-2010	JUNCTION	285.10	16.4	100
JCT-2011	JUNCTION	284.66	15.9	100
JCT-2012	JUNCTION	283.61	16.5	100
JCT-2014	JUNCTION	314.25	14.5	100
JCT-2015	JUNCTION	313.55	15.7	100
JCT-2016	JUNCTION	317.81	10.5	100
JCT-2017	JUNCTION	317.55	10.6	100
JCT-2018	JUNCTION	317.53	10.5	100
JCT-2019	JUNCTION	317.47	10.4	100
JCT-202	JUNCTION	332.29	9.7	272,118
JCT-2020	JUNCTION	323.87	15.9	100
JCT-2021	JUNCTION	323.47	17.5	100
JCT-2025	JUNCTION	286.38	14.2	100
JCT-2026	JUNCTION	285.83	14.7	100
JCT-2027	JUNCTION	285.63	15.2	100
JCT-2028	JUNCTION	285.42	15.7	100
JCT-2029	JUNCTION	305.68	11.3	100
JCT-2033	JUNCTION	315.93	16.5	355,661
JCT-2034	JUNCTION	315.49	16.9	100
JCT-2035	JUNCTION	315.00	16.7	816,145
JCT-2036	JUNCTION	314.16	17.1	190,819
JCT-2037	JUNCTION	308.78	8.0	65,553

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2038	JUNCTION	304.50	13.8	283,996
JCT-2041	JUNCTION	282.24	8.8	68,464
JCT-2042	JUNCTION	282.12	8.8	68,464
JCT-2043	JUNCTION	281.97	9.3	100
JCT-2044	JUNCTION	281.86	9.4	100
JCT-2045	JUNCTION	281.67	9.3	100
JCT-2046	JUNCTION	281.24	9.0	180,462
JCT-2047	JUNCTION	280.43	9.4	180,462
JCT-2048	JUNCTION	279.60	10.2	100
JCT-2049	JUNCTION	279.21	10.8	100
JCT-2050	JUNCTION	308.04	10.3	100
JCT-2051	JUNCTION	307.50	11.1	100
JCT-2052	JUNCTION	307.05	12.1	100
JCT-2053	JUNCTION	306.70	12.0	100
JCT-2054	JUNCTION	306.36	13.0	100
JCT-2055	JUNCTION	306.21	12.7	100
JCT-2056	JUNCTION	326.75	13.7	485,729
JCT-2057	JUNCTION	326.39	14.9	100
JCT-2058	JUNCTION	326.04	14.1	100
JCT-206	JUNCTION	325.25	14.8	100
JCT-2060	JUNCTION	324.90	15.9	100
JCT-2061	JUNCTION	325.17	15.3	100
JCT-2062	JUNCTION	340.64	9.9	100
JCT-2063	JUNCTION	339.99	12.2	100
JCT-2064	JUNCTION	339.62	12.8	100
JCT-2066	JUNCTION	308.88	8.5	100
JCT-2067	JUNCTION	308.80	8.0	36,416
JCT-2068	JUNCTION	308.16	9.1	100
JCT-2069	JUNCTION	308.00	9.3	257,660
JCT-2071	JUNCTION	309.03	8.0	1,026,484
JCT-2073	JUNCTION	306.10	7.2	354,750
JCT-2074	JUNCTION	305.10	8.3	130,324
JCT-2075	JUNCTION	303.70	10.7	274,191
JCT-2076	JUNCTION	301.44	14.2	100
JCT-2077	JUNCTION	300.07	10.3	611,329
JCT-2078	JUNCTION	298.14	12.6	430,255
JCT-2079	JUNCTION	295.88	14.3	559,432
JCT-208	JUNCTION	326.50	13.5	100
JCT-2081	JUNCTION	291.62	10.6	100

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2082	JUNCTION	291.28	10.7	100
JCT-2083	JUNCTION	289.73	12.1	100
JCT-2084	JUNCTION	289.22	14.0	100
JCT-2085	JUNCTION	295.17	13.4	100
JCT-2086	JUNCTION	296.25	13.1	100
JCT-2087	JUNCTION	296.17	10.8	100
JCT-2088	JUNCTION	281.15	4.9	283,092
JCT-2089	JUNCTION	280.58	6.0	100
JCT-2090	JUNCTION	279.99	7.0	100
JCT-2092	JUNCTION	276.19	2.5	7,554
JCT-2093	JUNCTION	275.32	11.2	100,000
JCT-2094	JUNCTION	273.65	11.9	106,152
JCT-2095	JUNCTION	274.93	11.9	100
JCT-2096	JUNCTION	305.29	11.3	100
JCT-2097	JUNCTION	333.84	9.7	67,614
JCT-2099	JUNCTION	341.49	9.1	100
JCT-210	JUNCTION	328.86	9.1	232,497
JCT-2100	JUNCTION	341.14	8.5	111,032
JCT-2101	JUNCTION	340.88	9.1	100
JCT-2102	JUNCTION	340.75	9.5	100
JCT-2103	JUNCTION	340.66	9.7	100
JCT-2104	JUNCTION	316.24	15.4	100
JCT-2105	JUNCTION	316.71	14.1	169,339
JCT-2106	JUNCTION	317.25	10.2	134,441
JCT-2108	JUNCTION	312.49	12.6	168,467
JCT-2109	JUNCTION	312.11	12.0	100
JCT-2110	JUNCTION	311.67	11.3	54,492
JCT-2111	JUNCTION	311.21	11.3	100
JCT-2112	JUNCTION	310.88	12.2	100
JCT-2113	JUNCTION	307.50	15.9	529,647
JCT-2114	JUNCTION	312.74	9.7	700,735
JCT-2115	JUNCTION	312.21	10.9	100
JCT-2116	JUNCTION	311.57	12.7	100
JCT-2117	JUNCTION	311.52	11.9	100
JCT-2118	JUNCTION	310.98	12.0	100
JCT-2119	JUNCTION	310.57	12.4	100
JCT-212	JUNCTION	330.24	7.8	85,254
JCT-2120	JUNCTION	310.34	12.4	284,244
JCT-2121	JUNCTION	309.74	12.4	100

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2122	JUNCTION	309.47	12.7	100
JCT-2123	JUNCTION	308.91	13.4	100
JCT-2124	JUNCTION	308.28	16.0	232,650
JCT-2125	JUNCTION	307.99	17.6	100
JCT-2126	JUNCTION	302.36	10.0	140,738
JCT-2127	JUNCTION	301.48	10.2	119,539
JCT-2128	JUNCTION	300.69	11.7	62,462
JCT-2129	JUNCTION	299.92	12.3	100
JCT-2130	JUNCTION	299.67	12.3	27,452
JCT-2131	JUNCTION	299.03	13.5	100
JCT-2132	JUNCTION	298.50	15.6	89,604
JCT-2134	JUNCTION	302.08	9.7	125,648
JCT-2135	JUNCTION	301.72	9.8	125,648
JCT-2136	JUNCTION	301.36	9.3	125,647
JCT-2137	JUNCTION	301.23	9.4	125,647
JCT-2138	JUNCTION	292.31	10.6	100
JCT-2139	JUNCTION	290.31	11.9	100
JCT-214	JUNCTION	326.51	13.5	100
JCT-2140	JUNCTION	287.29	15.9	100
JCT-2141	JUNCTION	297.02	7.6	380,656
JCT-2142	JUNCTION	296.47	7.7	20,788
JCT-2143	JUNCTION	296.29	7.5	100
JCT-2144	JUNCTION	295.79	7.4	100
JCT-2145	JUNCTION	294.91	8.1	100
JCT-2146	JUNCTION	293.51	8.7	324,475
JCT-2147	JUNCTION	294.84	7.2	641,152
JCT-2148	JUNCTION	294.53	7.5	45,635
JCT-2149	JUNCTION	294.20	9.0	100
JCT-2150	JUNCTION	293.88	9.9	121,995
JCT-2151	JUNCTION	293.57	9.3	110,182
JCT-2152	JUNCTION	293.14	8.5	95,467
JCT-2154	JUNCTION	303.75	7.3	301,088
JCT-2156	JUNCTION	309.52	8.1	755,909
JCT-2157	JUNCTION	304.67	11.0	100
JCT-2158	JUNCTION	303.82	11.4	100
JCT-2159	JUNCTION	303.67	11.7	100
JCT-216	JUNCTION	326.80	11.2	226,567
JCT-2160	JUNCTION	302.90	12.6	100
JCT-2161	JUNCTION	271.60	14.0	100

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2162	JUNCTION	284.86	15.7	100
JCT-2163	JUNCTION	317.03	14.4	100
JCT-2168	JUNCTION	329.18	5.8	100
JCT-2169	JUNCTION	283.13	17.1	100
JCT-2170	JUNCTION	282.90	18.6	100
JCT-2171	JUNCTION	282.81	18.1	100
JCT-2172	JUNCTION	282.46	19.0	100
JCT-2174	JUNCTION	320.57	10.9	258,591
JCT-2175	JUNCTION	320.18	12.9	675,015
JCT-2176	JUNCTION	319.86	14.0	100
JCT-2177	JUNCTION	319.59	12.6	100
JCT-2178	JUNCTION	319.55	14.7	100
JCT-2179	JUNCTION	319.29	12.5	100
JCT-218	JUNCTION	327.10	10.9	175,945
JCT-2180	JUNCTION	319.09	12.4	29,584
JCT-2181	JUNCTION	318.67	13.7	161,093
JCT-2182	JUNCTION	318.40	14.3	17,096
JCT-2183	JUNCTION	318.37	14.2	395,557
JCT-2184	JUNCTION	317.99	14.5	22,421
JCT-2185	JUNCTION	317.68	14.8	100
JCT-2186	JUNCTION	317.39	14.8	100
JCT-2189	JUNCTION	324.00	1.3	100
JCT-2190	JUNCTION	326.50	1.3	100
JCT-2191	JUNCTION	322.50	1.3	-
JCT-2192	JUNCTION	325.50	1.3	-
JCT-2193	JUNCTION	325.50	1.3	-
JCT-2194	JUNCTION	328.00	1.3	-
JCT-2195	JUNCTION	325.50	6.5	10
JCT-2196	JUNCTION	324.00	10.2	100
JCT-2198	JUNCTION	288.22	16.3	100
JCT-2199	JUNCTION	288.83	15.7	100
JCT-22	JUNCTION	318.77	10.1	947,383
JCT-220	JUNCTION	327.98	10.0	100
JCT-2200	JUNCTION	292.65	14.1	100
JCT-2201	JUNCTION	285.50	16.5	100
JCT-2202	JUNCTION	287.05	14.6	100
JCT-2203	JUNCTION	294.57	9.3	100
JCT-2204	JUNCTION	293.20	11.7	204,720
JCT-2205	JUNCTION	292.70	11.9	100

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2206	JUNCTION	291.73	13.5	100
JCT-2207	JUNCTION	296.22	10.0	100
JCT-2208	JUNCTION	292.92	12.3	100
JCT-2209	JUNCTION	293.04	11.8	65,270
JCT-2210	JUNCTION	296.98	7.8	24,647
JCT-2211	JUNCTION	288.60	10.4	600
JCT-2212	JUNCTION	329.00	4.6	100
JCT-2213	JUNCTION	328.00	5.7	100
JCT-2214	JUNCTION	323.61	10.0	100
JCT-2215	JUNCTION	323.46	9.3	100
JCT-2216	JUNCTION	332.18	7.1	100
JCT-2217	JUNCTION	323.00	16.9	100
JCT-2218	JUNCTION	298.24	5.0	100
JCT-2219	JUNCTION	308.95	9.1	100
JCT-222	JUNCTION	330.10	5.9	309,741
JCT-2221	JUNCTION	307.26	15.6	100
JCT-2222	JUNCTION	306.82	14.2	100
JCT-2223	JUNCTION	306.44	14.0	100
JCT-2224	JUNCTION	306.07	13.7	100
JCT-2225	JUNCTION	305.70	14.6	100
JCT-2226	JUNCTION	305.25	14.0	514,142
JCT-2227	JUNCTION	304.83	15.3	100
JCT-2228	JUNCTION	300.00	0.7	-
JCT-2229	JUNCTION	301.00	0.7	-
JCT-2230	JUNCTION	305.75	0.7	-
JCT-2231	JUNCTION	319.94	9.2	43,415
JCT-2233	JUNCTION	319.44	9.1	100
JCT-2234	JUNCTION	317.82	9.5	100
JCT-2235	JUNCTION	297.42	8.2	100
JCT-2236	JUNCTION	285.87	12.3	381,540
JCT-2237	JUNCTION	282.74	15.1	100
JCT-2239	JUNCTION	280.49	23.5	100
JCT-224	JUNCTION	328.80	7.2	309,741
JCT-2240	JUNCTION	306.25	5.0	100
JCT-2241	JUNCTION	342.36	7.6	129,839
JCT-2243	JUNCTION	345.00	0.5	100
JCT-2244	JUNCTION	344.97	0.5	100
JCT-2245	JUNCTION	344.53	0.5	-
JCT-2246	JUNCTION	344.50	0.5	-

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2247	JUNCTION	344.00	4.2	100
JCT-2248	JUNCTION	340.06	3.6	100
JCT-2251	JUNCTION	316.29	12.7	100
JCT-2252	JUNCTION	315.71	12.7	100
JCT-2254	JUNCTION	315.60	12.4	100
JCT-2255	JUNCTION	321.01	7.0	100
JCT-2256	JUNCTION	317.61	12.0	100
JCT-2257	JUNCTION	325.47	4.5	133,741
JCT-2258	JUNCTION	318.00	11.4	1,242,344
JCT-2259	JUNCTION	317.23	12.7	100
JCT-2261	JUNCTION	330.69	5.3	100
JCT-2262	JUNCTION	330.19	4.7	134,239
JCT-2263	JUNCTION	330.00	5.0	100
JCT-2264	JUNCTION	329.24	7.6	336,421
JCT-2265	JUNCTION	316.09	18.4	100
JCT-2267	JUNCTION	328.92	6.2	74,905
JCT-2268	JUNCTION	327.30	6.4	149,543
JCT-2269	JUNCTION	326.82	7.2	100
JCT-2270	JUNCTION	326.24	7.8	130,531
JCT-2271	JUNCTION	325.26	7.9	100
JCT-2272	JUNCTION	329.44	5.6	254,493
JCT-2273	JUNCTION	328.46	7.1	96,594
JCT-2274	JUNCTION	333.70	4.0	100
JCT-2275	JUNCTION	276.63	13.3	100
JCT-2276	JUNCTION	277.98	11.2	100
JCT-2277	JUNCTION	279.37	9.8	501,432
JCT-228	JUNCTION	329.37	4.6	100
JCT-2280	JUNCTION	326.50	1.3	100
JCT-2281	JUNCTION	325.00	1.3	100
JCT-2282	JUNCTION	300.38	9.6	100
JCT-2283	JUNCTION	324.00	1.3	-
JCT-2284	JUNCTION	323.68	7.8	100
JCT-2285	JUNCTION	324.55	6.5	134,562
JCT-2286	JUNCTION	325.02	5.0	121,442
JCT-2287	JUNCTION	318.56	10.7	100
JCT-2288	JUNCTION	322.64	12.0	100
JCT-2289	JUNCTION	321.47	14.3	64,500
JCT-2290	JUNCTION	320.94	14.1	100
JCT-2291	JUNCTION	323.43	11.6	514,551

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2292	JUNCTION	322.90	15.1	100
JCT-2293	JUNCTION	319.93	15.1	42,485
JCT-2294	JUNCTION	319.28	15.7	103,946
JCT-2295	JUNCTION	288.40	14.6	100
JCT-2296	JUNCTION	290.90	4.1	100
JCT-2297	JUNCTION	290.90	4.1	100
JCT-2298	JUNCTION	304.25	10.0	78,038
JCT-232	JUNCTION	334.25	5.8	287,077
JCT-234	JUNCTION	334.77	5.2	115,949
JCT-236	JUNCTION	335.33	7.0	100
JCT-238	JUNCTION	336.33	5.7	86,627
JCT-24	JUNCTION	322.00	6.0	475,894
JCT-240	JUNCTION	334.91	13.1	100
JCT-242	JUNCTION	335.25	12.8	100
JCT-244	JUNCTION	335.58	12.4	867,751
JCT-248	JUNCTION	334.00	10.0	100
JCT-250	JUNCTION	337.00	9.0	100
JCT-254	JUNCTION	334.25	7.8	100
JCT-256	JUNCTION	336.65	7.4	383,870
JCT-258	JUNCTION	338.12	5.9	84,934
JCT-26	JUNCTION	320.80	8.0	310,025
JCT-260	JUNCTION	339.00	5.0	298,652
JCT-270	JUNCTION	339.25	4.8	152,630
JCT-272	JUNCTION	338.00	4.0	119,466
JCT-274	JUNCTION	337.25	4.8	71,163
JCT-276	JUNCTION	336.80	5.2	97,712
JCT-278	JUNCTION	335.63	6.4	491,944
JCT-280	JUNCTION	333.80	6.2	194,820
JCT-284	JUNCTION	327.98	10.0	216,422
JCT-286	JUNCTION	329.00	7.0	11,950
JCT-290	JUNCTION	326.48	10.5	100
JCT-298	JUNCTION	331.10	2.9	406,725
JCT-30	JUNCTION	317.40	11.4	137,145
JCT-302	JUNCTION	332.00	5.0	100
JCT-308	JUNCTION	324.38	10.6	51,797
JCT-310	JUNCTION	324.30	11.0	70,119
JCT-312	JUNCTION	324.18	11.6	82,876
JCT-314	JUNCTION	323.82	11.8	443,359
JCT-316	JUNCTION	322.77	12.0	457,765

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-34	JUNCTION	320.00	4.0	100
JCT-346	JUNCTION	299.00	5.5	393,952
JCT-348	JUNCTION	300.61	5.0	232,603
JCT-350	JUNCTION	299.84	6.8	66,482
JCT-352	JUNCTION	299.67	7.3	29,847
JCT-354	JUNCTION	300.09	6.8	49,912
JCT-356	JUNCTION	298.81	8.8	86,670
JCT-358	JUNCTION	299.72	7.2	429,080
JCT-36	JUNCTION	329.97	16.0	100
JCT-360	JUNCTION	298.24	10.3	674,564
JCT-362	JUNCTION	297.89	12.0	100
JCT-364	JUNCTION	299.31	10.5	306,720
JCT-366	JUNCTION	297.62	13.2	100
JCT-370	JUNCTION	300.46	7.5	100
JCT-372	JUNCTION	297.59	8.4	133,562
JCT-374	JUNCTION	296.99	11.0	100
JCT-38	JUNCTION	328.99	17.0	100
JCT-382	JUNCTION	303.06	8.3	1,057,760
JCT-384	JUNCTION	301.50	9.5	295,910
JCT-388	JUNCTION	301.25	9.8	100
JCT-390	JUNCTION	300.89	7.5	287,753
JCT-392	JUNCTION	300.60	8.8	100
JCT-394	JUNCTION	302.66	12.0	1,158,469
JCT-396	JUNCTION	300.44	11.0	124,529
JCT-398	JUNCTION	301.20	11.0	48,354
JCT-40	JUNCTION	330.61	15.4	100
JCT-400	JUNCTION	303.00	9.0	278,009
JCT-406	JUNCTION	314.77	6.2	205,124
JCT-408	JUNCTION	312.42	9.6	493,193
JCT-410	JUNCTION	316.05	5.0	2,861,721
JCT-42	JUNCTION	332.00	14.0	815,868
JCT-436	JUNCTION	290.83	8.2	925,371
JCT-438	JUNCTION	291.58	7.4	448,114
JCT-44	JUNCTION	333.21	12.8	321,638
JCT-442	JUNCTION	304.80	4.1	100
JCT-446	JUNCTION	300.85	7.2	100
JCT-448	JUNCTION	300.60	9.4	100
JCT-450	JUNCTION	300.60	9.4	100
JCT-454	JUNCTION	300.17	11.3	100

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-456	JUNCTION	310.40	7.6	500,378
JCT-46	JUNCTION	335.21	9.8	368,733
JCT-460	JUNCTION	299.00	13.0	697,066
JCT-462	JUNCTION	298.19	13.8	100
JCT-464	JUNCTION	296.58	15.4	100
JCT-466	JUNCTION	297.30	16.7	100
JCT-468	JUNCTION	301.44	12.6	356,234
JCT-470	JUNCTION	299.13	14.9	240,183
JCT-472	JUNCTION	300.00	14.0	209,930
JCT-474	JUNCTION	300.44	13.6	282,146
JCT-476	JUNCTION	302.12	13.9	799,515
JCT-478	JUNCTION	320.95	7.5	100
JCT-48	JUNCTION	306.00	12.0	411,001
JCT-486	JUNCTION	318.85	5.2	100
JCT-490	JUNCTION	316.80	7.2	100
JCT-50	JUNCTION	304.26	13.7	100
JCT-516	JUNCTION	325.47	4.5	100
JCT-52	JUNCTION	298.60	19.4	53,103
JCT-54	JUNCTION	299.36	18.6	100
JCT-56	JUNCTION	299.77	18.2	714,283
JCT-58	JUNCTION	301.33	18.7	305,865
JCT-590	JUNCTION	308.00	14.0	10,000
JCT-594	JUNCTION	277.50	4.5	100
JCT-60	JUNCTION	305.63	10.0	161,563
JCT-618	JUNCTION	312.74	11.3	100
JCT-62	JUNCTION	302.76	12.0	225,765
JCT-620	JUNCTION	311.90	12.1	100
JCT-634	JUNCTION	322.19	13.0	100
JCT-64	JUNCTION	302.39	15.0	100
JCT-656	JUNCTION	327.82	11.5	563,291
JCT-658	JUNCTION	332.54	9.0	100
JCT-66	JUNCTION	298.40	19.5	100
JCT-662	JUNCTION	326.25	3.8	293,369
JCT-664	JUNCTION	326.31	3.7	100
JCT-666	JUNCTION	327.16	2.0	309,479
JCT-670	JUNCTION	321.06	7.3	10
JCT-676	JUNCTION	321.00	9.0	100
JCT-68	JUNCTION	298.90	19.0	100
JCT-682	JUNCTION	291.98	8.0	255,584

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-684	JUNCTION	291.71	8.3	276,912
JCT-686	JUNCTION	290.91	10.1	59,782
JCT-690	JUNCTION	295.97	6.0	205,427
JCT-692	JUNCTION	295.45	6.6	74,179
JCT-694	JUNCTION	294.52	7.0	71,880
JCT-696	JUNCTION	293.65	6.4	225,573
JCT-698	JUNCTION	293.29	6.7	74,348
JCT-70	JUNCTION	309.66	9.0	100
JCT-700	JUNCTION	293.12	6.9	100
JCT-702	JUNCTION	291.89	8.1	100
JCT-704	JUNCTION	293.87	6.1	455,828
JCT-706	JUNCTION	294.56	5.4	209,327
JCT-708	JUNCTION	295.51	4.5	147,367
JCT-710	JUNCTION	296.19	3.8	152,280
JCT-712	JUNCTION	296.64	3.4	36,323
JCT-718	JUNCTION	285.72	14.3	100
JCT-72	JUNCTION	310.13	8.0	353,687
JCT-720	JUNCTION	286.28	13.7	100
JCT-722	JUNCTION	287.42	12.6	445,590
JCT-724	JUNCTION	287.88	12.1	154,955
JCT-726	JUNCTION	289.50	10.5	154,955
JCT-728	JUNCTION	290.46	9.5	523,862
JCT-730	JUNCTION	292.13	15.5	43,868
JCT-738	JUNCTION	293.26	11.7	100
JCT-74	JUNCTION	306.00	12.0	121,538
JCT-740	JUNCTION	293.70	10.6	489,604
JCT-742	JUNCTION	294.18	10.3	66,321
JCT-750	JUNCTION	276.00	28.0	100
JCT-752	JUNCTION	289.36	16.4	100
JCT-76	JUNCTION	300.27	19.7	179,182
JCT-760	JUNCTION	280.50	25.5	100
JCT-762	JUNCTION	283.02	25.0	100
JCT-764	JUNCTION	284.79	21.2	197,173
JCT-766	JUNCTION	286.22	19.8	293,219
JCT-768	JUNCTION	287.25	16.8	131,082
JCT-770	JUNCTION	287.60	16.4	192,002
JCT-772	JUNCTION	284.22	23.8	100
JCT-776	JUNCTION	306.60	3.4	56,555
JCT-778	JUNCTION	299.50	6.5	130,105

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-78	JUNCTION	304.00	14.0	283,850
JCT-780	JUNCTION	300.20	5.8	468,945
JCT-782	JUNCTION	300.80	5.2	815,385
JCT-790	JUNCTION	327.11	16.9	302,349
JCT-792	JUNCTION	327.93	16.3	166,414
JCT-794	JUNCTION	329.53	14.5	388,097
JCT-796	JUNCTION	339.63	4.4	384,634
JCT-798	JUNCTION	329.97	14.0	210,617
JCT-80	JUNCTION	302.66	17.3	300,636
JCT-800	JUNCTION	331.84	10.2	311,666
JCT-802	JUNCTION	332.98	11.0	435,907
JCT-804	JUNCTION	333.59	9.4	45,320
JCT-806	JUNCTION	334.04	9.0	479,402
JCT-808	JUNCTION	330.69	13.3	180,744
JCT-810	JUNCTION	331.47	12.5	251,141
JCT-812	JUNCTION	332.11	11.9	1,213,071
JCT-814	JUNCTION	333.51	10.5	246,414
JCT-82	JUNCTION	304.14	15.9	1,009,148
JCT-820	JUNCTION	329.87	6.1	676,864
JCT-822	JUNCTION	337.96	3.6	603,939
JCT-824	JUNCTION	335.24	2.8	391,210
JCT-826	JUNCTION	336.28	2.0	271,964
JCT-828	JUNCTION	334.96	3.0	100
JCT-830	JUNCTION	331.40	6.6	472,065
JCT-832	JUNCTION	330.41	7.6	100
JCT-84	JUNCTION	312.00	12.0	100
JCT-846	JUNCTION	324.57	11.4	100
JCT-848	JUNCTION	324.88	9.1	212,602
JCT-850	JUNCTION	325.95	8.1	79,910
JCT-854	JUNCTION	327.75	6.3	28,574
JCT-856	JUNCTION	329.13	2.9	128,522
JCT-858	JUNCTION	328.30	5.7	303,923
JCT-860	JUNCTION	328.64	5.4	100
JCT-862	JUNCTION	327.58	7.4	259,090
JCT-864	JUNCTION	335.00	2.0	35,063
JCT-866	JUNCTION	331.00	3.0	218,691
JCT-868	JUNCTION	325.95	6.1	100,963
JCT-870	JUNCTION	324.24	9.8	606,166
JCT-874	JUNCTION	323.55	12.5	46,785

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-88	JUNCTION	312.32	16.2	323,978
JCT-880	JUNCTION	324.15	9.9	100
JCT-882	JUNCTION	324.00	6.0	100
JCT-884	JUNCTION	323.04	8.8	100
JCT-886	JUNCTION	323.30	8.9	100
JCT-888	JUNCTION	323.43	10.2	100
JCT-890	JUNCTION	328.67	5.5	161,094
JCT-894	JUNCTION	323.35	10.7	149,124
JCT-896	JUNCTION	323.70	10.3	181,295
JCT-898	JUNCTION	325.25	8.8	177,455
JCT-900	JUNCTION	326.80	7.2	199,152
JCT-902	JUNCTION	326.05	10.0	270,399
JCT-910	JUNCTION	290.90	4.1	100
JCT-912	JUNCTION	291.99	14.0	100
JCT-914	JUNCTION	291.84	13.3	100
JCT-916	JUNCTION	299.04	4.4	72,284
JCT-918	JUNCTION	291.71	10.0	194,056
JCT-920	JUNCTION	294.78	10.6	100
JCT-922	JUNCTION	295.59	9.1	100
JCT-924	JUNCTION	296.03	9.6	82,055
JCT-926	JUNCTION	297.27	8.0	29,477
JCT-928	JUNCTION	297.51	7.0	233,491
JCT-930	JUNCTION	288.40	6.6	100
JCT-932	JUNCTION	301.50	6.5	100
JCT-934	JUNCTION	302.40	5.6	824,229
JCT-936	JUNCTION	304.40	3.6	100
JCT-938	JUNCTION	302.45	2.5	100,732
JCT-940	JUNCTION	301.40	3.5	100
JCT-942	JUNCTION	298.69	5.2	507,409
JCT-944	JUNCTION	298.02	8.0	76,486
JCT-946	JUNCTION	293.54	12.5	340,049
JCT-948	JUNCTION	294.17	10.8	133,051
JCT-950	JUNCTION	295.98	8.0	82,025
JCT-952	JUNCTION	296.90	7.1	319,320
JCT-954	JUNCTION	297.80	6.2	573,373
JCT-956	JUNCTION	296.71	7.3	116,352
JCT-958	JUNCTION	295.42	10.6	41,567
JCT-96	JUNCTION	308.00	12.0	417,522
JCT-960	JUNCTION	296.33	9.7	934,728

Table E-1. Existing Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-964	JUNCTION	299.67	8.3	377,746
JCT-968	JUNCTION	303.32	5.5	234,401
JCT-970	JUNCTION	303.25	5.8	30,981
JCT-972	JUNCTION	301.25	5.4	100
JCT-974	JUNCTION	301.70	5.4	100
JCT-976	JUNCTION	282.93	21.1	100
JCT-978	JUNCTION	285.78	16.2	248,714
JCT-98	JUNCTION	306.98	13.0	337,009
JCT-980	JUNCTION	291.73	12.3	814,361
JCT-982	JUNCTION	287.40	14.6	148,189
JCT-984	JUNCTION	287.40	14.6	100
JCT-986	JUNCTION	288.30	13.7	449,907
JCT-988	JUNCTION	302.02	4.2	100
JCT-990	JUNCTION	302.66	11.3	101,180
JCT-992	JUNCTION	304.09	9.9	266,765
JCT-994	JUNCTION	306.72	11.3	210,059
JCT-996	JUNCTION	308.65	9.4	361,792
JCT-998	JUNCTION	310.00	8.0	337,892
JCT-BEECH	JUNCTION	309.00	10.0	100
JCT-E1	JUNCTION	303.50	5.7	1,267,765
JCT-MG	JUNCTION	320.87	5.2	882,221
JCT-MK	JUNCTION	286.00	6.0	150,081
JEG-02	JUNCTION	323.80	11.3	38,717
JEG-03	JUNCTION	322.00	11.9	100,745
JG-1	JUNCTION	315.00	9.0	1,021,200
JG-10	JUNCTION	313.73	12.3	536,975
JG-11	JUNCTION	307.89	12.6	583,342
JG-13	JUNCTION	299.82	12.7	1,912,668
JG-14	JUNCTION	295.47	14.5	744,627
JG-16	JUNCTION	302.50	7.5	88,145
JG-17	JUNCTION	299.09	9.1	175,693
JG-2	JUNCTION	310.15	13.9	547,959
JG-ShirkW	JUNCTION	281.75	18.1	100
JO-440	JUNCTION	287.00	13.0	100
JCT-GD1	JUNCTION	254.00	29.0	100
JCTN-27	JUNCTION	297.48	11.0	100.00
DIV-12	DIVIDER	316.76	1.0	-
DIV-52	DIVIDER	328.01	5.7	-

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
5	CIRCULAR	303.50	297.80	2,624	1.5
CCDT-BEECH	CIRCULAR	313.27	313.00	400	1
CDT-1001	CIRCULAR	286.28	285.72	274	3
CDT-1003	CIRCULAR	287.88	287.03	798	2.25
CDT-1005	CIRCULAR	289.50	288.13	806	2
CDT-1007	CIRCULAR	290.46	289.50	470	2
CDT-1009	CIRCULAR	280.50	278.50	119	3.5
CDT-1011	CIRCULAR	283.02	280.50	1,672	3.5
CDT-1015	CIRCULAR	286.22	284.79	945	2
CDT-1017	CIRCULAR	287.25	286.22	681	2
CDT-1019	CIRCULAR	287.60	287.25	203	2
CDT-1021	CIRCULAR	284.22	283.02	595	3.5
CDT-1023	CIRCULAR	297.05	284.72	133	3
CDT-1025	CIRCULAR	299.50	297.30	1,271	2.25
CDT-1029	CIRCULAR	300.80	300.20	917	2
CDT-1037	CIRCULAR	327.11	325.84	192	3.5
CDT-1039	CIRCULAR	329.97	328.11	597	2.5
CDT-1041	CIRCULAR	331.84	329.97	712	2.5
CDT-1043	CIRCULAR	333.59	332.34	611	2
CDT-1045	CIRCULAR	334.04	333.59	293	2
CDT-1047	CIRCULAR	332.98	332.34	427	2
CDT-1049	CIRCULAR	329.53	328.93	650	2
CDT-1051	CIRCULAR	339.63	328.93	470	2
CDT-1053	CIRCULAR	327.93	327.61	505	3
CDT-1057	CIRCULAR	331.47	330.69	382	3
CDT-1055	CIRCULAR	330.69	327.16	883	3
CDT-1013	CIRCULAR	284.79	284.52	174	2
CDT-1059	CIRCULAR	332.11	331.47	313	3
CDT-1061	CIRCULAR	333.51	333.11	198	2
CDT-1067	CIRCULAR	329.87	329.69	112	2
CDT-1069	CIRCULAR	329.69	328.00	128	2
CDT-1071	CIRCULAR	329.69	329.00	410	2
CDT-1073	CIRCULAR	337.96	335.49	833	2
CDT-1075	CIRCULAR	335.24	333.60	1,312	2.25
CDT-1077	CIRCULAR	336.28	335.21	656	2
CDT-1079	CIRCULAR	334.96	333.60	676	2.25
CDT-1081	CIRCULAR	331.40	330.41	891	2.5
CDT-1083	CIRCULAR	330.41	330.26	483	2.5
CDT-1085	CIRCULAR	327.58	327.00	194	3.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1087	CIRCULAR	327.75	327.58	616	3.5
CDT-1089	CIRCULAR	328.30	327.75	413	3.5
CDT-1091	CIRCULAR	328.64	328.30	223	3.5
CDT-1093	CIRCULAR	328.80	328.75	40	2.5
CDT-1095	CIRCULAR	329.13	328.80	781	2.5
CDT-1097	CIRCULAR	328.80	325.95	735	2.5
CDT-1099	CIRCULAR	325.95	324.88	703	2.5
CDT-1101	CIRCULAR	324.88	324.57	310	2.5
CDT-1107	CIRCULAR	335.00	331.00	1,982	2
CDT-1109	CIRCULAR	331.00	326.95	888	2
CDT-1111	CIRCULAR	325.95	324.24	1,416	3
CDT-1113	CIRCULAR	324.24	324.15	89	3
CDT-1117	CIRCULAR	325.07	324.65	408	2.5
CDT-1121	CIRCULAR	324.15	323.55	593	3
CDT-1129	CIRCULAR	324.00	320.03	260	2
CDT-1135	CIRCULAR	328.67	328.01	1,106	2
CDT-1137	CIRCULAR	328.01	328.00	10	2
CDT-1139	CIRCULAR	328.01	323.81	38	2
CDT-1141	CIRCULAR	323.43	323.61	170	2
CDT-1143	CIRCULAR	323.30	323.04	513	2
CDT-1145	CIRCULAR	323.04	323.00	38	2
CDT-1147	CIRCULAR	323.35	322.00	266	3
CDT-1149	CIRCULAR	323.70	323.35	392	3
CDT-1151	CIRCULAR	325.25	324.20	673	2.5
CDT-1153	CIRCULAR	326.80	325.75	698	2
CDT-1155	CIRCULAR	326.05	324.70	895	2
CDT-1157	CIRCULAR	294.18	293.80	103	2
CDT-1159	CIRCULAR	293.70	293.36	172	2.25
CDT-1167	CIRCULAR	289.36	288.83	533	4.5
CDT-1175	CIRCULAR	291.90	290.90	120	2.5
CDT-1183	CIRCULAR	294.78	291.71	621	3
CDT-1185	CIRCULAR	295.59	295.28	278	2.5
CDT-1187	CIRCULAR	296.03	295.59	556	2.5
CDT-1191	CIRCULAR	297.86	297.52	225	2
CDT-1193	CIRCULAR	291.90	288.50	210	1.5
CDT-1195	CIRCULAR	288.40	287.15	60	2.5
CDT-1199	CIRCULAR	292.13	286.80	99	2.5
CDT-1203	CIRCULAR	302.40	300.00	155	2
CDT-1205	CIRCULAR	302.45	302.40	693	2.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1207	CIRCULAR	301.40	300.09	1,436	3.5
CDT-1209	CIRCULAR	299.09	298.69	190	3.5
CDT-1211	CIRCULAR	298.69	298.02	807	3.5
CDT-1215	CIRCULAR	299.09	298.49	58	3.5
CDT-1217	CIRCULAR	293.54	290.36	2,032	3.5
CDT-1219	CIRCULAR	294.17	293.54	420	3.5
CDT-1221	CIRCULAR	295.98	295.17	528	2.5
CDT-1223	CIRCULAR	296.71	296.48	225	2
CDT-1225	CIRCULAR	296.90	295.98	606	2.5
CDT-1227	CIRCULAR	297.80	296.90	525	2.5
CDT-1229	CIRCULAR	295.42	295.17	800	2.5
CDT-1231	CIRCULAR	296.33	295.67	604	2.25
CDT-1233	CIRCULAR	306.60	302.77	1,286	2.5
CDT-1235	CIRCULAR	303.32	303.25	136	2.5
CDT-1237	CIRCULAR	303.25	302.77	735	2.5
CDT-1239	CIRCULAR	301.77	299.67	1,394	3.5
CDT-1245	CIRCULAR	299.67	299.16	1,282	3.5
CDT-1247	CIRCULAR	299.16	296.42	1,289	3.5
CDT-1257	CIRCULAR	288.30	287.40	587	2
CDT-1259	CIRCULAR	287.40	286.28	738	2
CDT-1261	CIRCULAR	287.40	286.28	737	2
CDT-1263	CIRCULAR	285.78	282.93	1,899	2.5
CDT-1265	CIRCULAR	291.73	283.43	594	2
CDT-1267	CIRCULAR	282.93	280.59	1,182	3
CDT-1275	CIRCULAR	302.66	301.00	433	4
CDT-1277	CIRCULAR	304.09	302.66	946	4
CDT-1279	CIRCULAR	306.25	304.09	1,436	4
CDT-1281	CIRCULAR	306.72	306.25	309	4
CDT-1283	CIRCULAR	308.65	306.72	871	4
CDT-1285	CIRCULAR	310.00	308.65	1,308	4
CDT-1287	CIRCULAR	311.86	310.00	1,239	4
CDT-1289	CIRCULAR	315.93	313.36	2,667	2.5
CDT-1291	CIRCULAR	314.72	313.86	571	2
CDT-1293	CIRCULAR	315.55	314.72	546	2
CDT-1295	CIRCULAR	315.71	315.55	106	2
CDT-1297	CIRCULAR	312.49	309.00	948	2
CDT-1299	CIRCULAR	309.54	308.25	854	2
CDT-1301	CIRCULAR	304.48	305.50	391	1.5
CDT-1303	CIRCULAR	308.48	307.98	451	3

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1305	CIRCULAR	310.00	308.48	933	3
CDT-1307	CIRCULAR	313.70	311.00	316	2
CDT-1309	CIRCULAR	312.89	311.00	796	2
CDT-1315	CIRCULAR	314.47	314.05	279	2
CDT-1317	CIRCULAR	314.72	314.47	167	2
CDT-1319	CIRCULAR	315.35	314.72	616	2
CDT-1321	CIRCULAR	317.61	316.42	795	2
CDT-1323	CIRCULAR	316.42	315.35	501	2
CDT-1325	CIRCULAR	314.01	313.70	304	2
CDT-1327	CIRCULAR	314.30	314.01	282	2
CDT-1329	CIRCULAR	314.55	314.30	248	2
CDT-1331	CIRCULAR	315.03	314.55	320	2
CDT-1333	CIRCULAR	315.42	315.03	252	2
CDT-1335	CIRCULAR	315.69	315.42	177	2
CDT-1337	CIRCULAR	316.02	315.69	219	2
CDT-1339	CIRCULAR	316.86	316.02	555	2
CDT-1343	CIRCULAR	298.43	297.54	595	2.5
CDT-1345	CIRCULAR	298.86	298.43	282	2.5
CDT-1347	CIRCULAR	299.30	298.86	296	2.5
CDT-1351	CIRCULAR	300.64	299.77	575	2.5
CDT-1353	CIRCULAR	302.04	300.89	600	2.25
CDT-1357	CIRCULAR	302.50	302.29	288	2
CDT-1359	CIRCULAR	304.30	302.50	331	2
CDT-1363	CIRCULAR	303.39	303.00	226	3
CDT-1365	CIRCULAR	304.17	303.39	514	3
CDT-1367	CIRCULAR	304.53	304.42	236	2.25
CDT-1369	CIRCULAR	305.18	304.78	426	2
CDT-1371	CIRCULAR	304.35	303.76	812	3
CDT-1373	CIRCULAR	304.67	304.35	150	2.5
CDT-1375	CIRCULAR	305.54	304.67	688	2.5
CDT-1377	CIRCULAR	305.67	305.54	282	2.5
CDT-1379	CIRCULAR	306.00	305.67	291	3
CDT-1381	CIRCULAR	306.99	306.00	1,159	2.5
CDT-1383	CIRCULAR	307.50	306.99	1,445	2
CDT-1389	CIRCULAR	305.19	299.09	237	2.5
CDT-1391	CIRCULAR	306.55	305.19	329	2.5
CDT-1393	CIRCULAR	309.53	307.05	1,650	2
CDT-1395	CIRCULAR	307.26	299.09	277	3.5
CDT-1397	CIRCULAR	308.96	307.76	1,327	3

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1399	CIRCULAR	309.75	309.46	185	2.5
CDT-1401	CIRCULAR	310.35	309.75	390	2.5
CDT-1403	CIRCULAR	311.46	310.85	408	2
CDT-1407	CIRCULAR	308.12	308.07	352	3
CDT-1405	CIRCULAR	307.57	307.26	193	3.5
CDT-1409	CIRCULAR	308.91	308.62	517	2.5
CDT-1411	CIRCULAR	309.87	309.41	301	2
CDT-1413	CIRCULAR	309.02	308.62	261	2.5
CDT-1415	CIRCULAR	309.99	309.02	636	2.5
CDT-1417	CIRCULAR	311.36	310.49	573	2
CDT-1419	CIRCULAR	308.59	308.09	327	2.5
CDT-1421	CIRCULAR	308.93	308.59	224	2.5
CDT-1423	CIRCULAR	309.11	308.93	119	2.5
CDT-1425	CIRCULAR	309.88	309.11	505	2.5
CDT-1427	CIRCULAR	310.68	310.38	197	2
CDT-1429	CIRCULAR	310.90	310.34	299	2
CDT-1431	CIRCULAR	309.59	308.00	59	1
CDT-1435	CIRCULAR	310.34	310.00	157	2
CDT-1437	CIRCULAR	310.09	308.00	68	1
CDT-1439	CIRCULAR	312.60	302.00	253	2.5
CDT-1441	CIRCULAR	313.20	312.60	288	2.5
CDT-1443	CIRCULAR	313.90	313.20	496	2.5
CDT-1445	CIRCULAR	314.41	313.90	298	2.5
CDT-1453	CIRCULAR	318.12	318.00	194	2.5
CDT-1455	CIRCULAR	319.52	318.12	695	3.5
CDT-1457	CIRCULAR	318.85	318.62	547	2
CDT-1459	CIRCULAR	320.78	318.12	1,325	2.5
CDT-1461	CIRCULAR	323.90	321.28	1,076	2
CDT-1463	CIRCULAR	324.62	323.90	324	2
CDT-1465	CIRCULAR	317.86	313.51	482	3.5
CDT-1467	CIRCULAR	318.54	318.36	195	3
CDT-1469	CIRCULAR	319.34	318.54	971	3
CDT-1471	CIRCULAR	319.52	319.34	254	3
CDT-1473	CIRCULAR	320.50	319.52	276	3
CDT-1475	CIRCULAR	321.10	320.02	499	2.5
CDT-1477	CIRCULAR	322.04	321.10	416	2.5
CDT-1479	CIRCULAR	324.50	322.54	1,158	2
CDT-1481	CIRCULAR	325.52	321.50	784	2
CDT-1483	CIRCULAR	323.90	322.25	1,006	2

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1485	CIRCULAR	324.50	323.90	380	2
CDT-1487	CIRCULAR	325.95	324.50	469	2
CDT-1489	CIRCULAR	326.70	325.95	469	2
CDT-1491	CIRCULAR	303.37	300.00	278	3
CDT-1493	CIRCULAR	304.64	304.37	176	2
CDT-1495	CIRCULAR	305.79	304.64	451	2
CDT-1497	CIRCULAR	303.47	303.37	60	3
CDT-1499	CIRCULAR	304.12	303.47	421	3
CDT-1501	CIRCULAR	305.42	305.28	1,137	2
CDT-1503	CIRCULAR	306.16	305.42	476	2
CDT-1505	CIRCULAR	306.76	306.16	389	2
CDT-1507	CIRCULAR	306.50	305.12	913	2
CDT-1509	CIRCULAR	307.70	306.50	778	2
CDT-1511	CIRCULAR	308.60	307.70	598	2
CDT-1513	CIRCULAR	308.15	306.50	1,091	2
CDT-1517	CIRCULAR	325.95	325.17	350	2.5
CDT-1519	CIRCULAR	327.90	325.45	1,258	2
CDT-1521	CIRCULAR	326.83	325.45	247	2.5
CDT-1523	CIRCULAR	328.48	326.83	551	2
CDT-1525	CIRCULAR	334.80	333.00	851	2.25
CDT-1527	CIRCULAR	336.35	334.80	636	2
CDT-1529	CIRCULAR	332.22	331.00	604	2
CDT-1533	CIRCULAR	313.55	313.70	244	4
CDT-1535	CIRCULAR	313.20	302.00	391	4.5
CDT-1545	CIRCULAR	313.12	312.89	142	2
CDT-1547	CIRCULAR	314.05	313.12	615	2
CDT-1551	CIRCULAR	296.50	292.00	329	3.5
CDT-1553	CIRCULAR	296.95	296.50	285	3.5
CDT-1555	CIRCULAR	299.51	298.45	703	2
CDT-1557	CIRCULAR	298.75	296.95	1,198	3.5
CDT-1559	CIRCULAR	299.60	299.25	564	2.5
CDT-1561	CIRCULAR	297.42	292.00	701	4.5
CDT-1563	CIRCULAR	297.95	297.42	345	4.5
CDT-1565	CIRCULAR	299.60	298.45	1,055	3.5
CDT-1567	CIRCULAR	302.90	299.60	759	3.5
CDT-1569	CIRCULAR	301.85	301.60	462	2
CDT-1571	CIRCULAR	300.72	300.25	307	2
CDT-1573	CIRCULAR	300.20	299.75	1,053	2
CDT-1575	CIRCULAR	307.41	307.00	271	3.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1577	CIRCULAR	307.86	307.41	201	3.5
CDT-1579	CIRCULAR	309.87	307.61	752	4
CDT-1581	CIRCULAR	310.11	309.87	239	3.5
CDT-1583	CIRCULAR	310.12	309.11	1,004	3.5
CDT-1585	CIRCULAR	310.71	310.62	90	3
CDT-1587	CIRCULAR	312.12	311.21	1,153	2.5
CDT-1589	CIRCULAR	314.74	312.62	1,866	2
CDT-1591	CIRCULAR	315.46	314.74	716	2
CDT-1593	CIRCULAR	316.77	315.46	1,302	2
CDT-1595	CIRCULAR	307.82	307.00	208	2.5
CDT-1597	CIRCULAR	308.26	307.32	939	3
CDT-1601	CIRCULAR	310.70	310.30	388	2
CDT-1603	CIRCULAR	309.91	309.80	109	2.5
CDT-1605	CIRCULAR	309.14	308.26	871	3
CDT-1607	CIRCULAR	309.80	309.64	151	2.5
CDT-1613	CIRCULAR	304.28	304.12	100	3
CDT-1621	CIRCULAR	299.83	299.69	2,712	2.5
CDT-1623	CIRCULAR	301.33	299.83	975	2.5
CDT-1649	CIRCULAR	301.62	300.60	508	2
CDT-1651	CIRCULAR	298.02	297.59	427	3.5
CDT-1657	CIRCULAR	306.00	303.00	1,369	2
CDT-1659	CIRCULAR	280.79	280.00	2,844	2.5
CDT-1661	CIRCULAR	288.38	287.33	1,316	2
CDT-1663	CIRCULAR	287.33	280.00	578	2
CDT-1665	CIRCULAR	300.00	300.07	178	2
CDT-1667	CIRCULAR	300.17	300.07	46	2.5
CDT-1669	CIRCULAR	304.40	302.40	132	3.5
CDT-1671	CIRCULAR	299.77	299.30	313	2.5
CDT-1675	CIRCULAR	280.49	280.25	339	3
CDT-1677	CIRCULAR	301.63	300.25	904	2
CDT-1679	CIRCULAR	299.75	299.66	683	3
CDT-1681	CIRCULAR	310.40	309.80	354	2
CDT-1683	CIRCULAR	316.80	304.67	549	3
CDT-1685	CIRCULAR	317.49	317.27	223	2
CDT-1687	CIRCULAR	317.27	317.05	210	2
CDT-1689	CIRCULAR	317.27	316.97	305	2
CDT-1691	CIRCULAR	317.72	316.97	743	2
CDT-1695	CIRCULAR	304.85	304.80	10	1.75
CDT-1697	CIRCULAR	304.85	301.05	2,637	1.75

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-195	CIRCULAR	335.58	334.91	237	2
CDT-197	CIRCULAR	335.25	334.91	123	2
CDT-199	CIRCULAR	334.91	324.72	151	2
CDT-2001	CIRCULAR	299.53	299.50	66	5
CDT-2002	CIRCULAR	299.50	299.27	442	5
CDT-2003	CIRCULAR	299.27	299.00	450	5
CDT-2004	CIRCULAR	299.00	298.97	31	5
CDT-2008	CIRCULAR	285.10	284.66	317	4
CDT-2009	CIRCULAR	284.66	283.61	96	4
CDT-2010	CIRCULAR	310.00	314.25	328	4
CDT-2011	CIRCULAR	314.25	313.55	329	4
CDT-2012	CIRCULAR	317.81	317.55	296	4
CDT-2013	CIRCULAR	317.55	317.53	304	4
CDT-2014	CIRCULAR	317.53	317.47	270	4
CDT-2015	CIRCULAR	317.47	313.55	182	4
CDT-2016	CIRCULAR	323.87	323.47	495	4
CDT-2017	CIRCULAR	323.47	323.42	72	4
CDT-2020	CIRCULAR	286.38	285.83	369	3.5
CDT-2021	CIRCULAR	285.83	285.63	135	3.5
CDT-2022	CIRCULAR	285.63	285.42	139	3.5
CDT-2023	CIRCULAR	285.42	285.10	139	3.5
CDT-2024	CIRCULAR	305.68	305.29	189	2.5
CDT-2025	CIRCULAR	305.29	304.67	310	2.5
CDT-2026	CIRCULAR	304.67	303.82	430	3
CDT-2027	CIRCULAR	303.82	303.67	74	3.5
CDT-2028	CIRCULAR	303.67	302.90	389	3.5
CDT-2029	CIRCULAR	315.93	315.49	471	3.5
CDT-2030	CIRCULAR	315.49	315.00	384	3.5
CDT-2031	CIRCULAR	315.00	314.16	168	3.5
CDT-2032	CIRCULAR	308.78	308.40	501	3.5
CDT-2035	CIRCULAR	282.24	282.12	113	3
CDT-2036	CIRCULAR	282.12	281.97	150	3
CDT-2037	CIRCULAR	281.97	281.86	108	3
CDT-2038	CIRCULAR	281.86	281.67	91	3
CDT-2039	CIRCULAR	281.67	281.24	326	3
CDT-2040	CIRCULAR	281.24	280.43	272	3
CDT-2041	CIRCULAR	280.43	279.60	268	3
CDT-2042	CIRCULAR	279.60	279.21	139	3
CDT-2043	CIRCULAR	308.04	307.50	336	2.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2044	CIRCULAR	307.50	307.05	279	3
CDT-2045	CIRCULAR	307.05	306.70	222	3
CDT-2046	CIRCULAR	306.70	306.36	208	3
CDT-2047	CIRCULAR	306.36	306.21	93	3
CDT-2049	CIRCULAR	326.75	326.39	263	3
CDT-2050	CIRCULAR	326.39	326.04	248	3
CDT-2051	CIRCULAR	326.04	323.87	165	3
CDT-2052	CIRCULAR	324.90	323.87	20	3
CDT-2053	CIRCULAR	325.17	324.90	344	3
CDT-2054	CIRCULAR	340.64	339.99	476	3
CDT-2055	CIRCULAR	339.99	339.62	333	3
CDT-2056	CIRCULAR	339.62	331.00	163	3
CDT-2058	CIRCULAR	308.88	308.80	194	3
CDT-2059	CIRCULAR	308.80	308.16	358	3
CDT-2060	CIRCULAR	308.16	308.00	123	3
CDT-2061	CIRCULAR	308.00	298.60	188	3
CDT-2062	CIRCULAR	309.03	308.78	533	3
CDT-2063	CIRCULAR	306.10	305.10	274	2.5
CDT-2064	CIRCULAR	305.10	303.70	281	3
CDT-2065	CIRCULAR	303.70	301.44	398	3
CDT-2066	CIRCULAR	300.07	298.64	1,255	2.5
CDT-2067	CIRCULAR	298.14	295.98	1,377	3
CDT-2068	CIRCULAR	295.88	290.00	140	3
CDT-2069	CIRCULAR	291.62	291.28	67	3
CDT-2070	CIRCULAR	291.28	289.73	310	3
CDT-2071	CIRCULAR	289.73	289.22	105	3
CDT-2072	CIRCULAR	296.57	296.25	197	3
CDT-2073	CIRCULAR	296.25	296.17	51	3
CDT-2074	CIRCULAR	281.15	280.58	285	2.5
CDT-2075	CIRCULAR	280.58	279.99	455	2.5
CDT-2076	CIRCULAR	279.99	265.29	65	2.5
CDT-2077	CIRCULAR	276.19	275.32	273	2.5
CDT-2078	CIRCULAR	275.32	273.65	455	2.5
CDT-2079	CIRCULAR	274.93	273.65	342	2.5
CDT-2080	CIRCULAR	333.84	332.11	488	2.5
CDT-2082	CIRCULAR	341.49	341.14	261	2.5
CDT-2083	CIRCULAR	341.14	340.88	179	2.5
CDT-2084	CIRCULAR	340.88	340.75	147	2.5
CDT-2085	CIRCULAR	340.75	340.66	102	2.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2086	CIRCULAR	340.66	340.64	38	2.5
CDT-2087	CIRCULAR	316.24	315.93	172	2.5
CDT-2088	CIRCULAR	316.71	316.24	426	2.5
CDT-2089	CIRCULAR	317.25	316.49	587	2.5
CDT-2090	CIRCULAR	312.49	312.11	312	2.5
CDT-2091	CIRCULAR	312.11	311.67	381	2.5
CDT-2092	CIRCULAR	311.67	311.21	381	2.5
CDT-2093	CIRCULAR	311.21	310.88	267	2.5
CDT-2094	CIRCULAR	310.88	310.15	236	2.5
CDT-2095	CIRCULAR	312.74	312.21	330	2.5
CDT-2096	CIRCULAR	312.21	311.57	300	2.5
CDT-2097	CIRCULAR	311.57	311.52	45	2.5
CDT-2098	CIRCULAR	311.52	310.98	328	2.5
CDT-2099	CIRCULAR	310.98	310.57	262	2.5
CDT-2100	CIRCULAR	310.57	310.34	122	2.5
CDT-2101	CIRCULAR	310.34	309.74	300	2.5
CDT-2102	CIRCULAR	309.74	309.47	132	2.5
CDT-2103	CIRCULAR	309.47	308.91	285	2.5
CDT-2104	CIRCULAR	308.91	308.28	311	2.5
CDT-2105	CIRCULAR	308.28	307.99	145	2.5
CDT-2106	CIRCULAR	302.36	301.48	292	2.5
CDT-2107	CIRCULAR	301.48	300.69	315	2.5
CDT-2108	CIRCULAR	300.69	299.92	398	2.5
CDT-2109	CIRCULAR	299.92	299.67	86	2.5
CDT-2110	CIRCULAR	299.67	299.03	298	2.5
CDT-2111	CIRCULAR	299.03	298.50	204	2.5
CDT-2112	CIRCULAR	298.50	297.30	86	2.5
CDT-2113	CIRCULAR	302.08	301.72	360	2.5
CDT-2114	CIRCULAR	301.72	301.36	355	2.5
CDT-2115	CIRCULAR	301.36	301.23	129	2.5
CDT-2116	CIRCULAR	301.23	300.07	718	2.5
CDT-2117	CIRCULAR	292.31	290.31	342	2.5
CDT-2118	CIRCULAR	290.31	290.00	182	2.5
CDT-2119	CIRCULAR	297.02	296.47	342	2.5
CDT-2120	CIRCULAR	296.47	296.29	172	2.5
CDT-2121	CIRCULAR	296.29	295.79	504	2.5
CDT-2122	CIRCULAR	295.79	294.91	679	2.5
CDT-2123	CIRCULAR	294.91	293.51	100	2.5
CDT-2124	CIRCULAR	296.29	292.31	211	2.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2125	CIRCULAR	294.84	294.53	322	2.5
CDT-2126	CIRCULAR	294.53	294.20	307	2.5
CDT-2127	CIRCULAR	294.20	293.88	306	2.5
CDT-2128	CIRCULAR	293.88	293.57	309	2.5
CDT-2129	CIRCULAR	293.57	293.14	272	2.5
CDT-2130	CIRCULAR	293.14	292.60	253	2.5
CDT-2131	CIRCULAR	303.75	302.11	465	2.5
CDT-2132	CIRCULAR	309.52	308.78	273	2.5
CDT-2133	CIRCULAR	319.52	317.81	519	3.5
CDT-2134	CIRCULAR	273.65	271.60	552	3
CDT-2135	CIRCULAR	271.60	268.00	100	3
CDT-2136	CIRCULAR	287.29	289.22	878	4.5
CDT-2137	CIRCULAR	284.66	284.86	35	2
CDT-2138	CIRCULAR	284.86	284.79	35	2
CDT-2143	CIRCULAR	327.77	327.00	378	1.5
CDT-2144	CIRCULAR	329.18	329.00	327	1
CDT-2145	CIRCULAR	329.81	329.18	54	1.25
CDT-2146	CIRCULAR	283.61	283.13	323	4
CDT-2147	CIRCULAR	283.13	282.90	153	4
CDT-2148	CIRCULAR	282.90	282.81	63	4
CDT-2149	CIRCULAR	282.81	282.46	231	4
CDT-2150	CIRCULAR	282.46	281.81	368	4
CDT-2152	CIRCULAR	320.57	320.18	389	3
CDT-2153	CIRCULAR	320.18	319.86	316	3.5
CDT-2154	CIRCULAR	319.86	319.59	263	3.5
CDT-2155	CIRCULAR	319.59	319.55	44	3.5
CDT-2156	CIRCULAR	319.55	319.29	266	3.5
CDT-2157	CIRCULAR	319.29	319.09	204	3.5
CDT-2158	CIRCULAR	319.09	318.67	421	3.5
CDT-2159	CIRCULAR	318.67	318.40	263	3.5
CDT-2160	CIRCULAR	318.40	318.37	31	3.5
CDT-2161	CIRCULAR	318.37	317.99	379	4
CDT-2162	CIRCULAR	317.99	317.68	306	4
CDT-2163	CIRCULAR	317.68	317.39	289	4
CDT-2164	CIRCULAR	317.39	317.03	356	4
CDT-2165	CIRCULAR	317.03	316.99	44	4
CDT-2166	CIRCULAR	304.67	304.67	116	4
CDT-2168	FORCE_MAIN	343.33	324.00	35	1.333
CDT-2169	FORCE_MAIN	324.00	325.00	349	1.333

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2170	FORCE_MAIN	325.00	326.50	977	1.333
CDT-2171	FORCE_MAIN	326.50	326.50	19	1.333
CDT-2172	FORCE_MAIN	326.50	322.50	317	1.333
CDT-2173	FORCE_MAIN	322.50	325.50	159	1.333
CDT-2174	FORCE_MAIN	325.50	325.50	341	1.333
CDT-2175	FORCE_MAIN	325.50	328.00	74	1.333
CDT-2176	FORCE_MAIN	328.00	328.00	28	1.333
CDT-2177	CIRCULAR	325.50	324.00	275	2
CDT-2178	CIRCULAR	324.00	323.50	47	2
CDT-2179	CIRCULAR	324.00	323.08	168	2
CDT-2180	CIRCULAR	276.00	275.50	118	4.5
CDT-2181	CIRCULAR	288.22	287.99	231	4.5
CDT-2182	CIRCULAR	288.83	288.22	612	4.5
CDT-2183	CIRCULAR	293.26	292.75	244	2.5
CDT-2184	CIRCULAR	292.65	292.36	150	2.5
CDT-2185	CIRCULAR	292.00	292.13	64	2.5
CDT-2186	CIRCULAR	287.05	287.00	27	2.5
CDT-2187	CIRCULAR	299.04	294.57	413	1.25
CDT-2188	CIRCULAR	294.57	292.96	826	2
CDT-2189	CIRCULAR	293.58	293.20	178	3.5
CDT-2190	CIRCULAR	293.20	292.70	226	3.5
CDT-2191	CIRCULAR	292.70	291.99	332	3.5
CDT-2192	CIRCULAR	291.73	291.84	54	3
CDT-2193	CIRCULAR	294.31	293.87	443	3
CDT-2194	CIRCULAR	296.22	296.03	277	2.5
CDT-2195	CIRCULAR	296.72	296.32	578	2.5
CDT-2196	CIRCULAR	293.04	292.92	60	2.5
CDT-2197	CIRCULAR	296.98	296.75	318	2.5
CDT-2198	CIRCULAR	297.27	297.08	271	2.5
CDT-2199	CIRCULAR	290.83	290.45	170	1.5
CDT-2200	CIRCULAR	288.60	287.00	181	1.5
CDT-2203	CIRCULAR	287.25	287.10	50	2
CDT-2204	CIRCULAR	329.00	328.00	104	2
CDT-2205	CIRCULAR	323.61	323.46	311	2
CDT-2206	CIRCULAR	323.46	323.30	316	2
CDT-2207	CIRCULAR	328.00	327.55	447	2
CDT-2208	CIRCULAR	332.18	331.08	500	2
CDT-2209	CIRCULAR	323.00	315.00	106	2.5
CDT-2210	CIRCULAR	298.97	298.24	1,217	5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2211	CIRCULAR	298.24	298.22	31	5
CDT-2212	CIRCULAR	308.95	308.29	466	2
CDT-2213	CIRCULAR	308.24	308.04	95	2
CDT-2214	CIRCULAR	307.50	307.26	190	4.5
CDT-2215	CIRCULAR	307.26	306.82	404	4.5
CDT-2216	CIRCULAR	306.82	306.44	339	4.5
CDT-2217	CIRCULAR	306.44	306.07	340	4.5
CDT-2218	CIRCULAR	306.07	305.70	332	4.5
CDT-2219	CIRCULAR	305.70	305.25	327	4.5
CDT-2220	CIRCULAR	305.25	304.83	299	4.5
CDT-2221	CIRCULAR	304.83	304.14	488	4.5
CDT-2222	CIRCULAR	333.89	333.79	38	1.5
CDT-2223	FORCE_MAIN	300.00	301.00	497	0.667
CDT-2224	FORCE_MAIN	301.00	305.75	91	0.667
CDT-2225	FORCE_MAIN	305.75	305.75	38	0.667
CDT-2226	CIRCULAR	320.80	319.94	244	3
CDT-2227	CIRCULAR	319.94	319.00	265	3
CDT-2228	CIRCULAR	319.44	318.95	252	3.5
CDT-2229	CIRCULAR	317.82	317.40	416	2
CDT-2230	CIRCULAR	297.42	297.42	40	3.5
CDT-2231	CIRCULAR	297.62	297.42	347	3.5
CDT-2232	CIRCULAR	297.42	296.85	982	3.5
CDT-2233	CIRCULAR	285.87	283.54	458	1.75
CDT-2234	CIRCULAR	282.74	282.58	205	2.5
CDT-2235	CIRCULAR	306.25	302.36	88	1.167
CDT-2236	CIRCULAR	302.26	302.02	262	2
CDT-2237	CIRCULAR	302.02	301.70	357	2
CDT-2238	CIRCULAR	301.70	301.25	500	2
CDT-2239	CIRCULAR	301.25	300.83	500	2
CDT-2240	CIRCULAR	342.36	342.00	374	2
CDT-2241	FORCE_MAIN	345.00	344.97	36	0.5
CDT-2242	FORCE_MAIN	344.97	344.53	497	0.5
CDT-2243	FORCE_MAIN	344.53	344.50	45	0.5
CDT-2244	FORCE_MAIN	344.50	344.00	594	0.5
CDT-2245	CIRCULAR	344.00	340.06	645	1.5
CDT-2246	CIRCULAR	340.06	337.96	344	1.75
CDT-2247	CIRCULAR	316.29	315.71	329	2
CDT-2248	CIRCULAR	315.71	315.60	130	2
CDT-2249	CIRCULAR	315.60	315.40	50	2

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2250	CIRCULAR	322.00	321.90	75	2
CDT-2251	CIRCULAR	318.00	317.61	338	1.75
CDT-2252	CIRCULAR	317.61	317.23	310	1.75
CDT-2253	CIRCULAR	319.00	318.62	94	1
CDT-2254	CIRCULAR	330.19	330.00	138	1.5
CDT-2255	CIRCULAR	330.69	330.10	395	1
CDT-2256	CIRCULAR	330.00	329.24	1,152	1.5
CDT-2257	CIRCULAR	329.24	329.00	231	1.5
CDT-2258	CIRCULAR	316.09	316.50	411	3
CDT-2259	CIRCULAR	315.88	316.09	203	3
CDT-2260	CIRCULAR	323.55	321.30	44	3
CDT-2261	CIRCULAR	328.92	327.30	898	1
CDT-2262	CIRCULAR	327.30	326.82	216	1.25
CDT-2263	CIRCULAR	326.82	326.49	696	1.25
CDT-2264	CIRCULAR	326.24	325.51	349	1.5
CDT-2265	CIRCULAR	325.26	324.58	702	1.75
CDT-2266	CIRCULAR	329.44	329.12	294	2
CDT-2267	CIRCULAR	328.46	328.15	301	2
CDT-2268	CIRCULAR	307.98	307.28	651	3
CDT-2269	CIRCULAR	307.28	306.68	593	3
CDT-2270	CIRCULAR	306.68	306.58	80	3
CDT-2271	CIRCULAR	306.58	306.21	268	3
CDT-2272	CIRCULAR	276.63	274.93	412	2
CDT-2273	CIRCULAR	277.98	276.83	330	2
CDT-2274	CIRCULAR	279.37	277.98	475	1.75
CDT-2275	CIRCULAR	279.21	279.37	24	3
CDT-2276	CIRCULAR	282.40	280.18	542	0.67
CDT-2277	CIRCULAR	295.17	295.06	53	3
CDT-2278	CIRCULAR	300.38	300.17	180	2.5
CDT-2279	CIRCULAR	307.99	307.84	17	2.5
CDT-2280	CIRCULAR	306.21	306.35	15	3
CDT-2281	CIRCULAR	326.48	320.91	15	2
CDT-2282_EX	CIRCULAR	315.00	314.50	50	3
CDT-2283	CIRCULAR	300.07	300.07	10	2.5
CDT-2284	CIRCULAR	301.00	301.50	10	3
CDT-2285	CIRCULAR	326.21	325.84	75	2
CDT-2286	CIRCULAR	310.20	310.20	61	1
CDT-2287	CIRCULAR	298.00	298.00	106	2
CDT-2290	CIRCULAR	329.85	330.10	62	2

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2291	CIRCULAR	303.43	303.32	225	2.5
CDT-2292	CIRCULAR	323.81	323.63	57	2
CDT-2293	CIRCULAR	316.00	312.88	60	1
CDT-2294	CIRCULAR	292.00	292.20	45	3
CDT-2295	CIRCULAR	278.00	277.95	4	2
CDT-2296	CIRCULAR	303.00	299.50	60	2.25
CDT-2297	CIRCULAR	291.87	291.55	104	1
CDT-2298	CIRCULAR	281.25	281.25	50	2
CDT-2299	CIRCULAR	304.18	304.18	7	1.67
CDT-2300	CIRCULAR	309.00	309.00	8	2
CDT-2302	CIRCULAR	335.00	335.00	30	2
CDT-2303	CIRCULAR	307.00	307.00	15	1.5
CDT-2306	CIRCULAR	306.00	306.00	8	1
CDT-2307	CIRCULAR	320.50	320.50	25	2
CDT-2308	CIRCULAR	318.77	318.66	154	2.5
CDT-2309	CIRCULAR	323.68	319.66	456	1.5
CDT-2310	CIRCULAR	324.55	323.68	461	1.5
CDT-2311	CIRCULAR	325.02	324.80	150	1.25
CDT-2312	CIRCULAR	318.56	318.17	274	2.5
CDT-2313	CIRCULAR	322.77	322.74	22	1.5
CDT-2314	CIRCULAR	322.64	322.19	558	1.5
CDT-2315	CIRCULAR	322.19	321.47	400	1.5
CDT-2316	CIRCULAR	323.43	324.38	20	2.5
CDT-2317	CIRCULAR	321.47	320.94	441	1.5
CDT-2318	CIRCULAR	323.46	321.50	23	0.67
CDT-2319	CIRCULAR	320.94	322.95	536	1.5
CDT-2320	CIRCULAR	322.90	319.93	204	1.5
CDT-2321	CIRCULAR	319.93	319.28	323	1.5
CDT-2322	CIRCULAR	319.83	316.50	277	1.75
CDT-2323	CIRCULAR	288.40	288.40	60	1.5
CDT-2324	CIRCULAR	291.00	290.90	120	2.5
CDT-2325	CIRCULAR	291.99	291.00	126	3.5
CDT-2330	CIRCULAR	287.05	288.40	10	3.5
CDT-2331	CIRCULAR	305.40	304.40	100	2
CDT-2332	CIRCULAR	304.25	302.50	2,520	4
CDT-291	CIRCULAR	332.00	330.00	221	1.75
CDT-295	CIRCULAR	324.38	324.30	195	2.5
CDT-297	CIRCULAR	324.30	324.18	300	2.5
CDT-299	CIRCULAR	324.18	323.82	551	2.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-301	CIRCULAR	323.82	323.60	338	2.5
CDT-305	CIRCULAR	323.04	322.82	104	1.75
CDT-31	CIRCULAR	322.00	321.30	2,394	3
CDT-333	CIRCULAR	300.61	299.84	852	2
CDT-335	CIRCULAR	299.84	299.67	184	2.5
CDT-337	CIRCULAR	300.09	299.67	233	2
CDT-339	CIRCULAR	299.67	298.91	748	2.5
CDT-341	CIRCULAR	299.72	299.14	769	2
CDT-343	CIRCULAR	298.81	298.49	723	3
CDT-345	CIRCULAR	298.24	297.89	651	3.5
CDT-347	CIRCULAR	299.31	298.75	736	2
CDT-349	CIRCULAR	297.89	297.62	475	3.5
CDT-353	CIRCULAR	300.46	298.74	1,584	2.5
CDT-355	CIRCULAR	297.59	296.99	597	3.5
CDT-361	CIRCULAR	303.06	301.75	721	2.25
CDT-363	CIRCULAR	301.50	301.25	896	2.5
CDT-367	CIRCULAR	301.25	300.89	387	2.5
CDT-369	CIRCULAR	300.89	300.60	278	2.5
CDT-37	CIRCULAR	320.00	312.00	356	2.5
CDT-371	CIRCULAR	302.66	300.44	1,003	2
CDT-375	CIRCULAR	303.00	301.70	698	1.5
CDT-377	CIRCULAR	316.05	314.77	641	2
CDT-379	CIRCULAR	314.77	312.42	1,568	2
CDT-381	CIRCULAR	312.42	309.60	1,877	2
CDT-39	CIRCULAR	335.21	333.71	963	2
CDT-393	CIRCULAR	299.00	296.80	90	1.75
CDT-397	CIRCULAR	291.58	291.08	177	1.5
CDT-401	CIRCULAR	304.80	303.90	293	1.5
CDT-403	CIRCULAR	300.60	300.00	248	2
CDT-405	CIRCULAR	300.60	300.00	284	3.5
CDT-409	CIRCULAR	301.44	298.80	380	2
CDT-41	CIRCULAR	333.21	331.11	1,204	2.5
CDT-411	CIRCULAR	297.30	296.58	429	3.5
CDT-413	CIRCULAR	298.19	297.58	1,170	2.5
CDT-415	CIRCULAR	299.00	298.69	521	2
CDT-417	CIRCULAR	296.58	294.00	182	3.5
CDT-419	CIRCULAR	302.12	301.44	1,061	2
CDT-421	CIRCULAR	300.44	300.00	631	3
CDT-423	CIRCULAR	300.00	299.13	757	3

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-425	CIRCULAR	299.13	297.80	995	3
CDT-429	CIRCULAR	321.01	320.95	150	1.67
CDT-43	CIRCULAR	332.00	331.61	251	2
CDT-431	CIRCULAR	321.06	321.01	70	2
CDT-433	CIRCULAR	316.76	315.35	376	1
CDT-435	CIRCULAR	316.76	315.35	385	1
CDT-437	CIRCULAR	319.40	316.80	693	1
CDT-439	CIRCULAR	318.85	315.35	1,086	1.5
CDT-441	CIRCULAR	318.90	318.85	41	1.5
CDT-443	CIRCULAR	317.23	316.29	584	2
CDT-447	CIRCULAR	322.00	321.00	974	1
CDT-45	CIRCULAR	330.61	329.97	315	3
CDT-451	CIRCULAR	320.95	320.80	313	1.666
CDT-455	CIRCULAR	326.22	319.50	1,846	1
CDT-457	CIRCULAR	326.22	319.50	1,869	1
CDT-465	CIRCULAR	326.93	326.31	416	2
CDT-467	CIRCULAR	326.93	325.47	942	1
CDT-469	CIRCULAR	329.00	326.25	1,395	1.75
CDT-47	CIRCULAR	329.97	328.99	253	3
CDT-471	CIRCULAR	329.67	328.16	1,221	1
CDT-483	CIRCULAR	329.37	328.00	542	4
CDT-49	CIRCULAR	328.99	327.50	358	3
CDT-51	CIRCULAR	306.00	304.26	517	2
CDT-53	CIRCULAR	304.26	298.00	344	2
CDT-55	CIRCULAR	301.33	299.77	1,244	3.5
CDT-57	CIRCULAR	299.77	299.36	304	3.5
CDT-587	CIRCULAR	334.25	326.46	288	3
CDT-59	CIRCULAR	299.36	298.60	440	3.5
CDT-591	CIRCULAR	333.80	326.46	621	2.5
CDT-597	CIRCULAR	320.80	319.94	428	3
CDT-601	CIRCULAR	310.15	308.50	1,227	3.5
CDT-603	CIRCULAR	308.00	304.25	5,417	4
CDT-605	CIRCULAR	277.50	276.00	273	2.5
CDT-607	CIRCULAR	276.00	275.00	996	2.5
CDT-61	CIRCULAR	298.60	298.00	461	3.5
CDT-621	CIRCULAR	331.10	327.50	621	2
CDT-63	CIRCULAR	305.63	302.76	1,147	2
CDT-631	CIRCULAR	330.70	330.45	250	3.5
CDT-633	CIRCULAR	325.25	324.32	278	3.5

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-639	CIRCULAR	296.99	296.85	555	3.5
CDT-65	CIRCULAR	302.76	302.39	302	2
CDT-655	CIRCULAR	315.00	313.74	762	2
CDT-657	CIRCULAR	312.74	312.40	161	3
CDT-659	CIRCULAR	311.90	310.15	492	3.5
CDT-67	CIRCULAR	302.39	300.22	614	2.5
CDT-673	CIRCULAR	317.00	310.00	1,232	2
CDT-69	CIRCULAR	298.40	298.00	849	5
CDT-701	CIRCULAR	300.44	300.00	221	2
CDT-71	CIRCULAR	310.13	309.76	307	2
CDT-713	TRAPEZOIDAL	300.85	298.00	5	2
CDT-73	CIRCULAR	309.66	309.14	362	2
CDT-75	CIRCULAR	298.90	298.50	318	5
CDT-757	CIRCULAR	300.60	300.38	215	2.5
CDT-761	CIRCULAR	304.00	302.27	494	3
CDT-763	CIRCULAR	304.53	303.94	538	2.5
CDT-765	CIRCULAR	302.94	302.74	305	3.5
CDT-767	CIRCULAR	302.74	301.50	341	3.5
CDT-769	CIRCULAR	301.50	301.33	1,077	3.5
CDT-77	CIRCULAR	312.00	310.25	1,191	2.5
CDT-773	CIRCULAR	307.00	306.50	304	2
CDT-775	CIRCULAR	306.00	303.94	917	2.5
CDT-777	CIRCULAR	301.00	299.09	718	2.5
CDT-779	CIRCULAR	302.50	301.50	1,099	2
CDT-781	CIRCULAR	297.78	297.52	979	2
CDT-79	CIRCULAR	314.16	312.82	1,313	3.5
CDT-793	CIRCULAR	301.20	300.44	305	2
CDT-795	CIRCULAR	302.50	299.09	2,879	4
CDT-797	CIRCULAR	299.09	293.51	2,779	4
CDT-801	CIRCULAR	294.21	293.60	1,262	2.5
CDT-803	CIRCULAR	292.60	291.99	645	3.5
CDT-805	CIRCULAR	291.99	290.12	819	3.5
CDT-807	CIRCULAR	290.12	289.39	553	3.5
CDT-809	CIRCULAR	289.39	289.07	285	3.5
CDT-81	CIRCULAR	312.73	308.15	1,205	4
CDT-811	CIRCULAR	289.07	288.60	439	3.5
CDT-813	CIRCULAR	288.60	288.29	236	3.5
CDT-815	CIRCULAR	295.20	294.21	681	2.5
CDT-819	CIRCULAR	291.00	290.89	791	2

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-823	CIRCULAR	289.90	282.90	209	3
CDT-825	CIRCULAR	291.36	289.90	720	3
CDT-827	CIRCULAR	293.42	291.76	826	3
CDT-829	CIRCULAR	291.76	291.36	184	3
CDT-831	CIRCULAR	297.72	297.56	334	2
CDT-833	CIRCULAR	297.06	296.26	400	2.5
CDT-835	CIRCULAR	296.26	293.92	1,412	2.5
CDT-837	CIRCULAR	293.51	289.20	2,479	4
CDT-841	CIRCULAR	283.98	283.75	151	4
CDT-843	CIRCULAR	286.36	283.79	2,600	4
CDT-845	CIRCULAR	282.32	280.34	2,618	4
CDT-847	CIRCULAR	280.34	278.68	1,173	4
CDT-849	CIRCULAR	278.68	269.61	3,766	4
CDT-851	CIRCULAR	269.61	262.00	508	4
CDT-853	CIRCULAR	274.00	262.00	556	1.5
CDT-855	CIRCULAR	289.22	289.00	578	4.5
CDT-859	CIRCULAR	324.00	320.50	779	2
CDT-861	CIRCULAR	334.00	327.50	845	5
CDT-863	CIRCULAR	337.00	334.00	1,429	5
CDT-865	CIRCULAR	339.00	338.37	528	2
CDT-869	CIRCULAR	338.12	337.40	930	2.25
CDT-871	CIRCULAR	336.65	334.25	1,120	3
CDT-873	CIRCULAR	339.25	338.00	446	2
CDT-875	CIRCULAR	338.00	337.50	310	2
CDT-877	CIRCULAR	337.25	336.80	293	2.25
CDT-879	CIRCULAR	336.80	335.88	761	2.25
CDT-883	CIRCULAR	335.63	333.80	1,201	2.5
CDT-885	CIRCULAR	336.33	335.83	489	2
CDT-887	CIRCULAR	335.33	334.77	273	2.5
CDT-889	CIRCULAR	334.77	334.25	251	2.5
CDT-89	CIRCULAR	304.14	302.66	1,346	5
CDT-891	CIRCULAR	334.25	331.70	1,693	2.5
CDT-893	CIRCULAR	333.12	332.20	858	2.5
CDT-895	CIRCULAR	332.54	332.29	583	2
CDT-897	CIRCULAR	332.29	332.20	457	2
CDT-899	CIRCULAR	327.82	326.75	962	2
CDT-901	CIRCULAR	326.51	325.25	1,342	3
CDT-903	CIRCULAR	326.80	326.51	237	3
CDT-905	CIRCULAR	330.10	328.48	1,090	2

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-907	CIRCULAR	327.98	327.60	709	2.5
CDT-909	CIRCULAR	327.10	326.80	450	3
CDT-91	CIRCULAR	302.66	300.27	1,048	5
CDT-911	CIRCULAR	327.98	327.98	76	2.5
CDT-913	CIRCULAR	328.80	328.48	1,311	2
CDT-915	CIRCULAR	329.00	328.80	251	2
CDT-917	CIRCULAR	317.90	317.82	269	1.5
CDT-919	CIRCULAR	333.70	329.37	2,542	4
CDT-921	CIRCULAR	330.24	329.36	652	2
CDT-923	CIRCULAR	328.86	326.50	1,061	2.5
CDT-925	CIRCULAR	326.50	326.25	499	2.5
CDT-93	CIRCULAR	300.27	298.90	1,150	5
CDT-937	CIRCULAR	316.80	316.76	12	1
CDT-939	CIRCULAR	326.31	317.23	237	2
CDT-941	CIRCULAR	326.25	317.23	315	1.75
CDT-943	CIRCULAR	327.16	326.93	140	1
CDT-945	FORCE_MAIN	321.06	320.76	476	1.67
CDT-95	CIRCULAR	308.00	305.66	659	2
CDT-953	CIRCULAR	321.00	320.80	850	1.5
CDT-955	CIRCULAR	322.00	321.00	332	1.5
CDT-959	CIRCULAR	290.91	279.30	289	2
CDT-961	CIRCULAR	291.89	279.30	706	4
CDT-963	CIRCULAR	296.64	296.19	576	2
CDT-965	CIRCULAR	296.19	295.06	939	2
CDT-967	CIRCULAR	295.51	295.06	733	2
CDT-969	CIRCULAR	294.56	294.37	169	2.5
CDT-97	CIRCULAR	306.98	306.14	1,410	3
CDT-971	CIRCULAR	293.87	292.89	1,064	3
CDT-973	CIRCULAR	295.97	295.45	342	2
CDT-975	CIRCULAR	295.45	295.02	276	2
CDT-977	CIRCULAR	294.52	294.15	564	2.5
CDT-979	CIRCULAR	293.65	293.29	244	3
CDT-981	CIRCULAR	293.29	293.12	318	3
CDT-983	CIRCULAR	293.12	292.89	383	3
CDT-985	CIRCULAR	291.71	290.91	502	2
CDT-987	CIRCULAR	291.98	291.71	181	2
CDT-99	CIRCULAR	306.00	304.50	1,129	2.5
CDT-997	CIRCULAR	285.72	285.00	348	3
CDT-999	CIRCULAR	287.42	287.28	570	2

Table E-2. Existing Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-AkerGoshen	CIRCULAR	300.59	300.46	40	2.5
CDT-E1	CIRCULAR	303.70	302.90	671	1.75
CDT-Sallee	CIRCULAR	310.30	307.50	1,480	1.5
CG-11	CIRCULAR	313.73	307.89	3,875	2.5
CG-12	CIRCULAR	307.89	306.00	1,217	2.5
CG-13a	CIRCULAR	304.50	301.44	1,400	4
CG-13b	CIRCULAR	301.44	299.82	1,789	4
CG-14	CIRCULAR	299.82	295.47	2,841	4
CG-15	CIRCULAR	295.47	290.00	433	4
Goshen1	CIRCULAR	288.83	284.08	2,587	4
Link-02	CIRCULAR	323.80	322.00	914	4.5
Link-03	CIRCULAR	287.00	286.90	9	2.5
Link-04	CIRCULAR	287.00	286.90	9	2.5
Link-05	CIRCULAR	320.87	319.00	123	1
Link-06	CIRCULAR	286.00	283.00	190	1.5
CDT-GD1	CIRCULAR	254.00	254.00	137	2.5
CDT-3000_Ex	CIRCULAR	11.70	0.00	15	2
CDT-2326	TRAPEZOIDAL	290.90	288.40	400	1.5
CDT-2327	TRAPEZOIDAL	290.90	288.40	400	1.5
CDT-2328	TRAPEZOIDAL	290.90	288.40	400	1.5
CDT-2329	TRAPEZOIDAL	288.40	288.40	400	1.5
CDT-1197	TRAPEZOIDAL	288.40	288.40	400	1.5
CDTN-44	CIRCULAR	297.48	297.05	100	2.25
CDT-DUMMY	TRAPEZOIDAL	307.90	307.40	400	1.5

Table E-3. Existing Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STO-G1	STORAGE	290.00	16.5
STOR-10	STORAGE	320.50	15.0
STOR-100	STORAGE	292.00	15.0
STOR-106	STORAGE	280.00	14.0
STOR-110	STORAGE	280.00	12.0
STOR-112	STORAGE	304.67	20.3
STOR-12	STORAGE	316.00	13.0
STOR-14	STORAGE	310.00	10.5
STOR-16	STORAGE	327.50	19.5
STOR-18	STORAGE	298.00	20.0
STOR-202	STORAGE	331.00	23.0
STOR-204	STORAGE	282.29	10.5
STOR-206	STORAGE	297.42	8.6
STOR-207-B1	STORAGE	289.79	10.0
STOR-207-B2	STORAGE	292.79	6.0
STOR-209	STORAGE	330.31	6.0
STOR-210	STORAGE	329.81	5.5
STOR-211	STORAGE	322.31	13.0
STOR-212	STORAGE	329.31	5.0
STOR-213	STORAGE	330.80	3.0
STOR-217	STORAGE	329.81	15.5
STOR-218	STORAGE	288.79	14.0
STOR-22	STORAGE	282.90	20.1
STOR-221	STORAGE	264.79	14.5
STOR-222	STORAGE	271.29	15.0
STOR-223	STORAGE	268.29	16.0
STOR-224	STORAGE	265.29	17.0
STOR-225	STORAGE	268.79	14.5
STOR-226	STORAGE	279.29	15.5
STOR-227	STORAGE	305.79	4.5
STOR-229	STORAGE	323.80	7.0
STOR-231	STORAGE	284.79	13.5
STOR-233	STORAGE	264.29	21.0
STOR-234	STORAGE	337.50	12.5
STOR-235-A	STORAGE	252.50	7.5
STOR-235-B	STORAGE	248.00	12.0
STOR-235-C	STORAGE	250.50	9.5
STOR-235-D	STORAGE	245.50	14.0
STOR-236	STORAGE	281.81	16.5

Table E-3. Existing Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STOR-237	STORAGE	286.00	6.0
STOR-238	STORAGE	287.00	2.0
STOR-239	STORAGE	280.40	13.0
STOR-24	STORAGE	253.50	29.5
STOR-240	STORAGE	277.00	26.0
STOR-241	STORAGE	295.06	8.0
STOR-242_GC	STORAGE	317.00	5.0
STOR-250	STORAGE	307.84	17.1
STOR-251	STORAGE	300.00	10.0
STOR-252	STORAGE	276.00	13.0
STOR-253	STORAGE	314.00	9.0
STOR-254	STORAGE	318.62	17.4
STOR-255	STORAGE	303.35	17.0
STOR-256	STORAGE	320.91	16.8
STOR-257	STORAGE	311.00	13.0
STOR-258_EX	STORAGE	310.00	33.5
STOR-259	STORAGE	316.50	26.5
STOR-260	STORAGE	293.50	15.5
STOR-261	STORAGE	297.07	15.9
STOR-262	STORAGE	300.00	12.5
STOR-263	STORAGE	319.32	31.2
STOR-264	STORAGE	295.75	22.3
STOR-265	STORAGE	303.40	13.1
STOR-266	STORAGE	321.84	20.2
STOR-267	STORAGE	310.00	19.0
STOR-268	STORAGE	315.48	18.0
STOR-269	STORAGE	297.00	23.0
Stor-270r	STORAGE	281.83	17.9
Stor-271r	STORAGE	281.83	17.9
STOR-272	STORAGE	326.10	26.9
STOR-273	STORAGE	299.03	11.0
STOR-274	STORAGE	294.46	15.4
STOR-275	STORAGE	324.50	15.5
STOR-276	STORAGE	313.60	13.4
STOR-277	STORAGE	316.00	28.3
STOR-278	STORAGE	312.00	19.0
STOR-279	STORAGE	290.70	20.3
STOR-28	STORAGE	289.00	13.0
STOR-280	STORAGE	304.07	27.9

Table E-3. Existing Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STOR-281	STORAGE	273.75	28.0
STOR-282	STORAGE	282.80	23.2
STOR-283	STORAGE	326.00	20.0
STOR-284	STORAGE	288.50	14.5
STOR-285	STORAGE	275.50	27.5
STOR-286	STORAGE	279.75	25.5
STOR-287	STORAGE	297.05	15.0
STOR-288	STORAGE	339.00	9.8
STOR-289	STORAGE	300.00	10.8
STOR-290	STORAGE	326.45	27.1
STOR-291	STORAGE	312.88	22.1
STOR-30	STORAGE	324.72	20.0
STOR-34	STORAGE	330.00	4.0
STOR-36	STORAGE	322.82	4.0
STOR-38	STORAGE	291.87	10.4
STOR-44	STORAGE	287.00	12.0
STOR-48	STORAGE	268.00	16.0
STOR-50	STORAGE	303.90	4.6
STOR-52	STORAGE	300.00	10.0
STOR-54	STORAGE	294.00	12.0
STOR-58	STORAGE	326.21	12.4
STOR-60	STORAGE	279.30	17.7
STOR-62	STORAGE	285.00	10.0
STOR-64	STORAGE	288.40	14.6
STOR-66	STORAGE	275.00	26.0
STOR-68	STORAGE	278.50	21.8
STOR-70_EX	STORAGE	315.00	23.0
STOR-72	STORAGE	328.00	5.0
STOR-74	STORAGE	316.50	14.5
STOR-76	STORAGE	322.50	8.0
STOR-78	STORAGE	319.00	11.0
STOR-80	STORAGE	300.00	8.0
STOR-82	STORAGE	301.00	12.0
STOR-84	STORAGE	305.50	10.5
STOR-86	STORAGE	299.09	18.4
STOR-88	STORAGE	313.51	15.0
STOR-92	STORAGE	316.97	6.0
STOR-94	STORAGE	302.00	21.6
STOR-96	STORAGE	318.00	10.5

Table E-3. Existing Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
SJCT-2013	STORAGE	310.00	16.5

Table E-4. Existing Conditions Pumps

Pump Name	Startup Depth	Shutoff Depth
PUMP-11	6.00	4.00
PUMP-13	6.00	3.00
PUMP-15	13.00	3.67
PUMP-201	12.67	5.07
PUMP-202	9.93	7.93
PUMP-203	8.00	6.00
PUMP-204	7.00	4.00
PUMP-205	5.00	2.25
PUMP-206_EX	7.03	3.03
PUMP-207	7.50	4.50
PUMP-208	8.00	3.00
PUMP-21	10.67	5.07
PUMP-210	9.58	6.08
PUMP-211	15.50	7.25
PUMP-212	4.00	2.50
PUMP-213	4.00	2.75
PUMP-214	8.00	4.50
PUMP-215	8.00	2.00
PUMP-216	7.50	4.00
PUMP-217	6.50	3.00
PUMP-218	15.00	10.00
PUMP-219	4.00	2.00
PUMP-220	7.00	4.00
PUMP-221	7.00	4.00
PUMP-222	3.00	1.00
PUMP-223	8.00	4.00
PUMP-224	8.00	4.00
PUMP-225	5.00	3.00
PUMP-226	7.00	3.00
PUMP-227	7.50	0.50
PUMP-228	10.00	6.00
PUMP-229	13.75	5.75
PUMP-23	13.90	10.90
PUMP-230	6.00	3.50
PUMP-27	6.00	4.00
PUMP-29	5.00	3.00
PUMP-31	7.00	3.00
PUMP-35	6.00	3.00
PUMP-39	7.50	0.50

Table E-4. Existing Conditions Pumps

Pump Name	Startup Depth	Shutoff Depth
PUMP-41	7.00	4.00
PUMP-43	5.00	2.25
PUMP-45	9.00	6.00
PUMP-49	6.00	3.00
PUMP-51	5.00	1.00
PUMP-53	13.75	5.75
PUMP-57	5.00	2.50
PUMP-61	7.00	4.00
PUMP-63	10.00	8.00
PUMP-65	5.00	2.00
PUMP-G1	4.00	2.00
PUMP-GD1	21.00	4.00

Table E-5. Existing Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-100	OUTFALL	308.00	1.0
OFALL-102	OUTFALL	322.25	2.0
OFALL-104	OUTFALL	310.00	0.0
OFALL-106	OUTFALL	333.00	2.3
OFALL-108	OUTFALL	331.00	2.0
OFALL-112	OUTFALL	320.00	0.0
OFALL-114	OUTFALL	316.00	0.0
OFALL-116	OUTFALL	314.00	0.0
OFALL-118	OUTFALL	314.00	0.0
OFALL-120	OUTFALL	307.00	3.5
OFALL-122	OUTFALL	307.00	2.5
OFALL-124	OUTFALL	298.00	0.0
OFALL-126	OUTFALL	302.00	0.0
OFALL-128	OUTFALL	304.00	0.0
OFALL-130	OUTFALL	303.00	2.0
OFALL-132	OUTFALL	308.00	0.0
OFALL-134	OUTFALL	302.78	0.0
OFALL-136	OUTFALL	308.00	0.0
OFALL-138	OUTFALL	344.00	0.0
OFALL-140	OUTFALL	342.70	0.0
OFALL-142	OUTFALL	338.00	0.0
OFALL-144	OUTFALL	342.00	0.0
OFALL-146	OUTFALL	332.00	0.0
OFALL-148	OUTFALL	331.00	0.0
OFALL-150	OUTFALL	330.00	0.0
OFALL-152	OUTFALL	329.00	0.0
OFALL-154	OUTFALL	327.50	2.0
OFALL-156	OUTFALL	326.50	0.0
OFALL-158	OUTFALL	326.00	0.0
OFALL-160	OUTFALL	325.50	0.0
OFALL-162	OUTFALL	323.08	2.0
OFALL-168	OUTFALL	321.00	1.0
OFALL-170	OUTFALL	320.80	1.5
OFALL-172	OUTFALL	320.25	0.0
OFALL-174	OUTFALL	319.90	1.7
OFALL-176	OUTFALL	319.50	1.0
OFALL-178	OUTFALL	319.00	0.0
OFALL-180	OUTFALL	318.50	0.0
OFALL-182	OUTFALL	318.50	0.0

Table E-5. Existing Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-184	OUTFALL	316.80	0.0
OFALL-186	OUTFALL	315.35	1.5
OFALL-188	OUTFALL	314.50	0.0
OFALL-190	OUTFALL	314.00	0.0
OFALL-192	OUTFALL	313.40	0.0
OFALL-194	OUTFALL	309.60	2.0
OFALL-196	OUTFALL	311.50	0.0
OFALL-198	OUTFALL	309.80	2.0
OFALL-200	OUTFALL	309.00	0.0
OFALL-2001	OUTFALL	328.00	4.0
OFALL-2002	OUTFALL	313.52	0.0
OFALL-2003	OUTFALL	303.00	0.0
OFALL-2004	OUTFALL	327.55	2.0
OFALL-2005	OUTFALL	342.50	0.0
OFALL-2006	OUTFALL	298.22	5.0
OFALL-2007	OUTFALL	308.00	0.0
OFALL-2008	OUTFALL	317.05	0.0
OFALL-2009	OUTFALL	316.00	0.0
OFALL-2010	OUTFALL	316.00	0.0
OFALL-2011	OUTFALL	317.05	0.0
OFALL-2012	OUTFALL	320.00	0.0
OFALL-2013	OUTFALL	314.00	0.0
OFALL-2014	OUTFALL	314.00	0.0
OFALL-2015	OUTFALL	314.00	0.0
OFALL-2016	OUTFALL	323.42	4.0
OFALL-2017	OUTFALL	329.00	0.0
OFALL-2018	OUTFALL	329.00	1.5
OFALL-2019	OUTFALL	321.00	0.0
OFALL-202	OUTFALL	329.45	0.0
OFALL-2020	OUTFALL	344.50	0.0
OFALL-2021	OUTFALL	305.75	0.7
OFALL-2022	OUTFALL	319.50	0.0
OFALL-2023	OUTFALL	319.50	0.0
OFALL-2024	OUTFALL	302.78	0.0
OFALL-2025	OUTFALL	309.00	0.0
OFALL-2026	OUTFALL	312.00	0.0
OFALL-2027	OUTFALL	344.00	0.0
OFALL-2028	OUTFALL	319.90	1.7
OFALL-2029	OUTFALL	319.50	1.0

Table E-5. Existing Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-2030	OUTFALL	315.35	1.0
OFALL-2031	OUTFALL	315.35	1.0
OFALL-2032	OUTFALL	341.50	0.0
OFALL-2033	OUTFALL	301.00	0.0
OFALL-2034	OUTFALL	333.60	2.3
OFALL-2035	OUTFALL	327.00	1.5
OFALL-2036	OUTFALL	321.00	0.0
OFALL-2037	OUTFALL	313.52	0.0
OFALL-2038	OUTFALL	304.00	0.0
OFALL-2039	OUTFALL	308.00	0.0
OFALL-204	OUTFALL	348.00	0.0
OFALL-2040	OUTFALL	310.00	0.0
OFALL-2041	OUTFALL	0.00	0.0
OFALL-2042	OUTFALL	308.00	0.0
OFALL-2043	OUTFALL	315.00	0.0
OFALL-2045	OUTFALL	309.00	2.0
OFALL-2046	OUTFALL	335.00	2.0
OFALL-2047	OUTFALL	307.00	1.5
OFALL-2050	OUTFALL	306.00	1.0
OFALL-2051	OUTFALL	320.50	2.0
OFALL-206	OUTFALL	341.50	0.0
OFALL-208	OUTFALL	317.05	2.0
OFALL-210	OUTFALL	333.50	0.0
OFALL-212	OUTFALL	322.63	0.0
OFALL-214	OUTFALL	323.00	0.0
OFALL-216	OUTFALL	321.00	0.0
OFALL-218	OUTFALL	321.00	0.0
OFALL-220	OUTFALL	314.50	0.0
OFALL-222	OUTFALL	322.00	0.0
OFALL-224	OUTFALL	308.00	0.0
OFALL-226	OUTFALL	315.00	0.0
OFALL-228	OUTFALL	309.58	0.0
OFALL-230	OUTFALL	325.00	0.0
OFALL-232	OUTFALL	304.80	1.8
OFALL-64	OUTFALL	285.00	0.0
OFALL-66	OUTFALL	301.00	0.0
OFALL-68	OUTFALL	298.00	2.0
OFALL-72	OUTFALL	336.00	0.0
OFALL-74	OUTFALL	333.60	2.3

Table E-5. Existing Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-76	OUTFALL	330.26	2.5
OFALL-78	OUTFALL	329.00	0.0
OFALL-80	OUTFALL	327.00	3.5
OFALL-82	OUTFALL	324.00	1.8
OFALL-84	OUTFALL	320.03	2.0
OFALL-86	OUTFALL	327.80	0.0
OFALL-92	OUTFALL	296.42	3.5
OFALL-94	OUTFALL	303.00	3.0
OFALL-96	OUTFALL	310.00	2.0
OFALL-98	OUTFALL	308.00	1.0
OFALL-GD1	OUTFALL	282.00	0.0
OFALL-3000_EX	OUTFALL	315.00	2.0
OFALL-DUMMY	OUTFALL	307.40	1.5

APPENDIX F

EXISTING CONDITIONS MODEL RESULTS – FLAGGED JUNCTIONS AND STORAGE AREAS

Table F-1. Existing Conditions Junction Criteria Exceedances and Disposition

Legend for Junctions, Dividers and Outfalls
>6 inches for longer than 72 hours – red
> 6 inches for less than 72 hours – orange

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Ground Elevation (ft)	Max HGL (ft)	HGL Above Ground (ft)	HGL Above Ground (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
JCT-2092	JUNCTION	6444688.3	2003910.6	276.19	2.5	278.69	284.1	5.41	64.92	320.57	19234.2	red	No separate project was identified because the result occurs at an isolated Auto Plaza model stub with no tributary area and conflicting ponded-area inputs. Correct the model representation before using this result for capital planning.
JCT-2189	JUNCTION	6477229.6	2005667.3	324	1.33	325.33	336.55	11.22	134.64	490.12	29407.2	red	No separate project was identified because the flagged HGL reflects pressure in a force-main alignment with no directly tributary surface area, not sustained surface flooding.
JCT-2190	JUNCTION	6478203.7	2005319.2	326.5	1.33	327.83	331.95	4.12	49.44	489.78	29386.8	red	No separate project was identified because the flagged HGL reflects pressure in a force-main alignment with no directly tributary surface area, not sustained surface flooding.
JCT-2280	JUNCTION	6478202.5	2005337.8	326.5	1.33	327.83	332.15	4.32	51.84	489.78	29386.8	red	No separate project was identified because the flagged HGL reflects pressure in a force-main alignment with no directly tributary surface area, not sustained surface flooding.
JCT-2281	JUNCTION	6477234	2005317.4	325	1.33	326.33	335.26	8.93	107.16	490.03	29401.8	red	No separate project was identified because the flagged HGL reflects pressure in a force-main alignment with no directly tributary surface area, not sustained surface flooding.
DIV-10	JUNCTION	6471702.9	2004040.7	318.9	5.1	324	325.13	1.13	13.56	0.3	18	orange	No separate project was identified because the exceedance is brief and localized at a node represented with 100 square feet of surface storage.
DIV-16	JUNCTION	6475208.8	2005942.6	326.93	2	328.93	329.67	0.74	8.88	0.36	21.6	orange	No separate project was identified because the exceedance is brief at a no-tributary node represented with 100 square feet of surface storage.
JCT-1062	JUNCTION	6464009.4	1993032.5	303.43	6.47	309.9	310.57	0.67	8.04	0.02	1.2	orange	No separate project was identified because this is a transient pump-discharge condition at a no-tributary node represented with 100 square feet of surface storage.
JCT-1092	JUNCTION	6466595.9	1992106.8	304.67	9.4	314.07	314.68	0.61	7.32	0.03	1.8	orange	No separate project was identified because the exceedance is brief at a no-tributary junction represented with 100 square feet of surface storage. It is separate from the wet-well deficiency addressed by Existing Conditions CIP 1.
JCT-2191	JUNCTION	6478206.9	2005002.3	322.5	1.33	323.83	331.04	7.21	86.52	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2192	JUNCTION	6478215.3	2004838.8	325.5	1.33	326.83	330.54	3.71	44.52	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2193	JUNCTION	6478224	2004501.3	325.5	1.33	326.83	330.93	4.1	49.2	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2228	JUNCTION	6457158.2	2004408.4	300	0.67	300.67	337.41	36.74	440.88	0	0	orange	No separate project was identified because the node is within the Oakwest HOA force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2229	JUNCTION	6457195.3	2003917.4	301	0.67	301.67	316.14	14.47	173.64	0	0	orange	No separate project was identified because the node is within the Oakwest HOA force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2243	JUNCTION	6485396.6	2002164.1	345	0.5	345.5	355.29	9.79	117.48	29.47	1768.2	orange	No separate project was identified because the result reflects force-main pressure interacting with the 100-square-foot surface-storage setting, not independent surface flooding.
JCT-2244	JUNCTION	6485375.9	2002193.5	344.97	0.5	345.47	353.64	8.17	98.04	29.43	1765.8	orange	No separate project was identified because the result reflects force-main pressure interacting with the 100-square-foot surface-storage setting, not independent surface flooding.
JCT-2245	JUNCTION	6484885	2002127.2	344.53	0.5	345.03	350.2	5.17	62.04	0	0	orange	No separate project was identified because the node is within the South Lovers force main; the high HGL represents system pressure and the results show no surface overflow.
JCT-2246	JUNCTION	6484853.2	2002095.4	344.5	0.5	345	349.81	4.81	57.72	0	0	orange	No separate project was identified because the node is within the South Lovers force main; the high HGL represents system pressure and the results show no surface overflow.
JCT-2283	JUNCTION	6477273.1	2005667.6	324	20.66	344.66	346.71	2.05	24.6	0	0	orange	No separate project was identified because this is a pump-discharge/force-main pressure node with no directly tributary surface area, not a surface-flooding location.
JCT-388	JUNCTION	6462643.6	2003927.5	301.25	9.75	311	311.88	0.88	10.56	0.05	3	orange	No separate project was identified because the exceedance is brief and sensitive to the 100-square-foot surface-storage representation.

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Ground Elevation (ft)	Max HGL (ft)	HGL Above Ground (ft)	HGL Above Ground (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
JCT-486	JUNCTION	6471691.8	2004040.8	318.85	5.15	324	325.07	1.07	12.84	0.3	18	orange	No separate project was identified because the exceedance is brief and localized within the DIV-10 drainage path and is sensitive to the 100-square-foot surface-storage representation.

Table F-2. Existing Conditions Storage-Node Criteria Exceedances and Disposition

Legend for Storage Nodes

Above top of basin longer than 72 hours - red

Above top of basin less than 72 hrs - orange

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Modeled Top Elevation (ft)	Max HGL (ft)	HGL Above Modeled Top (ft)	HGL Above Modeled Top (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
STOR-213	STORAGE	6484098	1997400	330.8	3	333.8	333.86	0.06	0.72	0	0	orange	No separate project was identified based on this result alone because the modeled exceedance is only 0.06 foot. Confirm the as-built basin top elevation and overflow condition.
STOR-227	STORAGE	6463433.5	2002592.2	305.79	4.5	310.29	315.29	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume. Confirm the basin top and outlet elevations.
STOR-251	STORAGE	6462654.9	1996739.4	300	10	310	310.85	0.85	10.2	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-253	STORAGE	6471667.2	2011369.9	314	9	323	328	5	60	0.01	0.6	orange	No separate project was identified because this is a pump wet well and the exceedance is a brief surcharge condition with negligible overflow volume.
STOR-257	STORAGE	6475171.4	2004248.1	311	13	324	327.62	3.62	43.44	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-265	STORAGE	6466549.5	1997419.8	303.4	13.1	316.5	321.5	5	60	4.65	279	orange	The flagged wet-well condition is addressed by Existing Conditions CIP 1; no additional project was identified.
STOR-274	STORAGE	6463999.3	1993059.9	294.46	15.44	309.9	314.9	5	60	0.01	0.6	orange	No separate project was identified because this is a pump wet well and the exceedance is a brief surcharge condition with negligible overflow volume.
STOR-276	STORAGE	6472364.4	1998848.3	313.6	13.4	327	327.01	0.01	0.12	0	0	orange	No separate project was identified because this is a pump wet well and the small HGL exceedance represents wet-well surcharge rather than basin overtopping.
STOR-289	STORAGE	6462009.6	1998945.5	300	10.75	310.75	310.86	0.11	1.32	0	0	orange	No separate project was identified because this is a pump wet well and the small HGL exceedance represents wet-well surcharge rather than basin overtopping.
STOR-48	STORAGE	6444235.7	2003030.8	268	16	284	289	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume. Confirm the basin top elevation.

APPENDIX G

FUTURE CONDITIONS – MODEL JUNCTIONS AND DIVIDERS, CONDUITS, STORAGE AREAS, PUMPS, AND OUTFALLS

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-01vista_GP	JUNCTION	326.78	13.2	100
JCT-100_GP	JUNCTION	301.50	18.5	109,125
JCT-1002	JUNCTION	315.93	6.1	3,374,686
JCT-1004	JUNCTION	314.72	3.8	238,452
JCT-1006	JUNCTION	315.55	3.5	83,447
JCT-1008	JUNCTION	315.71	4.3	435,687
JCT-1000	JUNCTION	311.86	6.1	460,418
JCT-1010	JUNCTION	310.30	5.0	98,854
JCT-1012	JUNCTION	306.25	10.8	188,535
JCT-1014	JUNCTION	307.54	8.5	95,000
JCT-1016	JUNCTION	307.98	8.4	73,412
JCT-1018	JUNCTION	308.48	7.7	146,012
JCT-102_GP	JUNCTION	302.74	17.3	207,106
JCT-1020	JUNCTION	310.00	8.3	872,792
JCT-1022	JUNCTION	313.70	6.3	72,273
JCT-1024	JUNCTION	314.01	8.0	71,989
JCT-1026	JUNCTION	314.30	7.7	64,792
JCT-1028	JUNCTION	314.55	7.5	184,609
JCT-1030	JUNCTION	315.03	7.0	119,390
JCT-1032	JUNCTION	315.42	6.6	37,886
JCT-1034	JUNCTION	315.69	6.3	260,880
JCT-1036	JUNCTION	316.02	6.0	93,027
JCT-1038	JUNCTION	316.86	5.1	2,067,412
JCT-104_GP	JUNCTION	302.94	15.1	66,174
JCT-1040	JUNCTION	312.89	9.1	410,055
JCT-1044	JUNCTION	314.05	8.0	73,728
JCT-1046	JUNCTION	314.47	8.5	58,868
JCT-1048	JUNCTION	314.72	9.3	85,959
JCT-1050	JUNCTION	315.35	8.7	27,826
JCT-1052	JUNCTION	307.28	12.4	406,982
JCT-1054	JUNCTION	306.68	12.6	352,358
JCT-1056	JUNCTION	306.58	12.7	127,333
JCT-1058	JUNCTION	317.61	6.4	479,027
JCT-106_GP	JUNCTION	304.53	13.5	878,708
JCT-1060	JUNCTION	316.42	7.6	81,922
JCT-1062	JUNCTION	303.43	6.5	100
JCT-1064	JUNCTION	298.43	10.3	164,358
JCT-1066	JUNCTION	298.86	9.8	624,482
JCT-1068	JUNCTION	299.30	9.4	203,171

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1070	JUNCTION	299.77	9.2	528,184
JCT-1072	JUNCTION	300.64	7.6	1,014,352
JCT-1076	JUNCTION	302.04	8.2	422,527
JCT-1078	JUNCTION	302.50	9.5	93,174
JCT-108_GP	JUNCTION	306.00	14.0	69,635
JCT-1080	JUNCTION	304.30	8.7	1,197,826
JCT-1082	JUNCTION	303.39	8.6	100
JCT-1084	JUNCTION	304.17	7.8	68,506
JCT-1086	JUNCTION	304.53	7.5	52,579
JCT-1088	JUNCTION	305.18	6.8	164,540
JCT-1090	JUNCTION	304.35	9.0	602,170
JCT-1092	JUNCTION	304.67	9.4	100
JCT-1094	JUNCTION	305.54	7.2	129,870
JCT-1096	JUNCTION	305.67	7.8	164,346
JCT-1098	JUNCTION	306.00	8.5	813,097
JCT-110_GP	JUNCTION	307.00	13.0	687,289
JCT-1100	JUNCTION	306.99	9.0	505,634
JCT-1102	JUNCTION	307.50	8.5	292,317
JCT-1104	JUNCTION	307.26	13.7	100
JCT-1106	JUNCTION	307.57	12.4	537,510
JCT-1108	JUNCTION	308.12	11.9	100
JCT-1110	JUNCTION	309.99	10.0	222,428
JCT-1112	JUNCTION	311.36	6.6	273,357
JCT-1114	JUNCTION	308.96	13.0	450,003
JCT-1116	JUNCTION	308.91	13.1	39,364
JCT-1118	JUNCTION	309.87	12.1	100
JCT-1120	JUNCTION	309.75	12.3	287,818
JCT-1122	JUNCTION	310.35	11.7	14,182
JCT-1124	JUNCTION	311.46	12.5	14,568
JCT-1126	JUNCTION	305.19	14.8	100
JCT-1128	JUNCTION	306.55	13.5	561,737
JCT-1130	JUNCTION	309.53	10.5	250,005
JCT-1132	JUNCTION	309.02	11.0	72,386
JCT-1134	JUNCTION	308.09	7.9	100
JCT-1138	JUNCTION	308.93	6.1	100
JCT-1140	JUNCTION	309.11	4.9	100
JCT-1142	JUNCTION	309.88	4.1	100
JCT-1144	JUNCTION	310.68	3.3	100
JCT-1146	JUNCTION	310.34	3.7	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1150	JUNCTION	310.90	3.1	291,227
JCT-1154	JUNCTION	317.49	8.5	594,933
JCT-1156_GP	JUNCTION	313.90	12.1	100
JCT-1158_GP	JUNCTION	312.60	13.4	199,000
JCT-116	JUNCTION	302.50	7.5	478,422
JCT-1160_GP	JUNCTION	313.20	12.8	128,078
JCT-1162_GP	JUNCTION	314.41	11.6	504,903
JCT-1170_GP	JUNCTION	318.12	9.9	301,100
JCT-1172_GP	JUNCTION	320.78	7.2	145,324
JCT-1174_GP	JUNCTION	323.90	4.1	448,814
JCT-1176_GP	JUNCTION	324.62	3.4	378,883
JCT-1178_GP	JUNCTION	319.52	10.5	100
JCT-118	JUNCTION	301.00	5.0	443,666
JCT-1180_GP	JUNCTION	318.85	11.2	317,600
JCT-1182	JUNCTION	317.86	12.1	858,062
JCT-1184	JUNCTION	318.54	11.5	217,272
JCT-1186	JUNCTION	319.34	12.7	119,051
JCT-1188	JUNCTION	319.52	14.5	100
JCT-1190	JUNCTION	320.50	13.5	184,121
JCT-1192	JUNCTION	325.52	8.5	82,010
JCT-1194	JUNCTION	321.10	8.9	117,187
JCT-1196	JUNCTION	322.04	10.0	204,938
JCT-1198	JUNCTION	324.50	9.5	225,098
JCT-120	JUNCTION	297.78	8.2	469,254
JCT-1200	JUNCTION	323.90	6.1	571,064
JCT-1202	JUNCTION	324.50	5.5	144,832
JCT-1204	JUNCTION	325.95	4.1	261,817
JCT-1206	JUNCTION	326.70	3.3	968,733
JCT-1208	JUNCTION	303.37	8.6	100
JCT-1210	JUNCTION	304.64	7.4	57,941
JCT-1214	JUNCTION	303.47	8.5	30,922
JCT-1236	JUNCTION	304.12	9.9	100
JCT-1238	JUNCTION	306.50	7.5	35,457
JCT-1240	JUNCTION	307.70	8.3	96,276
JCT-1242	JUNCTION	308.60	7.4	45,564
JCT-1244	JUNCTION	308.15	5.9	332,438
JCT-1246	JUNCTION	304.28	9.7	228,270
JCT-1248	JUNCTION	305.42	6.6	425,851
JCT-1250	JUNCTION	306.16	7.8	243,718

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1252	JUNCTION	306.76	6.2	1,380,786
JCT-1254	JUNCTION	334.80	3.2	100
JCT-1256	JUNCTION	336.10	4.0	100
JCT-1258	JUNCTION	332.22	2.8	100
JCT-1260	JUNCTION	327.40	10.6	161,402
JCT-1262	JUNCTION	325.45	12.6	100
JCT-1266	JUNCTION	326.83	13.2	642,577
JCT-1268	JUNCTION	327.98	10.0	175,230
JCT-1270_GP	JUNCTION	313.20	12.8	100
JCT-1274	JUNCTION	313.12	8.9	176,384
JCT-1278_GP	JUNCTION	296.95	15.1	23,550
JCT-1280_GP	JUNCTION	299.51	10.5	19,692
JCT-1282_GP	JUNCTION	296.50	15.5	3,826
JCT-1284_GP	JUNCTION	298.75	15.3	3,048
JCT-1286_GP	JUNCTION	299.60	14.4	14,505
JCT-1288_GP	JUNCTION	297.42	14.6	27,834
JCT-1290_GP	JUNCTION	297.95	14.1	100
JCT-1292_GP	JUNCTION	299.60	14.4	7,834
JCT-1296_GP	JUNCTION	301.85	12.2	100
JCT-1298_GP	JUNCTION	300.72	13.3	11,779
JCT-1302	JUNCTION	299.16	8.8	446,500
JCT-1304	JUNCTION	301.77	8.2	100
JCT-1306	JUNCTION	307.41	6.6	80,656
JCT-1308	JUNCTION	307.61	8.4	100
JCT-1310	JUNCTION	308.37	9.6	100
JCT-1312	JUNCTION	309.11	8.9	349,823
JCT-1314	JUNCTION	310.12	7.9	362,346
JCT-1316	JUNCTION	310.71	7.3	11,566
JCT-1318	JUNCTION	312.12	7.9	567,062
JCT-1320	JUNCTION	314.74	7.3	423,454
JCT-1322	JUNCTION	315.46	8.5	611,112
JCT-1324	JUNCTION	316.77	9.2	2,305,153
JCT-1326	JUNCTION	307.32	8.7	100
JCT-1328	JUNCTION	308.26	9.7	100
JCT-1330	JUNCTION	309.80	10.2	100
JCT-1332	JUNCTION	310.70	7.3	100
JCT-1334	JUNCTION	309.91	2.5	100
JCT-134	JUNCTION	289.07	14.9	164,241
JCT-1340	JUNCTION	309.14	10.9	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-1342	JUNCTION	308.24	10.3	298,605
JCT-1346	JUNCTION	299.83	4.2	299,109
JCT-1348	JUNCTION	301.33	2.7	188,229
JCT-1350	JUNCTION	301.62	8.4	100
JCT-136	JUNCTION	289.39	14.6	46,980
JCT-138	JUNCTION	290.12	11.9	221,251
JCT-1380	JUNCTION	306.00	4.0	298,039
JCT-1382	JUNCTION	288.38	5.6	100
JCT-1384	JUNCTION	287.33	6.7	100
JCT-1386	JUNCTION	280.79	13.2	100
JCT-1388	JUNCTION	288.60	15.4	100
JCT-1392	JUNCTION	300.07	10.1	100
JCT-1394	JUNCTION	300.00	12.0	100
JCT-1398	JUNCTION	302.26	3.9	1,000
JCT-140	JUNCTION	291.99	14.0	100
JCT-1400	JUNCTION	301.63	6.4	352,320
JCT-1402	JUNCTION	299.75	8.3	129,133
JCT-1404	JUNCTION	316.80	13.2	492,502
JCT-1406	JUNCTION	317.72	8.3	252,780
JCT-142	JUNCTION	292.60	11.4	146,778
JCT-144	JUNCTION	294.21	7.8	117,210
JCT-146	JUNCTION	295.20	6.8	127,229
JCT-148	JUNCTION	291.00	13.0	381,186
JCT-152_GP	JUNCTION	297.72	12.3	437,690
JCT-154_GP	JUNCTION	297.06	12.9	503,255
JCT-155_FCIP11	JUNCTION	326.71	11.3	433,613
JCT-155_Mooney_GP	JUNCTION	300.44	15.6	100
JCT-155W_Mooney_GP	JUNCTION	308.69	0.0	330,619
JCT-156_GP	JUNCTION	296.26	12.0	143,268
JCT-156_Mooney_GP	JUNCTION	307.80	6.7	100
JCT-157_GP	JUNCTION	327.95	11.1	1,667,088
JCT-158_GP	JUNCTION	293.42	10.6	247,895
JCT-159_KWF_GP	JUNCTION	292.87	6.0	100
JCT-160_GP	JUNCTION	291.76	12.2	100
JCT-161_KWF_GP	JUNCTION	293.25	5.8	100
JCT-162_GP	JUNCTION	291.36	12.6	230,764
JCT-163_KWF_GP	JUNCTION	292.90	5.0	100
JCT-163_Rd152_GP	JUNCTION	348.20	7.8	1,216,529
JCT-163_Shirk	JUNCTION	292.13	7.6	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-164_GP	JUNCTION	289.90	14.1	568,962
JCT-164_KWF_GP	JUNCTION	292.98	5.0	282,282
JCT-168	JUNCTION	276.00	6.0	100
JCT-170	JUNCTION	274.00	8.0	100
JCT-172	JUNCTION	269.61	12.4	887,796
JCT-174	JUNCTION	278.68	11.3	100
JCT-176	JUNCTION	280.34	11.7	328,941
JCT-178	JUNCTION	282.32	11.7	363,191
JCT-180	JUNCTION	282.08	11.9	413,871
JCT-182	JUNCTION	283.98	16.0	783,993
JCT-196_GP	JUNCTION	324.00	6.0	441,388
JCT-198	JUNCTION	330.70	11.6	280,619
JCT-200	JUNCTION	333.12	10.9	163,817
JCT-2001	JUNCTION	299.53	5.0	100
JCT-2002	JUNCTION	299.50	5.0	100
JCT-2003	JUNCTION	299.27	5.0	100
JCT-2004	JUNCTION	299.00	5.0	100
JCT-2005	JUNCTION	298.97	5.0	100
JCT-2006	JUNCTION	323.80	11.3	38,717
JCT-2007	JUNCTION	323.20	11.3	16,751
JCT-2008	JUNCTION	322.55	11.5	16,609
JCT-2009	JUNCTION	322.13	11.7	1,000
JCT-2010_GP	JUNCTION	285.10	16.4	100
JCT-2011_GP	JUNCTION	284.66	15.9	100
JCT-2012	JUNCTION	283.61	16.5	100
JCT-2013_GP	JUNCTION	314.76	14.3	101,473
JCT-2014_GP	JUNCTION	314.25	14.5	100
JCT-2015_GP	JUNCTION	313.55	15.7	100
JCT-2016_GP	JUNCTION	317.81	10.5	100
JCT-2017_GP	JUNCTION	317.55	10.6	100
JCT-2018_GP	JUNCTION	317.53	10.5	100
JCT-2019_GP	JUNCTION	317.47	10.4	100
JCT-202	JUNCTION	332.29	9.7	272,118
JCT-2020	JUNCTION	323.87	15.9	100
JCT-2021	JUNCTION	323.47	17.5	100
JCT-2025_GP	JUNCTION	286.38	14.2	100
JCT-2026_GP	JUNCTION	285.83	14.7	100
JCT-2027_GP	JUNCTION	285.63	15.2	100
JCT-2028_GP	JUNCTION	285.42	15.7	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2029_GP	JUNCTION	305.68	11.3	8,121
JCT-2033_GP	JUNCTION	315.93	16.5	355,661
JCT-2034_GP	JUNCTION	315.49	16.9	100
JCT-2035_GP	JUNCTION	315.00	16.7	816,145
JCT-2036_GP	JUNCTION	314.16	17.1	190,819
JCT-2037	JUNCTION	308.78	8.0	65,553
JCT-2038	JUNCTION	304.50	13.8	283,996
JCT-2041	JUNCTION	282.24	8.6	68,464
JCT-2042	JUNCTION	282.12	8.8	68,464
JCT-2043	JUNCTION	281.97	9.3	100
JCT-2044	JUNCTION	281.86	9.4	100
JCT-2045	JUNCTION	281.67	9.3	100
JCT-2046	JUNCTION	281.24	9.0	180,462
JCT-2047	JUNCTION	280.43	9.4	180,462
JCT-2048	JUNCTION	279.60	10.2	100
JCT-2049	JUNCTION	279.21	10.8	100
JCT-2050	JUNCTION	308.04	10.3	100
JCT-2051	JUNCTION	307.50	11.1	100
JCT-2052	JUNCTION	307.05	12.1	100
JCT-2053	JUNCTION	306.70	12.0	100
JCT-2054	JUNCTION	306.36	13.0	100
JCT-2055	JUNCTION	306.21	12.7	100
JCT-2056	JUNCTION	326.75	13.7	485,729
JCT-2057	JUNCTION	326.39	14.9	100
JCT-2058	JUNCTION	326.04	14.1	100
JCT-206	JUNCTION	325.25	14.8	100
JCT-2060	JUNCTION	324.90	15.9	100
JCT-2061	JUNCTION	325.17	15.3	100
JCT-2062_GP	JUNCTION	340.64	9.9	100
JCT-2063_GP	JUNCTION	339.99	12.2	100
JCT-2064_GP	JUNCTION	339.52	13.3	100
JCT-2066_GP	JUNCTION	308.88	8.5	100
JCT-2067_GP	JUNCTION	308.80	8.0	36,416
JCT-2068_GP	JUNCTION	308.16	9.1	100
JCT-2069_GP	JUNCTION	308.00	9.3	257,660
JCT-2071	JUNCTION	309.03	8.0	1,026,484
JCT-2073	JUNCTION	306.10	7.2	354,750
JCT-2074	JUNCTION	305.10	8.3	130,324
JCT-2075	JUNCTION	303.70	10.7	274,191

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2076	JUNCTION	301.44	14.2	100
JCT-2077	JUNCTION	300.07	10.3	611,329
JCT-2078	JUNCTION	298.14	12.6	430,255
JCT-2079	JUNCTION	295.88	14.3	559,432
JCT-208	JUNCTION	326.50	13.5	100
JCT-2081	JUNCTION	291.62	10.6	100
JCT-2082	JUNCTION	291.28	10.7	100
JCT-2083	JUNCTION	289.73	12.1	100
JCT-2084	JUNCTION	289.22	14.0	100
JCT-2088	JUNCTION	281.15	4.9	283,092
JCT-2089	JUNCTION	280.58	6.0	100
JCT-2090	JUNCTION	279.99	7.0	100
JCT-2092	JUNCTION	276.19	9.0	-
JCT-2093	JUNCTION	275.32	11.2	100,000
JCT-2094	JUNCTION	273.65	11.9	106,152
JCT-2095	JUNCTION	274.93	11.9	100
JCT-2096_GP	JUNCTION	305.29	11.3	315,705
JCT-2097_GP	JUNCTION	333.84	9.7	67,614
JCT-2099_GP	JUNCTION	341.49	9.1	100
JCT-210	JUNCTION	328.86	9.1	232,497
JCT-2100_GP	JUNCTION	341.14	8.5	111,032
JCT-2101_GP	JUNCTION	340.88	9.1	100
JCT-2102_GP	JUNCTION	340.75	9.5	100
JCT-2103_GP	JUNCTION	340.66	9.7	100
JCT-2104_GP	JUNCTION	316.24	15.4	100
JCT-2105_GP	JUNCTION	316.71	14.1	169,339
JCT-2106_GP	JUNCTION	317.25	10.2	134,441
JCT-2108_GP	JUNCTION	312.49	12.6	168,467
JCT-2109_GP	JUNCTION	312.11	12.0	100
JCT-2110_GP	JUNCTION	311.67	11.3	54,492
JCT-2111_GP	JUNCTION	311.21	11.3	100
JCT-2112_GP	JUNCTION	310.88	12.2	100
JCT-2113_GP	JUNCTION	307.50	15.9	529,647
JCT-2114_GP	JUNCTION	312.74	9.7	700,735
JCT-2115_GP	JUNCTION	312.21	10.9	100
JCT-2116_GP	JUNCTION	311.57	12.7	100
JCT-2117_GP	JUNCTION	311.52	11.9	100
JCT-2118_GP	JUNCTION	310.98	12.0	100
JCT-2119_GP	JUNCTION	310.57	12.4	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-212	JUNCTION	330.24	7.8	85,254
JCT-2120_GP	JUNCTION	310.34	12.4	284,244
JCT-2121_GP	JUNCTION	309.74	12.4	100
JCT-2122_GP	JUNCTION	309.47	12.7	100
JCT-2123_GP	JUNCTION	308.91	13.4	100
JCT-2124_GP	JUNCTION	308.28	16.0	232,650
JCT-2125_GP	JUNCTION	307.99	17.6	100
JCT-2126_GP	JUNCTION	302.36	10.0	140,738
JCT-2127_GP	JUNCTION	301.48	10.2	119,539
JCT-2128_GP	JUNCTION	300.69	11.7	62,462
JCT-2129_GP	JUNCTION	299.92	12.3	100
JCT-2130_GP	JUNCTION	299.67	12.3	27,452
JCT-2131_GP	JUNCTION	299.03	13.5	100
JCT-2132_GP	JUNCTION	298.50	15.6	89,604
JCT-2134	JUNCTION	302.08	9.7	125,648
JCT-2135	JUNCTION	301.72	9.8	125,648
JCT-2136	JUNCTION	301.36	9.3	125,647
JCT-2137	JUNCTION	301.23	9.4	125,647
JCT-2138	JUNCTION	292.31	10.6	100
JCT-2139	JUNCTION	290.31	11.9	100
JCT-214	JUNCTION	326.51	13.5	100
JCT-2140	JUNCTION	287.29	15.9	100
JCT-2141	JUNCTION	297.02	7.6	380,656
JCT-2142	JUNCTION	296.47	7.7	20,788
JCT-2143	JUNCTION	296.29	7.7	100
JCT-2144	JUNCTION	295.79	7.4	100
JCT-2145	JUNCTION	294.91	8.1	100
JCT-2146	JUNCTION	293.51	8.7	324,475
JCT-2147	JUNCTION	294.84	7.2	641,152
JCT-2148	JUNCTION	294.53	7.5	45,635
JCT-2149	JUNCTION	294.20	9.0	100
JCT-2150	JUNCTION	293.88	9.9	121,995
JCT-2151	JUNCTION	293.57	9.3	110,182
JCT-2152	JUNCTION	293.14	8.5	95,467
JCT-2154	JUNCTION	303.75	7.3	301,088
JCT-2156	JUNCTION	309.52	8.1	755,909
JCT-2157_GP	JUNCTION	304.67	11.0	100
JCT-2158_GP	JUNCTION	303.82	11.4	431,822
JCT-2159_GP	JUNCTION	303.67	11.7	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-216	JUNCTION	326.80	11.2	226,567
JCT-2160_GP	JUNCTION	302.90	12.6	100
JCT-2161	JUNCTION	271.60	14.0	100
JCT-2162_GP	JUNCTION	284.86	15.7	100
JCT-2163	JUNCTION	317.03	14.4	100
JCT-2164	JUNCTION	322.10	11.5	1,000
JCT-2165	JUNCTION	320.38	14.1	100,745
JCT-2168	JUNCTION	329.18	5.8	100
JCT-2169	JUNCTION	283.13	17.1	100
JCT-2170	JUNCTION	282.90	18.6	100
JCT-2171	JUNCTION	282.81	18.1	100
JCT-2172	JUNCTION	282.46	19.0	100
JCT-2174	JUNCTION	320.57	10.9	258,591
JCT-2175	JUNCTION	320.18	12.9	675,015
JCT-2176	JUNCTION	319.86	14.0	100
JCT-2177	JUNCTION	319.59	12.6	100
JCT-2178	JUNCTION	319.55	14.7	100
JCT-2179	JUNCTION	319.29	12.5	100
JCT-218	JUNCTION	327.10	10.9	175,945
JCT-2180	JUNCTION	319.09	12.4	29,584
JCT-2181	JUNCTION	318.67	13.7	161,093
JCT-2182	JUNCTION	318.40	14.3	17,096
JCT-2183	JUNCTION	318.37	14.2	395,557
JCT-2184	JUNCTION	317.99	14.5	22,421
JCT-2185	JUNCTION	317.68	14.8	100
JCT-2186	JUNCTION	317.39	14.8	100
JCT-2189	JUNCTION	324.00	1.3	-
JCT-2190	JUNCTION	326.50	1.3	-
JCT-2191	JUNCTION	322.50	1.3	-
JCT-2192	JUNCTION	325.50	1.3	-
JCT-2193	JUNCTION	325.50	1.3	-
JCT-2194	JUNCTION	328.00	1.3	-
JCT-2195	JUNCTION	325.50	6.5	100
JCT-2196	JUNCTION	324.00	10.2	100
JCT-2198	JUNCTION	288.22	16.3	100
JCT-2199	JUNCTION	288.83	15.7	100
JCT-22_GP	JUNCTION	318.77	10.1	947,383
JCT-220	JUNCTION	327.98	10.0	100
JCT-2200	JUNCTION	292.65	14.1	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2201	JUNCTION	285.50	16.5	100
JCT-2202	JUNCTION	287.05	14.6	100
JCT-2203	JUNCTION	294.57	9.3	100
JCT-2204	JUNCTION	293.20	11.7	204,720
JCT-2205	JUNCTION	292.70	11.9	100
JCT-2206	JUNCTION	291.73	13.5	100
JCT-2207	JUNCTION	296.22	10.0	100
JCT-2208	JUNCTION	292.92	12.3	100
JCT-2209	JUNCTION	293.04	11.8	65,270
JCT-2210	JUNCTION	296.98	7.8	24,647
JCT-2211_GP	JUNCTION	288.60	10.4	600
JCT-2212	JUNCTION	329.00	4.6	100
JCT-2213	JUNCTION	328.00	5.7	100
JCT-2214	JUNCTION	323.61	10.0	100
JCT-2215	JUNCTION	323.46	9.3	100
JCT-2216_GP	JUNCTION	332.18	7.1	100
JCT-2217_GP	JUNCTION	323.00	16.9	100
JCT-2218	JUNCTION	298.24	5.0	100
JCT-2219	JUNCTION	308.95	9.1	100
JCT-222	JUNCTION	330.10	5.9	309,741
JCT-2221_GP	JUNCTION	307.26	15.6	100
JCT-2222_GP	JUNCTION	306.82	14.2	100
JCT-2223_GP	JUNCTION	306.44	14.0	100
JCT-2224_GP	JUNCTION	306.07	13.7	1,000
JCT-2225_1S	JUNCTION	305.70	14.6	100
JCT-2226_GP	JUNCTION	305.25	14.0	514,142
JCT-2227_GP	JUNCTION	304.83	15.3	100
JCT-2228	JUNCTION	300.00	0.7	-
JCT-2229	JUNCTION	301.00	0.7	-
JCT-2230	JUNCTION	305.75	0.7	-
JCT-2231_GP	JUNCTION	319.94	10.0	43,415
JCT-2233_GP	JUNCTION	319.44	9.4	100
JCT-2234_GP	JUNCTION	317.82	11.2	100
JCT-2235	JUNCTION	297.42	8.2	100
JCT-2236	JUNCTION	285.87	12.3	381,540
JCT-2237	JUNCTION	282.74	15.1	100
JCT-2239	JUNCTION	280.49	23.5	100
JCT-224	JUNCTION	328.80	7.2	309,741
JCT-2240	JUNCTION	306.25	1.2	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2241	JUNCTION	342.36	7.6	129,839
JCT-2243	JUNCTION	345.00	0.5	100
JCT-2244	JUNCTION	344.97	0.5	100
JCT-2245	JUNCTION	344.53	0.5	100
JCT-2246	JUNCTION	344.50	0.5	100
JCT-2247	JUNCTION	344.00	4.2	100
JCT-2248	JUNCTION	340.06	3.6	100
JCT-2251	JUNCTION	316.29	12.7	100
JCT-2252	JUNCTION	315.71	12.7	100
JCT-2254	JUNCTION	315.60	12.4	100
JCT-2255	JUNCTION	321.01	7.0	100
JCT-2256	JUNCTION	317.61	12.0	100
JCT-2257	JUNCTION	325.47	4.5	133,741
JCT-2258	JUNCTION	318.00	11.4	1,242,344
JCT-2259	JUNCTION	317.23	12.7	100
JCT-2261	JUNCTION	330.69	5.3	100
JCT-2262	JUNCTION	330.19	4.7	134,239
JCT-2263	JUNCTION	330.00	5.0	100
JCT-2264	JUNCTION	329.24	7.6	336,421
JCT-2265	JUNCTION	316.09	18.4	100
JCT-2267	JUNCTION	328.92	6.2	74,905
JCT-2268	JUNCTION	327.30	6.4	149,543
JCT-2269	JUNCTION	326.82	7.2	100
JCT-2270	JUNCTION	326.24	7.8	130,531
JCT-2271	JUNCTION	325.26	7.9	100
JCT-2272	JUNCTION	329.44	5.6	254,493
JCT-2273	JUNCTION	328.46	7.1	96,594
JCT-2274	JUNCTION	333.70	4.0	100
JCT-2275	JUNCTION	276.63	13.3	100
JCT-2276	JUNCTION	277.98	11.2	100
JCT-2277	JUNCTION	279.37	9.8	501,432
JCT-228	JUNCTION	329.37	4.6	100
JCT-2280	JUNCTION	326.50	1.3	100
JCT-2281	JUNCTION	325.00	1.3	100
JCT-2282	JUNCTION	300.38	9.6	100
JCT-2283	JUNCTION	324.00	1.3	100
JCT-2284_GP	JUNCTION	323.68	7.8	100
JCT-2285_GP	JUNCTION	324.55	6.5	134,562
JCT-2286_GP	JUNCTION	325.02	5.0	121,442

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-2287_GP	JUNCTION	318.56	10.7	100
JCT-2288	JUNCTION	322.64	6.4	1,000
JCT-2289	JUNCTION	321.47	14.3	64,500
JCT-2290	JUNCTION	320.94	14.1	100
JCT-2291	JUNCTION	323.43	11.6	514,551
JCT-2292	JUNCTION	322.90	15.1	100
JCT-2293	JUNCTION	319.93	15.1	42,485
JCT-2294	JUNCTION	319.28	15.7	103,946
JCT-2295	JUNCTION	288.40	14.6	100
JCT-2296	JUNCTION	290.90	16.3	100
JCT-2297	JUNCTION	290.90	16.3	100
JCT-2298	JUNCTION	304.25	10.0	78,038
JCT-232	JUNCTION	334.25	5.8	287,077
JCT-234	JUNCTION	334.77	5.2	115,949
JCT-236	JUNCTION	335.33	7.0	100
JCT-238	JUNCTION	336.33	5.7	86,627
JCT-24_GP	JUNCTION	322.00	6.0	475,894
JCT-240_GP	JUNCTION	334.91	13.1	100
JCT-242_GP	JUNCTION	335.25	12.8	100
JCT-244_GP	JUNCTION	335.58	12.4	867,751
JCT-248	JUNCTION	330.47	19.8	100
JCT-250	JUNCTION	332.01	16.5	100
JCT-254	JUNCTION	334.25	7.8	100
JCT-256	JUNCTION	336.65	7.4	383,870
JCT-258	JUNCTION	338.12	5.9	84,934
JCT-26_GP	JUNCTION	320.80	8.0	310,025
JCT-260	JUNCTION	339.00	5.0	298,652
JCT-270	JUNCTION	339.25	4.8	152,630
JCT-272	JUNCTION	338.00	4.0	119,466
JCT-274	JUNCTION	337.25	4.8	71,163
JCT-276	JUNCTION	336.80	5.2	97,712
JCT-278	JUNCTION	335.63	6.4	491,944
JCT-280	JUNCTION	333.80	6.2	194,820
JCT-284	JUNCTION	327.98	10.0	216,422
JCT-286	JUNCTION	329.00	7.0	11,950
JCT-290	JUNCTION	326.48	10.5	100
JCT-298	JUNCTION	331.10	2.9	406,725
JCT-30_GP	JUNCTION	317.40	11.4	137,145
JCT-3000_GP	JUNCTION	330.87	7.9	1,359,409

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-3001_GP	JUNCTION	327.80	11.5	100
JCT-3002_GP	JUNCTION	328.95	8.1	1,050,012
JCT-3003_GP	JUNCTION	327.66	11.7	100
JCT-3004_GP	JUNCTION	330.89	7.1	699,419
JCT-3005_GP	JUNCTION	321.10	14.8	570,313
JCT-3006_GP	JUNCTION	319.87	14.4	276,210
JCT-3007_GP	JUNCTION	318.44	16.2	778,068
JCT-3008_GP	JUNCTION	317.76	15.1	100
JCT-3010_GP	JUNCTION	322.39	6.8	771,816
JCT-3011_GP	JUNCTION	320.99	6.9	1,268,275
JCT-3012_GP	JUNCTION	314.00	12.2	100
JCT-3013_GP	JUNCTION	316.94	9.3	681,348
JCT-3014_GP	JUNCTION	325.25	7.6	589,465
JCT-3015_GP	JUNCTION	324.71	7.1	100
JCT-3016_GP	JUNCTION	323.56	7.3	956,174
JCT-3018_GP	JUNCTION	322.93	5.9	1,503,079
JCT-3019_GP	JUNCTION	310.69	16.0	747,690
JCT-302_GP	JUNCTION	327.81	5.9	100
JCT-3020_GP	JUNCTION	309.07	15.9	1,443,187
JCT-3021_GP	JUNCTION	308.01	16.2	100
JCT-3022_GP	JUNCTION	311.96	7.9	499,424
JCT-3023_GP	JUNCTION	309.95	7.6	1,277,805
JCT-3024_GP	JUNCTION	311.97	7.5	644,364
JCT-3025_GP	JUNCTION	309.25	7.0	186,845
JCT-3026_GP	JUNCTION	305.99	7.0	436,786
JCT-3027_GP	JUNCTION	305.43	8.3	162,095
JCT-3028_GP	JUNCTION	304.70	8.0	454,034
JCT-3029_GP	JUNCTION	303.58	7.9	379,151
JCT-3030_GP	JUNCTION	302.87	7.3	397,502
JCT-3031_GP	JUNCTION	301.94	7.7	383,083
JCT-3032_GP	JUNCTION	300.63	7.4	261,260
JCT-3033_GP	JUNCTION	298.02	11.0	860,411
JCT-3034_GP	JUNCTION	296.08	12.0	472,240
JCT-3035_GP	JUNCTION	295.09	11.7	100
JCT-3036_GP	JUNCTION	301.25	5.0	455,044
JCT-3037_GP	JUNCTION	292.55	12.0	871,178
JCT-3038_GP	JUNCTION	289.98	11.7	1,275,183
JCT-3039_GP	JUNCTION	288.61	12.0	858,517
JCT-3040_GP	JUNCTION	286.49	12.3	127,847

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-3041_GP	JUNCTION	286.09	12.2	729,308
JCT-3042_GP	JUNCTION	293.00	8.0	833,362
JCT-3044_GP	JUNCTION	298.45	7.0	382,844
JCT-3045_GP	JUNCTION	290.54	9.0	833,019
JCT-3047_GP	JUNCTION	289.67	10.6	836,119
JCT-3048_GP	JUNCTION	290.88	8.5	798,272
JCT-3049_GP	JUNCTION	283.53	13.8	100
JCT-3050_GP	JUNCTION	283.92	12.7	217,347
JCT-3051_GP	JUNCTION	284.29	11.8	100
JCT-3052_GP	JUNCTION	284.96	11.0	531,196
JCT-3053_GP	JUNCTION	309.79	5.1	239,871
JCT-3054_GP	JUNCTION	308.42	4.1	373,502
JCT-3055_GP	JUNCTION	307.43	5.0	360,144
JCT-3056_GP	JUNCTION	309.20	5.6	11,334
JCT-3057_GP	JUNCTION	279.37	16.2	1,305,831
JCT-3058_GP	JUNCTION	280.70	15.7	823,749
JCT-3059_GP	JUNCTION	285.85	11.3	1,808,449
JCT-3060_GP	JUNCTION	284.58	12.8	2,570,673
JCT-3061_GP	JUNCTION	287.54	6.9	422,231
JCT-3062_GP	JUNCTION	286.87	6.3	57,375
JCT-3063_GP	JUNCTION	287.09	6.2	316,075
JCT-3064_GP	JUNCTION	289.88	4.1	1,031,598
JCT-3065_GP	JUNCTION	288.66	6.3	834,767
JCT-3066_GP	JUNCTION	282.70	13.1	139,260
JCT-3067_GP	JUNCTION	289.95	9.1	824,030
JCT-3068_GP	JUNCTION	290.68	8.3	366,584
JCT-3069_GP	JUNCTION	291.89	8.1	410,538
JCT-3070_GP	JUNCTION	297.08	5.0	100
JCT-3071_GP	JUNCTION	290.90	12.9	343,374
JCT-3072_GP	JUNCTION	290.28	13.9	588,103
JCT-3073_GP	JUNCTION	290.69	8.2	215,613
JCT-3074_GP	JUNCTION	289.01	9.5	100
JCT-3075_GP	JUNCTION	288.26	11.5	100
JCT-3075_KWF_GP	JUNCTION	287.60	12.5	100
JCT-3076_GP	JUNCTION	286.89	13.5	100
JCT-3077_GP	JUNCTION	289.20	7.1	1,091,948
JCT-3078_GP	JUNCTION	287.00	8.2	629,498
JCT-3079_GP	JUNCTION	284.82	5.0	282,051
JCT-308	JUNCTION	324.38	10.6	51,797

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-3080_GP	JUNCTION	283.96	10.0	265,280
JCT-3081_GP	JUNCTION	282.75	8.5	139,174
JCT-3082_GP	JUNCTION	281.56	7.0	100
JCT-3083_GP	JUNCTION	280.56	9.0	100
JCT-3084_GP	JUNCTION	293.60	4.0	283,358
JCT-3085_GP	JUNCTION	292.68	5.0	124,799
JCT-3086_GP	JUNCTION	291.50	10.0	100
JCT-3087_GP	JUNCTION	288.21	6.5	263,974
JCT-3088_GP	JUNCTION	291.88	6.0	244,807
JCT-3089_GP	JUNCTION	300.59	13.1	991,545
JCT-3090_GP	JUNCTION	297.82	14.2	1,104,942
JCT-3092_GP	JUNCTION	298.00	15.0	1,073,004
JCT-3093_GP	JUNCTION	296.69	17.7	1,488,119
JCT-3094_GP	JUNCTION	301.00	10.0	612,551
JCT-3096_GP	JUNCTION	295.72	12.1	2,939,670
JCT-3097_GP	JUNCTION	306.75	8.8	100
JCT-3098_GP	JUNCTION	307.38	8.3	1,642,193
JCT-3099_GP	JUNCTION	310.75	7.3	624,951
JCT-310	JUNCTION	324.30	11.0	70,119
JCT-3100_GP	JUNCTION	315.92	7.1	319,748
JCT-3101_GP	JUNCTION	344.15	8.1	1,123,190
JCT-3102_GP	JUNCTION	328.66	6.0	236,157
JCT-3103_GP	JUNCTION	328.07	10.2	383,364
JCT-3104_GP	JUNCTION	327.56	10.2	503,919
JCT-3105_GP	JUNCTION	325.91	9.6	100
JCT-3106_GP	JUNCTION	325.93	5.0	20,081
JCT-3107_GP	JUNCTION	325.57	5.0	52,751
JCT-3108_GP	JUNCTION	325.83	4.0	100
JCT-3109_GP	JUNCTION	324.66	4.0	100
JCT-3110_GP	JUNCTION	324.30	4.0	100
JCT-3111_GP	JUNCTION	324.54	4.0	100
JCT-3112_GP	JUNCTION	324.81	4.0	100
JCT-3113_GP	JUNCTION	323.99	4.0	100
JCT-3114_GP	JUNCTION	323.70	4.0	100
JCT-3115_GP	JUNCTION	322.95	4.0	100
JCT-3116_GP	JUNCTION	335.00	0.5	-
JCT-3117_GP	JUNCTION	342.42	0.5	-
JCT-3118_GP	JUNCTION	325.52	10.5	456,635
JCT-3119_GP	JUNCTION	324.40	9.1	663,735

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-312	JUNCTION	324.18	11.6	82,876
JCT-3120_GP	JUNCTION	327.19	7.8	399,354
JCT-3121_GP	JUNCTION	326.80	11.6	329,061
JCT-3122_GP	JUNCTION	306.56	13.4	46,200
JCT-3123_GP	JUNCTION	308.66	11.3	1,354,259
JCT-314	JUNCTION	323.82	11.8	443,359
JCT-316	JUNCTION	324.97	12.6	457,765
JCT-34_GP	JUNCTION	320.00	4.0	100
JCT-346	JUNCTION	299.00	5.5	393,952
JCT-348	JUNCTION	300.61	5.0	232,603
JCT-350	JUNCTION	299.84	6.8	66,482
JCT-352	JUNCTION	299.67	7.3	29,847
JCT-354	JUNCTION	300.09	6.8	49,912
JCT-356	JUNCTION	298.81	8.8	86,670
JCT-358	JUNCTION	299.72	7.2	429,080
JCT-36	JUNCTION	329.97	16.0	100
JCT-360	JUNCTION	298.24	10.3	674,564
JCT-362	JUNCTION	297.89	12.0	100
JCT-364	JUNCTION	299.31	10.5	306,720
JCT-366	JUNCTION	297.64	13.2	100
JCT-370	JUNCTION	299.18	6.3	100
JCT-372	JUNCTION	297.59	8.4	133,562
JCT-374	JUNCTION	296.99	11.0	100
JCT-38	JUNCTION	328.99	17.0	100
JCT-382	JUNCTION	303.06	8.3	1,057,760
JCT-384	JUNCTION	301.50	9.5	295,910
JCT-388	JUNCTION	301.25	9.8	100
JCT-390	JUNCTION	300.89	7.5	287,753
JCT-392	JUNCTION	300.60	8.8	100
JCT-394	JUNCTION	302.66	12.0	1,158,469
JCT-396	JUNCTION	300.44	11.0	124,529
JCT-398	JUNCTION	301.20	11.0	48,354
JCT-40	JUNCTION	330.61	15.4	100
JCT-400	JUNCTION	303.00	9.0	278,009
JCT-406	JUNCTION	314.77	6.2	205,124
JCT-408	JUNCTION	312.42	9.6	493,193
JCT-410	JUNCTION	316.05	5.0	2,861,721
JCT-42	JUNCTION	332.00	14.0	815,868
JCT-436_GP	JUNCTION	290.83	8.2	925,371

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-438_GP	JUNCTION	291.58	7.4	448,114
JCT-44	JUNCTION	333.21	12.8	321,638
JCT-440_GP	JUNCTION	287.00	13.0	100
JCT-442	JUNCTION	304.80	4.1	100
JCT-446	JUNCTION	303.01	5.7	100
JCT-448	JUNCTION	300.60	9.4	100
JCT-450	JUNCTION	300.60	9.4	100
JCT-454	JUNCTION	300.17	11.3	100
JCT-456	JUNCTION	310.40	7.6	500,378
JCT-46	JUNCTION	335.21	9.8	368,733
JCT-460_GP	JUNCTION	299.00	13.0	697,066
JCT-462_GP	JUNCTION	298.19	13.8	100
JCT-464_GP	JUNCTION	296.58	15.4	100
JCT-466_GP	JUNCTION	297.30	16.7	100
JCT-468_GP	JUNCTION	301.44	12.6	356,234
JCT-470_GP	JUNCTION	299.13	14.9	240,183
JCT-472_GP	JUNCTION	300.00	14.0	209,930
JCT-474_GP	JUNCTION	300.44	13.6	282,146
JCT-476_GP	JUNCTION	302.12	13.9	799,515
JCT-478	JUNCTION	320.95	7.5	100
JCT-48_GP	JUNCTION	302.00	16.0	411,001
JCT-486	JUNCTION	318.85	5.2	100
JCT-490	JUNCTION	316.80	7.2	100
JCT-50_GP	JUNCTION	301.26	16.7	100
JCT-516	JUNCTION	325.47	4.5	100
JCT-52_GP	JUNCTION	298.60	19.4	53,103
JCT-54_GP	JUNCTION	299.36	18.6	100
JCT-56_GP	JUNCTION	299.77	18.2	714,283
JCT-58_GP	JUNCTION	301.33	18.7	305,865
JCT-590	JUNCTION	308.00	14.0	10,000
JCT-594	JUNCTION	277.50	4.5	100
JCT-60_GP	JUNCTION	305.63	10.0	161,563
JCT-618	JUNCTION	312.74	11.3	100
JCT-62_GP	JUNCTION	302.76	12.0	225,765
JCT-620	JUNCTION	311.90	12.1	100
JCT-634	JUNCTION	322.19	13.0	100
JCT-64_GP	JUNCTION	302.39	15.0	100
JCT-656	JUNCTION	327.82	11.5	563,291
JCT-658	JUNCTION	332.54	9.0	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-66_GP	JUNCTION	298.40	19.5	100
JCT-662	JUNCTION	326.25	3.8	293,369
JCT-664	JUNCTION	326.31	3.7	100
JCT-666	JUNCTION	327.16	2.0	309,479
JCT-670	JUNCTION	321.06	7.3	10
JCT-676	JUNCTION	321.00	9.0	100
JCT-68_GP	JUNCTION	298.90	19.0	100
JCT-682	JUNCTION	291.98	8.0	255,584
JCT-684	JUNCTION	291.71	8.3	276,912
JCT-686	JUNCTION	290.91	10.1	59,782
JCT-690	JUNCTION	295.97	6.0	205,427
JCT-692	JUNCTION	295.45	6.6	74,179
JCT-694	JUNCTION	294.52	7.0	71,880
JCT-696	JUNCTION	293.65	6.4	225,573
JCT-698	JUNCTION	293.29	6.7	74,348
JCT-70_GP	JUNCTION	309.66	9.0	100
JCT-700	JUNCTION	293.12	6.9	100
JCT-702	JUNCTION	291.89	8.1	100
JCT-704	JUNCTION	293.87	6.1	455,828
JCT-706	JUNCTION	294.56	5.4	209,327
JCT-708	JUNCTION	295.51	4.5	147,367
JCT-710	JUNCTION	296.19	3.8	152,280
JCT-712	JUNCTION	296.64	3.4	36,323
JCT-718	JUNCTION	285.72	14.3	100
JCT-72_GP	JUNCTION	310.13	8.0	353,687
JCT-720	JUNCTION	286.28	13.7	100
JCT-722	JUNCTION	287.42	12.6	445,590
JCT-724	JUNCTION	287.88	12.1	154,955
JCT-726	JUNCTION	289.50	10.5	154,955
JCT-728	JUNCTION	290.46	9.5	523,862
JCT-730	JUNCTION	292.13	15.5	43,868
JCT-738	JUNCTION	293.26	11.7	100
JCT-74_GP	JUNCTION	306.00	12.0	121,538
JCT-740	JUNCTION	293.70	10.6	489,604
JCT-742	JUNCTION	294.18	10.3	66,321
JCT-750	JUNCTION	276.00	28.0	100
JCT-752	JUNCTION	289.36	16.4	100
JCT-76_GP	JUNCTION	300.27	19.7	179,182
JCT-760	JUNCTION	280.50	25.5	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-762	JUNCTION	283.02	25.0	100
JCT-764	JUNCTION	284.79	21.2	197,173
JCT-766	JUNCTION	286.22	19.8	293,219
JCT-768	JUNCTION	287.25	16.8	131,082
JCT-770	JUNCTION	287.60	16.4	192,002
JCT-772	JUNCTION	284.22	23.8	100
JCT-776	JUNCTION	303.43	6.5	56,555
JCT-778	JUNCTION	299.50	6.5	130,105
JCT-78_GP	JUNCTION	304.00	14.0	283,850
JCT-780	JUNCTION	300.20	5.8	468,945
JCT-782	JUNCTION	300.80	5.2	815,385
JCT-790_GP	JUNCTION	327.11	16.9	302,349
JCT-792_GP	JUNCTION	327.93	16.3	166,414
JCT-794_GP	JUNCTION	329.53	14.5	388,097
JCT-796_GP	JUNCTION	339.63	4.4	384,634
JCT-798_GP	JUNCTION	329.97	14.0	210,617
JCT-80_GP	JUNCTION	302.66	17.3	300,636
JCT-800_GP	JUNCTION	331.84	10.2	311,666
JCT-802_GP	JUNCTION	332.98	11.0	435,907
JCT-804_GP	JUNCTION	333.59	9.4	45,320
JCT-806_GP	JUNCTION	334.04	9.0	479,402
JCT-808_GP	JUNCTION	330.69	13.3	180,744
JCT-810_GP	JUNCTION	331.47	12.5	251,141
JCT-812_GP	JUNCTION	332.11	11.9	1,213,071
JCT-814_GP	JUNCTION	333.51	10.5	246,414
JCT-82_GP	JUNCTION	304.14	15.9	1,009,148
JCT-820	JUNCTION	329.87	6.1	676,864
JCT-822	JUNCTION	337.96	3.6	603,939
JCT-824	JUNCTION	335.24	2.8	391,210
JCT-826	JUNCTION	336.28	2.0	271,964
JCT-828	JUNCTION	334.96	3.0	100
JCT-830	JUNCTION	331.40	6.6	472,065
JCT-832	JUNCTION	330.41	7.6	100
JCT-84_GP	JUNCTION	312.00	12.0	100
JCT-846	JUNCTION	324.57	11.4	100
JCT-848	JUNCTION	324.88	9.1	212,602
JCT-850	JUNCTION	325.95	8.1	79,910
JCT-854	JUNCTION	327.75	6.3	28,574
JCT-856	JUNCTION	329.13	2.9	128,522

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-858	JUNCTION	328.30	5.7	303,923
JCT-860	JUNCTION	328.64	5.4	100
JCT-862	JUNCTION	327.58	7.4	259,090
JCT-864	JUNCTION	335.00	2.0	35,063
JCT-866	JUNCTION	331.00	3.0	218,691
JCT-868	JUNCTION	325.95	6.1	100,963
JCT-870	JUNCTION	324.24	9.8	606,166
JCT-874	JUNCTION	323.55	12.5	46,785
JCT-88_GP	JUNCTION	312.32	16.2	323,978
JCT-880	JUNCTION	324.15	9.9	100
JCT-882	JUNCTION	324.00	6.0	100
JCT-884	JUNCTION	323.04	8.8	100
JCT-886	JUNCTION	323.30	8.9	100
JCT-888	JUNCTION	323.43	10.2	100
JCT-890	JUNCTION	328.67	5.5	161,094
JCT-894	JUNCTION	323.35	10.7	149,124
JCT-896	JUNCTION	323.70	10.3	181,295
JCT-898	JUNCTION	325.25	8.8	177,455
JCT-900	JUNCTION	326.80	7.2	199,152
JCT-902	JUNCTION	326.05	10.0	270,399
JCT-910	JUNCTION	290.90	16.3	100
JCT-912	JUNCTION	291.99	14.0	100
JCT-914	JUNCTION	291.84	13.3	100
JCT-916	JUNCTION	299.04	4.4	72,284
JCT-918	JUNCTION	291.71	10.0	194,056
JCT-920	JUNCTION	294.78	10.6	100
JCT-922	JUNCTION	295.59	9.1	100
JCT-924	JUNCTION	296.03	9.6	82,055
JCT-926	JUNCTION	297.27	8.0	29,477
JCT-928	JUNCTION	297.51	7.0	233,491
JCT-930	JUNCTION	288.40	14.6	100
JCT-932	JUNCTION	301.50	6.5	100
JCT-934	JUNCTION	296.54	11.5	824,229
JCT-936	JUNCTION	301.60	6.4	100
JCT-938	JUNCTION	302.45	2.5	100,732
JCT-940	JUNCTION	301.40	3.5	100
JCT-942	JUNCTION	298.69	5.2	507,409
JCT-944	JUNCTION	298.02	8.0	76,486
JCT-946	JUNCTION	293.54	12.5	340,049

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-946t	JUNCTION	291.53	14.5	100
JCT-948	JUNCTION	294.17	10.8	133,051
JCT-950	JUNCTION	295.98	8.0	82,025
JCT-952	JUNCTION	296.90	7.1	319,320
JCT-954	JUNCTION	297.80	6.2	573,373
JCT-956	JUNCTION	296.71	7.3	116,352
JCT-958	JUNCTION	295.42	10.6	41,567
JCT-96_GP	JUNCTION	308.00	12.0	417,522
JCT-960	JUNCTION	296.33	9.7	934,728
JCT-964	JUNCTION	299.67	8.3	377,746
JCT-968	JUNCTION	303.32	5.5	234,401
JCT-970	JUNCTION	303.25	5.8	30,981
JCT-972	JUNCTION	301.25	5.4	100
JCT-974	JUNCTION	301.70	5.4	100
JCT-976	JUNCTION	282.93	21.1	100
JCT-978	JUNCTION	285.78	16.2	248,714
JCT-98	JUNCTION	306.98	13.0	337,009
JCT-980	JUNCTION	291.73	12.3	814,361
JCT-982	JUNCTION	287.40	14.6	148,189
JCT-984	JUNCTION	287.40	14.6	100
JCT-986	JUNCTION	288.30	13.7	449,907
JCT-988	JUNCTION	302.02	4.2	1,000
JCT-990	JUNCTION	302.66	11.3	101,180
JCT-992	JUNCTION	304.09	9.9	266,765
JCT-994	JUNCTION	306.72	11.3	210,059
JCT-996	JUNCTION	308.65	9.4	361,792
JCT-998	JUNCTION	310.00	8.0	337,892
JCT-A280_1	JUNCTION	287.22	8.8	100
JCT-A280_2	JUNCTION	289.78	10.6	100
JCT-A280_3	JUNCTION	290.54	11.1	100
JCT-A280_4	JUNCTION	294.28	6.6	206,380
JCT-A280_5	JUNCTION	296.48	6.9	359,343
JCT-Burke_GP	JUNCTION	313.54	15.9	100
JCT-Burke_1_GP	JUNCTION	324.58	6.7	87,919
JCT-Burke_2_GP	JUNCTION	322.38	8.7	200,827
JCT-Burke_3_GP	JUNCTION	324.16	5.1	176,970
JCT-Burke_4_GP	JUNCTION	319.58	11.0	247,257
JCT-CameronCreek_N	JUNCTION	323.18	17.0	893,025
JCT-GD1	JUNCTION	254.00	29.0	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JCT-WG1	JUNCTION	297.63	8.0	100
JG-1	JUNCTION	315.00	9.0	1,021,200
JG-10	JUNCTION	313.73	12.3	536,975
JG-11	JUNCTION	307.89	12.6	583,342
JG-13	JUNCTION	299.82	12.7	1,912,668
JG-14	JUNCTION	295.47	14.5	744,627
JG-16	JUNCTION	302.50	7.5	88,145
JG-17	JUNCTION	296.00	10.0	175,693
JG-2	JUNCTION	310.15	13.9	547,959
JCA-1_GP	JUNCTION	285.00	16.0	837,888
JCA-2_GP	JUNCTION	286.00	15.0	847,355
JCA-3_GP	JUNCTION	287.50	13.0	1,648,737
JCA-4_GP	JUNCTION	293.00	12.0	447,345
JCA-5_GP	JUNCTION	290.00	15.0	1,738,715
JCA-6_GP	JUNCTION	300.00	8.0	1,225,309
islandOaks1_GP	JUNCTION	330.03	4.0	100
OFALL-220_GP	JUNCTION	314.50	5.5	-
JMD-1_GP	JUNCTION	312.50	8.8	100
JMD-2_GP	JUNCTION	312.50	8.8	100
modoc_GP	JUNCTION	325.50	6.5	100
JMD-3_GP	JUNCTION	327.67	6.0	100
JMD-4_GP	JUNCTION	327.67	6.0	100
JMD-5_GP	JUNCTION	325.60	5.3	100
JMD-6_GP	JUNCTION	325.50	5.3	100
OFALL-230_GP	JUNCTION	325.00	0.0	-
JMD-7_GP	JUNCTION	325.50	5.0	100
JMD-8_GP	JUNCTION	325.50	5.0	100
JMD-9_GP	JUNCTION	325.40	5.0	100
JMD-10_GP	JUNCTION	325.40	5.0	100
OFALL-212_GP	JUNCTION	322.63	0.0	-
OFALL-214_GP	JUNCTION	321.22	5.0	-
JMD-12_GP	JUNCTION	321.15	5.0	100
OFALL-2019_GP	JUNCTION	321.00	0.0	-
OFALL-216_GP	JUNCTION	321.00	0.0	-
OFALL-2051_GP	JUNCTION	319.46	5.0	-
JMD-13_GP	JUNCTION	319.46	0.0	100
JMD-14_GP	JUNCTION	317.30	8.5	100
JMD-15_GP	JUNCTION	317.30	6.7	100
JMD-16_GP	JUNCTION	313.90	10.1	100

Table G-1. Future Conditions Model Junctions and Dividers

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)	Ponded Area (sq ft)
JMD-17_GP	JUNCTION	313.90	10.1	100
JMD-18_GP	JUNCTION	313.68	9.0	100
JMD-19_GP	JUNCTION	313.68	9.0	100
JMD-20_GP	JUNCTION	312.83	8.2	100
JMD-21_GP	JUNCTION	312.83	7.4	100
MD-temp_GP	JUNCTION	311.00	7.0	100
JOFALL-68	JUNCTION	301.07	7.0	100
JCTN-23	JUNCTION	300.92	7.5	100
JCTN-24	JUNCTION	326.60	11.0	100
DIV-66	JUNCTION	302.90	4.7	100
JCTN-25	JUNCTION	303.50	5.7	1,267,765
JCTN-26	JUNCTION	292.42	14.9	100
JCTN-27	JUNCTION	297.48	11.0	100
JCT-BEECH	JUNCTION	309.00	10.0	100
JCTN-28	JUNCTION	337.38	8.5	100
JCTN-29	JUNCTION	339.86	3.9	380,065
JCTN-30_GP	JUNCTION	314.50	5.0	882,221
JG-ShirkW	JUNCTION	281.75	18.1	100
JCTN-32_GP	JUNCTION	290.40	11.0	426,477
JCT-159_GP	JUNCTION	329.20	8.8	1,126,685
DIV-10	DIVIDER	318.90	5.1	100
DIV-12	DIVIDER	316.76	1.0	-
DIV-14	DIVIDER	329.00	1.8	1,204,842
DIV-16	DIVIDER	326.93	2.0	100
DIV-34_GP	DIVIDER	317.00	11.7	470,315
DIV-36	DIVIDER	322.00	1.5	848,400
DIV-42	DIVIDER	329.69	7.0	100
DIV-50	DIVIDER	328.80	2.5	100
DIV-52	DIVIDER	328.01	5.7	-
DIV-54	DIVIDER	299.09	6.0	204,156
DIV-60	DIVIDER	308.59	2.5	204,156
DIV-64	DIVIDER	317.27	0.0	-

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-FCIP1N	CIRCULAR	295.72	294.00	1,716	5
2_GP	CIRCULAR	313.54	313.20	139	4.5
burkeOverflow_GP	HORIZ_ELLIPSE	325.26	325.16	53	2.417
CDT-1001	CIRCULAR	286.28	285.72	274	3
CDT-1003	CIRCULAR	287.88	287.03	798	2.25
CDT-1005	CIRCULAR	289.50	288.13	806	2
CDT-1007	CIRCULAR	290.46	289.50	470	2
CDT-1009	CIRCULAR	280.50	278.50	119	3.5
CDT-1011	CIRCULAR	283.02	280.50	1,672	3.5
CDT-1013	CIRCULAR	284.79	284.52	174	2
CDT-1015	CIRCULAR	286.22	284.79	945	2
CDT-1017	CIRCULAR	287.25	286.22	681	2
CDT-1019	CIRCULAR	287.60	287.25	203	2
CDT-1021	CIRCULAR	284.22	283.02	595	3.5
CDT-1023	CIRCULAR	297.85	297.71	133	3
CDT-1025	CIRCULAR	299.50	297.48	1,271	2.25
CDT-1029	CIRCULAR	300.80	300.20	917	2
CDT-1037_GP	CIRCULAR	327.11	325.84	192	3.5
CDT-1039_GP	CIRCULAR	329.97	328.11	597	2.5
CDT-1041_GP	CIRCULAR	331.84	329.97	712	2.5
CDT-1043_GP	CIRCULAR	333.59	332.34	611	2
CDT-1045_GP	CIRCULAR	334.04	333.59	293	2
CDT-1047_GP	CIRCULAR	332.98	332.34	427	2
CDT-1049_GP	CIRCULAR	329.53	328.93	650	2
CDT-1051_GP	CIRCULAR	339.63	328.93	470	2
CDT-1053_GP	CIRCULAR	327.93	327.61	505	3
CDT-1055_GP	CIRCULAR	330.69	326.97	883	3
CDT-1057_GP	CIRCULAR	331.47	330.69	382	3
CDT-1059_GP	CIRCULAR	332.11	331.47	313	3
CDT-1061_GP	CIRCULAR	333.51	333.11	198	2
CDT-1067	CIRCULAR	329.87	329.69	112	2
CDT-1069	CIRCULAR	329.69	330.00	128	2
CDT-1071	CIRCULAR	329.69	329.00	410	2
CDT-1073	CIRCULAR	337.96	335.49	833	2
CDT-1075	CIRCULAR	335.24	333.60	1,312	2.25
CDT-1077	CIRCULAR	336.28	335.21	656	2
CDT-1079	CIRCULAR	334.96	333.60	676	2.25
CDT-1081	CIRCULAR	331.40	330.41	891	2.5
CDT-1083	CIRCULAR	330.41	330.26	483	2.5
CDT-1085	CIRCULAR	327.58	327.00	194	3.5
CDT-1087	CIRCULAR	327.75	327.58	616	3.5
CDT-1089	CIRCULAR	328.30	327.75	413	3.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1091	CIRCULAR	328.64	328.30	223	3.5
CDT-1093	CIRCULAR	328.80	328.75	40	2.5
CDT-1095	CIRCULAR	329.13	328.80	781	2.5
CDT-1097	CIRCULAR	328.80	325.95	735	2.5
CDT-1099	CIRCULAR	325.95	324.88	703	2.5
CDT-1101	CIRCULAR	324.88	324.57	310	2.5
CDT-1107	CIRCULAR	335.00	331.00	1,982	2
CDT-1109	CIRCULAR	331.00	326.95	888	2
CDT-1111	CIRCULAR	325.95	324.24	1,416	3
CDT-1113	CIRCULAR	324.24	324.15	89	3
CDT-1117	CIRCULAR	325.07	324.65	408	2.5
CDT-1121	CIRCULAR	324.15	323.55	593	3
CDT-1129	CIRCULAR	324.00	320.03	260	2
CDT-1135	CIRCULAR	328.67	328.01	1,106	2
CDT-1137	CIRCULAR	328.01	328.00	10	2
CDT-1139	CIRCULAR	328.01	323.81	38	2
CDT-1141	CIRCULAR	323.43	323.61	170	2
CDT-1143	CIRCULAR	323.30	323.04	513	2
CDT-1145	CIRCULAR	323.04	323.00	38	2
CDT-1147	CIRCULAR	323.35	322.00	266	3
CDT-1149	CIRCULAR	323.70	323.35	392	3
CDT-1151	CIRCULAR	325.25	324.20	673	2.5
CDT-1153	CIRCULAR	326.80	325.75	698	2
CDT-1155	CIRCULAR	326.05	324.70	895	2
CDT-1157	CIRCULAR	294.18	293.80	103	2
CDT-1159	CIRCULAR	293.70	293.36	172	2.25
CDT-1167	CIRCULAR	289.36	288.83	533	4.5
CDT-1175	CIRCULAR	291.90	290.90	120	2.5
CDT-1183	CIRCULAR	294.78	291.71	621	3
CDT-1185	CIRCULAR	295.59	295.28	278	2.5
CDT-1187	CIRCULAR	296.03	295.59	556	2.5
CDT-1191	CIRCULAR	297.86	297.52	225	2
CDT-1193	CIRCULAR	291.90	288.50	210	1.5
CDT-1195	CIRCULAR	288.40	287.15	60	2.5
CDT-1197	TRAPEZOIDAL	0.00	0.00	400	1.5
CDT-1199	CIRCULAR	292.13	286.80	99	2.5
CDT-1203	CIRCULAR	300.99	300.74	155	2
CDT-1205	CIRCULAR	302.45	302.40	693	2.5
CDT-1207	CIRCULAR	301.40	300.09	1,436	3.5
CDT-1209	CIRCULAR	299.09	298.69	190	3.5
CDT-1211	CIRCULAR	298.69	298.02	807	3.5
CDT-1215	CIRCULAR	299.09	298.49	58	3.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1217	CIRCULAR	291.53	290.36	1,542	3.5
CDT-1217b	CIRCULAR	293.54	291.53	490	3.5
CDT-1219	CIRCULAR	294.17	293.54	420	3.5
CDT-1221	CIRCULAR	295.98	295.17	528	2.5
CDT-1223	CIRCULAR	296.71	296.48	225	2
CDT-1225	CIRCULAR	296.90	295.98	606	2.5
CDT-1227	CIRCULAR	297.80	296.90	525	2.5
CDT-1229	CIRCULAR	295.42	295.17	800	2.5
CDT-1231	CIRCULAR	296.33	295.67	604	2.25
CDT-1233	CIRCULAR	303.43	302.77	1,286	2.5
CDT-1235	CIRCULAR	303.32	303.25	136	2.5
CDT-1237	CIRCULAR	303.25	302.77	735	2.5
CDT-1239	CIRCULAR	301.77	299.67	1,394	3.5
CDT-1245	CIRCULAR	299.67	299.16	1,282	3.5
CDT-1247	CIRCULAR	299.16	296.42	1,289	3.5
CDT-1257	CIRCULAR	288.30	287.40	587	2
CDT-1259	CIRCULAR	287.40	286.28	738	2
CDT-1261	CIRCULAR	287.40	286.28	737	2
CDT-1263	CIRCULAR	285.78	282.93	1,899	2.5
CDT-1265	CIRCULAR	291.73	283.43	594	2
CDT-1267	CIRCULAR	282.93	280.59	1,182	3
CDT-1275	CIRCULAR	302.66	301.00	433	4
CDT-1277	CIRCULAR	304.09	302.66	946	4
CDT-1279	CIRCULAR	306.25	304.09	1,436	4
CDT-1281	CIRCULAR	306.72	306.25	309	4
CDT-1283	CIRCULAR	308.65	306.72	871	4
CDT-1285	CIRCULAR	310.00	308.65	1,308	4
CDT-1287	CIRCULAR	311.86	310.00	1,239	4
CDT-1289	CIRCULAR	315.93	313.36	2,667	2.5
CDT-1291	CIRCULAR	314.72	313.86	571	2
CDT-1293	CIRCULAR	315.55	314.72	546	2
CDT-1295	CIRCULAR	315.71	315.55	106	2
CDT-1297	CIRCULAR	312.49	309.00	948	2
CDT-1299	CIRCULAR	309.54	308.25	854	2
CDT-1301	CIRCULAR	304.48	305.50	391	1.5
CDT-1303	CIRCULAR	308.48	307.98	451	3
CDT-1305	CIRCULAR	310.00	308.48	933	3
CDT-1307	CIRCULAR	313.70	311.00	316	2
CDT-1309	CIRCULAR	312.89	311.00	796	2
CDT-1315	CIRCULAR	314.47	314.05	279	2
CDT-1317	CIRCULAR	314.72	314.47	167	2
CDT-1319	CIRCULAR	315.35	314.72	616	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1321	CIRCULAR	317.61	316.42	795	2
CDT-1323	CIRCULAR	316.42	315.35	501	2
CDT-1325	CIRCULAR	314.01	313.70	304	2
CDT-1327	CIRCULAR	314.30	314.01	282	2
CDT-1329	CIRCULAR	314.55	314.30	248	2
CDT-1331	CIRCULAR	315.03	314.55	320	2
CDT-1333	CIRCULAR	315.42	315.03	252	2
CDT-1335	CIRCULAR	315.69	315.42	177	2
CDT-1337	CIRCULAR	316.02	315.69	219	2
CDT-1339	CIRCULAR	316.86	316.02	555	2
CDT-1343	CIRCULAR	298.43	297.54	595	2.5
CDT-1345	CIRCULAR	298.86	298.43	282	2.5
CDT-1347	CIRCULAR	299.30	298.86	296	2.5
CDT-1351	CIRCULAR	300.64	299.77	575	2.5
CDT-1353	CIRCULAR	302.04	300.89	600	2.25
CDT-1357	CIRCULAR	302.50	302.29	288	2
CDT-1359	CIRCULAR	304.30	302.50	331	2
CDT-1363	CIRCULAR	303.39	303.00	226	3
CDT-1365	CIRCULAR	304.17	303.39	514	3
CDT-1367	CIRCULAR	304.53	304.42	236	2.25
CDT-1369	CIRCULAR	305.18	304.78	426	2
CDT-1371	CIRCULAR	304.35	304.17	812	3
CDT-1373	CIRCULAR	304.67	304.35	150	2.5
CDT-1375	CIRCULAR	305.54	304.67	688	2.5
CDT-1377	CIRCULAR	305.67	305.54	282	2.5
CDT-1379	CIRCULAR	306.00	305.67	291	3
CDT-1381	CIRCULAR	306.99	306.00	1,159	2.5
CDT-1383	CIRCULAR	307.50	306.99	1,445	2
CDT-1389	CIRCULAR	305.19	299.09	237	2.5
CDT-1391	CIRCULAR	306.55	305.19	329	2.5
CDT-1393	CIRCULAR	309.53	307.05	1,650	2
CDT-1395	CIRCULAR	307.26	299.09	277	3.5
CDT-1397	CIRCULAR	308.96	307.76	1,327	3
CDT-1399	CIRCULAR	309.75	309.46	185	2.5
CDT-1401	CIRCULAR	310.35	309.75	390	2.5
CDT-1403	CIRCULAR	311.46	310.85	408	2
CDT-1405	CIRCULAR	307.57	307.26	193	3.5
CDT-1407	CIRCULAR	308.12	308.07	352	3
CDT-1409	CIRCULAR	308.91	308.62	517	2.5
CDT-1411	CIRCULAR	309.87	309.41	301	2
CDT-1413	CIRCULAR	309.02	308.62	261	2.5
CDT-1415	CIRCULAR	309.99	309.02	636	2.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1417	CIRCULAR	311.36	310.49	573	2
CDT-1419	CIRCULAR	308.59	308.09	327	2.5
CDT-1421	CIRCULAR	308.93	308.59	224	2.5
CDT-1423	CIRCULAR	309.11	308.93	119	2.5
CDT-1425	CIRCULAR	309.88	309.11	505	2.5
CDT-1427	CIRCULAR	310.68	310.38	197	2
CDT-1429	CIRCULAR	310.90	310.34	299	2
CDT-1431	CIRCULAR	309.59	308.00	59	1
CDT-1435	CIRCULAR	310.34	310.00	157	2
CDT-1437	CIRCULAR	310.09	308.00	68	1
CDT-1439_GP	CIRCULAR	312.60	302.00	253	2.5
CDT-1441_GP	CIRCULAR	313.20	312.60	288	2.5
CDT-1443_GP	CIRCULAR	313.90	313.20	496	2.5
CDT-1445_GP	CIRCULAR	314.41	313.90	298	2.5
CDT-1455_GP	CIRCULAR	319.52	318.12	695	3.5
CDT-1457_GP	CIRCULAR	318.85	318.62	547	2
CDT-1459_GP	CIRCULAR	320.78	318.12	1,325	2.5
CDT-1461_GP	CIRCULAR	323.90	321.28	1,076	2
CDT-1463_GP	CIRCULAR	324.62	323.90	324	2
CDT-1465	CIRCULAR	317.86	307.89	482	3.5
CDT-1467	CIRCULAR	318.54	318.36	195	3
CDT-1469	CIRCULAR	319.34	318.54	971	3
CDT-1471	CIRCULAR	319.52	319.34	254	3
CDT-1473	CIRCULAR	320.50	319.52	276	3
CDT-1475	CIRCULAR	321.10	320.02	499	2.5
CDT-1477	CIRCULAR	322.04	321.10	416	2.5
CDT-1479	CIRCULAR	324.50	322.54	1,158	2
CDT-1481	CIRCULAR	325.52	321.50	784	2
CDT-1483	CIRCULAR	323.90	322.25	1,006	2
CDT-1485	CIRCULAR	324.50	323.90	380	2
CDT-1487	CIRCULAR	325.95	324.50	469	2
CDT-1489	CIRCULAR	326.70	325.95	469	2
CDT-1491	CIRCULAR	303.37	300.00	278	3
CDT-1493	CIRCULAR	304.64	304.37	176	2
CDT-1495	CIRCULAR	305.79	304.64	451	2
CDT-1497	CIRCULAR	303.47	303.37	60	3
CDT-1499	CIRCULAR	304.12	303.47	421	3
CDT-1501	CIRCULAR	305.42	305.28	1,137	2
CDT-1503	CIRCULAR	306.16	305.42	476	2
CDT-1505	CIRCULAR	306.76	306.16	389	2
CDT-1507	CIRCULAR	306.50	305.12	913	2
CDT-1509	CIRCULAR	307.70	306.50	778	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1511	CIRCULAR	308.60	307.70	598	2
CDT-1513	CIRCULAR	308.15	306.50	1,091	2
CDT-1517	CIRCULAR	325.95	325.17	350	2.5
CDT-1519	CIRCULAR	327.90	325.45	1,258	2
CDT-152_GP	CIRCULAR	300.44	299.60	164	3.5
CDT-1521	CIRCULAR	326.83	325.45	247	2.5
CDT-1523	CIRCULAR	328.48	326.83	551	2
CDT-1525	CIRCULAR	334.80	333.00	851	2.25
CDT-1527	CIRCULAR	336.35	334.80	636	2
CDT-1529	CIRCULAR	332.22	331.00	604	2
CDT-153_GP	CIRCULAR	307.80	305.89	656	2
CDT-1535_GP	CIRCULAR	313.20	302.00	391	4.5
CDT-154_FCIP8-10	CIRCULAR	307.43	305.09	2,341	3.5
CDT-154_Mooney_GP	CIRCULAR	308.69	299.60	886	2
CDT-1545	CIRCULAR	313.12	312.89	142	2
CDT-1547	CIRCULAR	314.05	313.12	615	2
CDT-155_GP	CIRCULAR	327.95	326.71	1,237	4.5
CDT-1551_GP	CIRCULAR	296.50	292.00	329	3.5
CDT-1553_GP	CIRCULAR	296.95	296.50	285	3.5
CDT-1555_GP	CIRCULAR	299.51	298.45	703	2
CDT-1557_GP	CIRCULAR	298.75	296.95	1,198	3.5
CDT-1559_GP	CIRCULAR	299.60	299.25	564	2.5
CDT-156_GP	CIRCULAR	326.71	320.00	787	4.5
CDT-1561_GP	CIRCULAR	297.42	292.00	701	4.5
CDT-1563_GP	CIRCULAR	297.95	297.42	345	4.5
CDT-1565_GP	CIRCULAR	299.60	298.45	996	3.5
CDT-1567_GP	CIRCULAR	302.90	301.19	577	3.5
CDT-1569_GP	CIRCULAR	301.85	301.60	462	2
CDT-157_GP	CIRCULAR	292.87	292.08	591	1
CDT-1571_GP	CIRCULAR	300.72	300.25	307	2
CDT-1573	CIRCULAR	300.20	299.75	1,053	2
CDT-1575	CIRCULAR	307.41	307.00	271	3.5
CDT-1577	CIRCULAR	307.86	307.41	201	3.5
CDT-1579	CIRCULAR	309.87	307.61	752	4
CDT-1581	CIRCULAR	310.11	309.87	239	3.5
CDT-1583	CIRCULAR	310.12	309.11	1,004	3.5
CDT-1585	CIRCULAR	310.71	310.62	90	3
CDT-1587	CIRCULAR	312.12	311.21	1,153	2.5
CDT-1589	CIRCULAR	314.74	312.62	1,866	2
CDT-159_KWF_GP	CIRCULAR	290.83	292.90	573	1.25
CDT-1591	CIRCULAR	315.46	314.74	716	2
CDT-1593	CIRCULAR	316.77	315.46	1,302	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-1595	CIRCULAR	307.82	307.00	208	2.5
CDT-1597	CIRCULAR	308.26	307.32	939	3
CDT-160_KWF_GP	CIRCULAR	292.90	292.98	80	2.5
CDT-160_New_GP	CIRCULAR	348.20	345.70	2,500	4
CDT-160_Shirk	CIRCULAR	292.50	292.30	586	1
CDT-1601	CIRCULAR	310.70	310.30	388	2
CDT-1603	CIRCULAR	309.91	309.80	109	2.5
CDT-1605	CIRCULAR	309.14	308.26	871	3
CDT-1607	CIRCULAR	309.80	309.64	151	2.5
CDT-161_KWF_GP	CIRCULAR	293.25	293.08	134	2.5
CDT-161_Shirk	CIRCULAR	292.13	290.55	1,383	1.5
CDT-1613	CIRCULAR	304.28	304.12	100	3
CDT-162_KWF_GP	CIRCULAR	293.75	292.62	90	1.5
CDT-1621	CIRCULAR	299.83	299.69	2,712	2.5
CDT-1623	CIRCULAR	301.33	299.83	975	2.5
CDT-1649	CIRCULAR	301.62	300.60	508	2
CDT-1651	CIRCULAR	298.02	297.59	427	3.5
CDT-1657	CIRCULAR	306.00	303.00	1,369	2
CDT-1659	CIRCULAR	280.79	280.00	2,844	2.5
CDT-1661	CIRCULAR	288.38	287.33	1,316	2
CDT-1663	CIRCULAR	287.33	280.00	578	3
CDT-1665	CIRCULAR	300.00	300.07	178	2
CDT-1667	CIRCULAR	300.17	300.07	46	2.5
CDT-1669	CIRCULAR	304.40	302.40	132	3.5
CDT-1671	CIRCULAR	299.77	299.30	313	2.5
CDT-1675	CIRCULAR	280.49	280.25	339	3
CDT-1677	CIRCULAR	301.63	300.25	904	2
CDT-1679	CIRCULAR	299.75	299.66	683	3
CDT-1681	CIRCULAR	310.40	309.80	354	2
CDT-1683	CIRCULAR	316.80	304.67	549	3
CDT-1685	CIRCULAR	317.49	317.27	223	2
CDT-1687	CIRCULAR	317.27	317.05	210	2
CDT-1689	CIRCULAR	317.27	316.97	305	2
CDT-1691	CIRCULAR	317.72	316.97	743	2
CDT-1695	CIRCULAR	304.85	304.80	10	1.75
CDT-1697	CIRCULAR	304.85	301.05	2,637	1.75
CDT-195_GP	CIRCULAR	335.58	334.91	237	2
CDT-197_GP	CIRCULAR	335.25	334.91	123	2
CDT-199_GP	CIRCULAR	334.91	324.72	151	2
CDT-2001	CIRCULAR	299.53	299.50	66	5
CDT-2002	CIRCULAR	299.50	299.27	442	5
CDT-2003	CIRCULAR	299.27	299.00	450	5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2004	CIRCULAR	299.00	298.97	31	5
CDT-2005	CIRCULAR	323.80	323.20	300	4.5
CDT-2006	CIRCULAR	323.20	322.55	325	4.5
CDT-2007	CIRCULAR	322.55	322.13	276	4.5
CDT-2008_GP	CIRCULAR	285.10	284.66	317	4
CDT-2009	CIRCULAR	284.66	283.61	96	4
CDT-2010_GP	CIRCULAR	314.88	314.25	328	4
CDT-2011_GP	CIRCULAR	314.25	313.55	329	4
CDT-2012_GP	CIRCULAR	317.81	317.55	296	4
CDT-2013_GP	CIRCULAR	317.55	317.53	304	4
CDT-2014_GP	CIRCULAR	317.53	317.47	270	4
CDT-2015_GP	CIRCULAR	317.47	313.55	182	4
CDT-2016	CIRCULAR	323.87	323.47	495	4
CDT-2017	CIRCULAR	323.47	323.28	141	4
CDT-2020_GP	CIRCULAR	286.38	285.83	369	3.5
CDT-2021_GP	CIRCULAR	285.83	285.63	135	3.5
CDT-2022_GP	CIRCULAR	285.63	285.42	139	3.5
CDT-2023_GP	CIRCULAR	285.42	285.10	139	3.5
CDT-2024_GP	CIRCULAR	305.68	305.29	189	2.5
CDT-2025_GP	CIRCULAR	305.29	304.67	310	2.5
CDT-2026_GP	CIRCULAR	304.67	303.82	430	3
CDT-2027_GP	CIRCULAR	303.82	303.67	74	3.5
CDT-2028	CIRCULAR	303.67	302.90	389	3.5
CDT-2029_GP	CIRCULAR	315.93	315.49	471	3.5
CDT-2030_GP	CIRCULAR	315.49	315.00	384	3.5
CDT-2031_GP	CIRCULAR	315.00	314.16	168	3.5
CDT-2032	CIRCULAR	308.78	308.40	501	3.5
CDT-2035	CIRCULAR	282.24	282.12	113	3
CDT-2036	CIRCULAR	282.12	281.97	150	3
CDT-2037	CIRCULAR	281.97	281.86	108	3
CDT-2038	CIRCULAR	281.86	281.67	91	3
CDT-2039	CIRCULAR	281.67	281.24	326	3
CDT-2040	CIRCULAR	281.24	280.43	272	3
CDT-2041	CIRCULAR	280.43	279.60	268	3
CDT-2042	CIRCULAR	279.60	279.21	139	3
CDT-2043	CIRCULAR	308.04	307.50	336	2.5
CDT-2044	CIRCULAR	307.50	307.05	279	3
CDT-2045	CIRCULAR	307.05	306.70	222	3
CDT-2046	CIRCULAR	306.70	306.36	208	3
CDT-2047	CIRCULAR	306.36	306.21	93	3
CDT-2049	CIRCULAR	326.75	326.39	263	3
CDT-2050	CIRCULAR	326.39	326.04	248	3

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2051	CIRCULAR	326.04	323.87	165	3
CDT-2052	CIRCULAR	324.90	323.87	20	3
CDT-2053	CIRCULAR	325.17	324.90	344	3
CDT-2054_GP	CIRCULAR	340.64	339.99	476	3
CDT-2055_GP	CIRCULAR	339.99	339.62	333	3
CDT-2056_GP	CIRCULAR	339.52	339.28	240	3.5
CDT-2058_GP	CIRCULAR	308.88	308.80	194	3
CDT-2059_GP	CIRCULAR	308.80	308.16	358	3
CDT-2060_GP	CIRCULAR	308.16	308.00	123	3
CDT-2061_GP	CIRCULAR	308.00	298.60	188	3
CDT-2062	CIRCULAR	309.03	308.78	533	3
CDT-2063	CIRCULAR	306.10	305.10	274	2.5
CDT-2064	CIRCULAR	305.10	303.70	281	3
CDT-2065	CIRCULAR	303.70	301.44	398	3
CDT-2066	CIRCULAR	300.07	298.64	1,255	2.5
CDT-2067	CIRCULAR	298.14	295.98	1,377	3
CDT-2068	CIRCULAR	295.88	290.00	140	3
CDT-2069	CIRCULAR	291.62	291.28	67	3
CDT-2070	CIRCULAR	291.28	289.73	310	3
CDT-2071	CIRCULAR	289.73	289.22	105	3
CDT-2074	CIRCULAR	281.15	280.58	285	2.5
CDT-2075	CIRCULAR	280.58	279.99	455	2.5
CDT-2076	CIRCULAR	279.99	265.29	65	2.5
CDT-2077	CIRCULAR	275.32	276.19	273	2.5
CDT-2078	CIRCULAR	273.65	275.32	455	2.5
CDT-2079	CIRCULAR	274.93	273.65	342	2.5
CDT-2080_GP	CIRCULAR	333.84	332.11	488	2.5
CDT-2082_GP	CIRCULAR	341.49	341.14	261	2.5
CDT-2083_GP	CIRCULAR	341.14	340.88	179	2.5
CDT-2084_GP	CIRCULAR	340.88	340.75	147	2.5
CDT-2085_GP	CIRCULAR	340.75	340.66	102	2.5
CDT-2086_GP	CIRCULAR	340.66	340.64	38	2.5
CDT-2087_GP	CIRCULAR	316.24	315.93	172	2.5
CDT-2088_GP	CIRCULAR	316.71	316.24	426	2.5
CDT-2089_GP	CIRCULAR	317.25	316.49	587	2.5
CDT-2090_GP	CIRCULAR	312.49	312.11	312	2.5
CDT-2091_GP	CIRCULAR	312.11	311.67	381	2.5
CDT-2092_GP	CIRCULAR	311.67	311.21	381	2.5
CDT-2093_GP	CIRCULAR	311.21	310.88	267	2.5
CDT-2094_GP	CIRCULAR	310.88	310.15	236	2.5
CDT-2095_GP	CIRCULAR	312.74	312.21	330	2.5
CDT-2096_GP	CIRCULAR	312.21	311.57	300	2.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2097_GP	CIRCULAR	311.57	311.52	45	2.5
CDT-2098_GP	CIRCULAR	311.52	310.98	328	2.5
CDT-2099_GP	CIRCULAR	310.98	310.57	262	2.5
CDT-2100_GP	CIRCULAR	310.57	310.34	122	2.5
CDT-2101_GP	CIRCULAR	310.34	309.74	300	2.5
CDT-2102	CIRCULAR	309.74	309.47	132	2.5
CDT-2103_GP	CIRCULAR	309.47	308.91	285	2.5
CDT-2104_GP	CIRCULAR	308.91	308.28	311	2.5
CDT-2105_GP	CIRCULAR	308.28	307.99	145	2.5
CDT-2106_GP	CIRCULAR	302.36	301.48	292	2.5
CDT-2107	CIRCULAR	301.48	300.69	315	2.5
CDT-2108_GP	CIRCULAR	300.69	299.92	398	2.5
CDT-2109_GP	CIRCULAR	299.92	299.67	86	2.5
CDT-2110_GP	CIRCULAR	299.67	299.03	298	2.5
CDT-2111_GP	CIRCULAR	299.03	298.50	204	2.5
CDT-2112_GP	CIRCULAR	298.50	297.30	86	2.5
CDT-2113	CIRCULAR	302.08	301.72	360	2.5
CDT-2114	CIRCULAR	301.72	301.36	355	2.5
CDT-2115	CIRCULAR	301.36	301.23	129	2.5
CDT-2116	CIRCULAR	301.23	300.07	718	2.5
CDT-2117	CIRCULAR	292.31	290.31	342	2.5
CDT-2118	CIRCULAR	290.31	290.00	182	2.5
CDT-2119	CIRCULAR	297.02	296.47	342	2.5
CDT-2120	CIRCULAR	296.47	296.29	172	2.5
CDT-2121	CIRCULAR	296.29	295.79	504	2.5
CDT-2122	CIRCULAR	295.79	294.91	679	2.5
CDT-2123	CIRCULAR	294.91	293.51	100	2.5
CDT-2124	CIRCULAR	296.29	292.31	211	2.5
CDT-2125	CIRCULAR	294.84	294.53	322	2.5
CDT-2126	CIRCULAR	294.53	294.20	307	2.5
CDT-2127	CIRCULAR	294.20	293.88	306	2.5
CDT-2128	CIRCULAR	293.88	293.57	309	2.5
CDT-2129	CIRCULAR	293.57	293.14	272	2.5
CDT-2130	CIRCULAR	293.14	292.60	253	2.5
CDT-2131	CIRCULAR	301.46	299.82	465	2.5
CDT-2132	CIRCULAR	309.52	308.78	273	2.5
CDT-2133_GP	CIRCULAR	319.52	317.81	519	3.5
CDT-2134	CIRCULAR	273.65	271.60	552	3
CDT-2135	CIRCULAR	271.60	270.50	100	3
CDT-2136	CIRCULAR	287.29	289.22	878	4.5
CDT-2137_GP	CIRCULAR	284.86	284.66	35	2
CDT-2139	CIRCULAR	322.13	322.10	6	3

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2140	CIRCULAR	322.10	320.38	48	3
CDT-2143	CIRCULAR	327.83	328.00	378	1.5
CDT-2144	CIRCULAR	329.18	329.00	327	1
CDT-2145	CIRCULAR	329.81	329.18	54	1.25
CDT-2146	CIRCULAR	283.61	283.13	323	4
CDT-2147	CIRCULAR	283.13	282.90	153	4
CDT-2148	CIRCULAR	282.90	282.81	63	4
CDT-2149	CIRCULAR	282.81	282.46	231	4
CDT-2150	CIRCULAR	282.46	281.81	368	4
CDT-2152	CIRCULAR	320.57	320.18	389	3
CDT-2153	CIRCULAR	320.18	319.86	316	3.5
CDT-2154	CIRCULAR	319.86	319.59	263	3.5
CDT-2155	CIRCULAR	319.59	319.55	44	3.5
CDT-2156	CIRCULAR	319.55	319.29	266	3.5
CDT-2157	CIRCULAR	319.29	319.09	204	3.5
CDT-2158	CIRCULAR	319.09	318.67	421	3.5
CDT-2159	CIRCULAR	318.67	318.40	263	3.5
CDT-2160	CIRCULAR	318.40	318.37	31	3.5
CDT-2161	CIRCULAR	318.37	317.99	379	4
CDT-2162	CIRCULAR	317.99	317.68	306	4
CDT-2163	CIRCULAR	317.68	317.39	289	4
CDT-2164	CIRCULAR	317.39	317.03	356	4
CDT-2165	CIRCULAR	317.03	316.99	44	4
CDT-2166	CIRCULAR	304.67	304.67	116	4
CDT-2168	FORCE_MAIN	343.33	324.00	35	1.333
CDT-2169	FORCE_MAIN	324.00	325.00	349	1.333
CDT-2170	FORCE_MAIN	325.00	326.50	977	1.333
CDT-2171	FORCE_MAIN	326.50	326.50	19	1.333
CDT-2172	FORCE_MAIN	326.50	322.50	317	1.333
CDT-2173	FORCE_MAIN	322.50	325.50	159	1.333
CDT-2174	FORCE_MAIN	325.50	325.50	341	1.333
CDT-2175	FORCE_MAIN	325.50	328.00	74	1.333
CDT-2176	FORCE_MAIN	328.00	328.00	28	1.333
CDT-2177	CIRCULAR	325.50	324.00	275	2
CDT-2178	CIRCULAR	324.00	323.50	47	2
CDT-2179	CIRCULAR	324.00	323.08	168	2
CDT-2180	CIRCULAR	276.00	275.50	118	4.5
CDT-2181	CIRCULAR	288.22	287.99	231	4.5
CDT-2182	CIRCULAR	288.83	288.22	612	4.5
CDT-2183	CIRCULAR	293.26	292.75	244	2.5
CDT-2184	CIRCULAR	292.65	292.36	150	2.5
CDT-2185	CIRCULAR	292.00	292.13	64	2.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2186	CIRCULAR	287.05	287.00	27	2.5
CDT-2187	CIRCULAR	299.04	294.57	413	1.25
CDT-2188	CIRCULAR	294.57	292.96	826	2
CDT-2189	CIRCULAR	293.58	293.20	178	3.5
CDT-2190	CIRCULAR	293.20	292.70	226	3.5
CDT-2191	CIRCULAR	292.70	291.99	332	3.5
CDT-2192	CIRCULAR	291.73	291.84	54	3
CDT-2193	CIRCULAR	294.31	293.87	443	3
CDT-2194	CIRCULAR	296.22	296.03	277	2.5
CDT-2195	CIRCULAR	296.72	296.32	578	2.5
CDT-2196	CIRCULAR	293.04	292.92	60	2.5
CDT-2197	CIRCULAR	296.98	296.75	318	2.5
CDT-2198	CIRCULAR	297.27	297.08	271	2.5
CDT-2199_GP	CIRCULAR	290.83	290.45	170	1.5
CDT-2200_GP	CIRCULAR	288.60	287.00	181	1.5
CDT-2203_GP	CIRCULAR	287.25	287.10	50	2
CDT-2204	CIRCULAR	329.00	328.00	104	2
CDT-2205	CIRCULAR	323.61	323.46	311	2
CDT-2206	CIRCULAR	323.46	323.30	316	2
CDT-2207	CIRCULAR	328.00	327.55	447	2
CDT-2208_GP	CIRCULAR	332.18	331.08	500	2
CDT-2209_GP	CIRCULAR	323.00	315.00	106	2.5
CDT-2210	CIRCULAR	298.97	298.24	1,217	5
CDT-2211	CIRCULAR	298.24	298.22	31	5
CDT-2212	CIRCULAR	308.95	308.29	466	2
CDT-2213	CIRCULAR	308.24	308.04	95	2
CDT-2214_GP	CIRCULAR	307.50	307.26	190	4.5
CDT-2215_GP	CIRCULAR	307.26	306.82	404	4.5
CDT-2216_GP	CIRCULAR	306.82	306.44	339	4.5
CDT-2217_GP	CIRCULAR	306.44	306.07	340	4.5
CDT-2218_GP	CIRCULAR	306.07	305.70	332	4.5
CDT-2219_GP	CIRCULAR	305.70	305.25	327	4.5
CDT-2220_GP	CIRCULAR	305.25	304.83	299	4.5
CDT-2221_GP	CIRCULAR	304.83	304.14	488	4.5
CDT-2222	CIRCULAR	333.89	333.79	38	1.5
CDT-2223	FORCE_MAIN	300.00	301.00	497	0.667
CDT-2224	FORCE_MAIN	301.00	305.75	91	0.667
CDT-2225	FORCE_MAIN	305.75	305.75	38	0.667
CDT-2226_GP	CIRCULAR	320.80	319.94	244	3
CDT-2227_GP	CIRCULAR	319.94	319.00	265	3
CDT-2228_GP	CIRCULAR	319.44	318.95	252	3.5
CDT-2229_GP	CIRCULAR	317.82	317.40	416	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2230	CIRCULAR	297.63	297.63	40	3.5
CDT-2231	CIRCULAR	297.64	297.63	347	3.5
CDT-2232	CIRCULAR	297.42	296.85	982	3.5
CDT-2233	CIRCULAR	285.87	283.54	458	1.75
CDT-2234	CIRCULAR	282.74	282.58	205	2.5
CDT-2235	CIRCULAR	306.25	302.36	88	1.167
CDT-2236	CIRCULAR	302.26	302.02	262	2
CDT-2237	CIRCULAR	302.02	301.70	357	2
CDT-2238	CIRCULAR	301.70	301.25	500	2
CDT-2239	CIRCULAR	301.25	300.83	500	2
CDT-2240	CIRCULAR	342.36	342.00	374	2
CDT-2241	FORCE_MAIN	345.00	344.97	36	0.5
CDT-2242	FORCE_MAIN	344.97	344.53	497	0.5
CDT-2243	FORCE_MAIN	344.53	344.50	45	0.5
CDT-2244	FORCE_MAIN	344.50	344.00	594	0.5
CDT-2245	CIRCULAR	344.00	340.06	645	1.5
CDT-2246	CIRCULAR	340.06	337.96	344	1.75
CDT-2247	CIRCULAR	316.29	315.71	329	2
CDT-2248	CIRCULAR	315.71	315.60	130	2
CDT-2249	CIRCULAR	315.60	315.40	50	2
CDT-2250	CIRCULAR	322.00	321.90	75	2
CDT-2251	CIRCULAR	318.00	317.61	338	1.75
CDT-2252	CIRCULAR	317.61	317.23	310	1.75
CDT-2253	CIRCULAR	319.00	318.62	94	1
CDT-2254	CIRCULAR	330.19	330.00	138	1.5
CDT-2255	CIRCULAR	330.69	330.10	395	1
CDT-2256	CIRCULAR	330.00	329.24	1,152	1.5
CDT-2257	CIRCULAR	329.24	329.00	231	1.5
CDT-2258	CIRCULAR	316.09	316.50	411	3
CDT-2259	CIRCULAR	315.88	316.09	203	3
CDT-2260	CIRCULAR	323.55	321.30	44	3
CDT-2261	CIRCULAR	328.92	327.30	898	1
CDT-2262	CIRCULAR	327.30	326.82	216	1.25
CDT-2263	CIRCULAR	326.82	326.49	696	1.25
CDT-2264	CIRCULAR	326.24	325.51	349	1.5
CDT-2265	CIRCULAR	325.26	324.58	702	1.75
CDT-2266	CIRCULAR	329.44	329.12	294	2
CDT-2267	CIRCULAR	328.46	328.15	301	2
CDT-2268	CIRCULAR	307.98	307.28	651	3
CDT-2269	CIRCULAR	307.28	306.68	593	3
CDT-2270	CIRCULAR	306.68	306.58	80	3
CDT-2271	CIRCULAR	306.58	306.21	268	3

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2272	CIRCULAR	276.63	274.93	412	2
CDT-2273	CIRCULAR	277.98	276.83	330	2
CDT-2274	CIRCULAR	279.37	277.98	475	1.75
CDT-2275	CIRCULAR	279.21	279.37	24	3
CDT-2276	CIRCULAR	282.40	280.18	542	0.67
CDT-2278	CIRCULAR	300.38	300.17	180	2.5
CDT-2279_GP	CIRCULAR	307.99	307.84	17	2.5
CDT-2280	CIRCULAR	306.21	306.35	15	3
CDT-2281	CIRCULAR	326.48	320.91	15	2
CDT-2282_EX	CIRCULAR	315.00	314.50	50	3
CDT-2283	CIRCULAR	300.07	300.07	10	2.5
CDT-2284	CIRCULAR	301.00	301.50	10	3
CDT-2285	CIRCULAR	326.21	325.84	75	2
CDT-2286_GP	CIRCULAR	310.20	310.20	61	1
CDT-2287_GP	CIRCULAR	299.00	298.00	106	2
CDT-2288_GP	CIRCULAR	287.00	286.90	4	2.5
CDT-2289_GP	CIRCULAR	287.00	286.90	4	2.5
CDT-2290	CIRCULAR	329.85	330.10	62	2
CDT-2291	CIRCULAR	303.43	303.32	225	2.5
CDT-2292	CIRCULAR	323.81	323.63	57	2
CDT-2293_GP	CIRCULAR	316.00	312.88	60	1
CDT-2294	CIRCULAR	292.00	292.20	45	3
CDT-2295	CIRCULAR	278.00	277.95	4	2
CDT-2296	CIRCULAR	303.00	299.50	60	2.25
CDT-2297	CIRCULAR	291.87	291.55	104	1
CDT-2298	CIRCULAR	281.25	281.25	50	2
CDT-2299	CIRCULAR	304.18	304.18	7	1.67
CDT-2300	CIRCULAR	309.00	309.00	8	2
CDT-2301_GP	CIRCULAR	300.00	291.08	45	1.5
CDT-2302_GP	CIRCULAR	335.00	335.00	30	2
CDT-2303	CIRCULAR	307.00	307.00	15	1.5
CDT-2306	CIRCULAR	306.00	306.00	8	1
CDT-2307_GP	CIRCULAR	320.50	320.50	25	2
CDT-2308_GP	CIRCULAR	318.77	318.66	154	2.5
CDT-2309_GP	CIRCULAR	323.68	319.66	456	1.5
CDT-2310_GP	CIRCULAR	324.55	323.68	461	1.5
CDT-2311_GP	CIRCULAR	325.02	324.80	150	1.25
CDT-2312_GP	CIRCULAR	318.56	318.17	274	2.5
CDT-2313	CIRCULAR	322.77	322.74	22	1.5
CDT-2314	CIRCULAR	322.64	322.19	558	1.5
CDT-2315	CIRCULAR	322.19	321.47	400	1.5
CDT-2316	CIRCULAR	323.43	324.38	20	2.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-2317	CIRCULAR	321.47	320.94	441	1.5
CDT-2318	CIRCULAR	323.46	321.50	23	0.67
CDT-2319	CIRCULAR	320.94	322.95	536	1.5
CDT-2320	CIRCULAR	322.90	319.93	204	1.5
CDT-2321	CIRCULAR	319.93	319.28	323	1.5
CDT-2322	CIRCULAR	319.83	316.50	277	1.75
CDT-2323	CIRCULAR	288.40	288.40	60	1.5
CDT-2324	CIRCULAR	291.00	290.90	120	2.5
CDT-2325	CIRCULAR	291.99	291.00	126	3.5
CDT-2326	TRAPEZOIDAL	0.00	0.00	400	1.5
CDT-2327	TRAPEZOIDAL	0.00	0.00	400	1.5
CDT-2328	TRAPEZOIDAL	0.00	0.00	400	1.5
CDT-2329	TRAPEZOIDAL	0.00	0.00	400	1.5
CDT-2330	CIRCULAR	287.05	288.40	10	3.5
CDT-2331	CIRCULAR	296.54	295.35	595	2
CDT-2332	CIRCULAR	304.25	302.50	2,520	4
CDT-291_GP	CIRCULAR	327.81	325.85	221	1.75
CDT-295	CIRCULAR	324.38	324.30	195	2.5
CDT-297	CIRCULAR	324.30	324.18	300	2.5
CDT-299	CIRCULAR	324.18	323.82	551	2.5
CDT-3000_GP	CIRCULAR	330.87	329.47	1,405	3.5
CDT-3001_GP	CIRCULAR	328.95	327.80	1,150	3.5
CDT-3002_GP	CIRCULAR	327.80	327.66	140	4.5
CDT-3003_GP	CIRCULAR	330.89	329.57	1,320	3
CDT-3004_GP	CIRCULAR	327.66	327.25	410	5
CDT-3005_GP	CIRCULAR	321.10	319.87	1,235	3
CDT-3006_GP	CIRCULAR	319.87	318.44	1,430	3
CDT-3007_GP	CIRCULAR	318.44	317.76	680	4
CDT-3008_GP	CIRCULAR	317.76	317.50	255	4
CDT-301	CIRCULAR	323.82	310.83	338	2.5
CDT-3010_GP	CIRCULAR	322.39	320.99	1,393	3
CDT-3011_GP	CIRCULAR	320.99	319.47	1,525	4
CDT-3012_GP	CIRCULAR	314.00	313.68	325	4
CDT-3013_GP	CIRCULAR	316.94	315.64	1,300	2
CDT-3014_GP	CIRCULAR	325.25	324.71	539	2
CDT-3015_GP	CIRCULAR	324.71	323.56	1,144	2
CDT-3016_GP	CIRCULAR	323.56	322.00	1,486	3.5
CDT-3018_GP	CIRCULAR	322.93	305.86	1,038	3.5
CDT-3019_GP	CIRCULAR	310.69	309.07	1,615	4
CDT-3020_GP	CIRCULAR	309.07	308.01	1,065	5
CDT-3021_GP	CIRCULAR	308.01	307.47	535	5
CDT-3022_GP	CIRCULAR	311.96	309.95	2,015	3

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-3023_GP	CIRCULAR	309.95	309.59	235	3.5
CDT-3024_GP	CIRCULAR	311.97	309.25	2,715	2
CDT-3025_GP	CIRCULAR	309.25	308.91	345	2
CDT-3026_GP	CIRCULAR	305.99	305.43	560	3
CDT-3027_GP	CIRCULAR	305.43	304.70	735	3
CDT-3028_GP	CIRCULAR	304.70	303.58	1,120	3.5
CDT-3029_GP	CIRCULAR	303.58	302.87	705	4
CDT-3030_GP	CIRCULAR	302.87	301.94	930	4
CDT-3031_GP	CIRCULAR	301.94	300.63	1,310	4
CDT-3032_GP	CIRCULAR	300.63	300.22	410	4
CDT-3033_GP	CIRCULAR	298.02	296.08	1,945	3.5
CDT-3034_GP	CIRCULAR	296.08	295.09	985	4
CDT-3035_GP	CIRCULAR	295.09	294.82	270	4
CDT-3036_GP	CIRCULAR	301.25	300.36	890	3
CDT-3037_GP	CIRCULAR	292.55	289.98	2,575	3
CDT-3038_GP	CIRCULAR	289.98	288.61	1,370	4.5
CDT-3039_GP	CIRCULAR	288.61	286.49	2,120	4
CDT-3040_GP	CIRCULAR	286.49	286.09	400	4
CDT-3041_GP	CIRCULAR	286.09	285.70	390	5
CDT-3042_GP	CIRCULAR	293.00	288.61	1,914	3
CDT-3045_GP	CIRCULAR	290.54	289.20	1,340	3
CDT-3047_GP	CIRCULAR	289.67	288.95	724	4
CDT-3048_GP	CIRCULAR	290.88	289.67	1,213	3
CDT-3049_GP	CIRCULAR	283.53	282.85	680	3
CDT-305	CIRCULAR	324.97	322.00	104	1.75
CDT-3050_GP	CIRCULAR	283.92	283.53	390	3
CDT-3051_GP	CIRCULAR	284.29	283.92	365	2
CDT-3052_GP	CIRCULAR	284.96	284.29	675	2
CDT-3053_GP	CIRCULAR	309.79	308.42	1,370	2
CDT-3054_GP	CIRCULAR	308.42	307.43	990	3
CDT-3056_GP	CIRCULAR	309.20	308.30	678	2
CDT-3057_GP	CIRCULAR	279.37	278.96	410	5
CDT-3058_GP	CIRCULAR	280.70	279.37	1,325	4
CDT-3059_GP	CIRCULAR	285.85	284.58	1,265	4
CDT-3060_GP	CIRCULAR	284.58	281.96	2,620	5
CDT-3061_GP	CIRCULAR	287.54	286.87	670	3.5
CDT-3062_GP	CIRCULAR	286.87	286.38	490	4
CDT-3063_GP	CIRCULAR	287.09	286.34	750	2
CDT-3064_GP	CIRCULAR	289.88	288.66	1,220	3
CDT-3065_GP	CIRCULAR	288.66	287.54	1,119	3
CDT-3066_GP	CIRCULAR	282.70	282.29	406	4
CDT-3067_GP	CIRCULAR	289.95	289.44	508	4

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-3068_GP	CIRCULAR	290.68	289.95	728	3
CDT-3069_GP	CIRCULAR	291.89	290.68	1,209	2
CDT-3070_GP	CIRCULAR	297.08	295.97	800	3
CDT-3071_GP	CIRCULAR	290.90	290.28	620	3
CDT-3072_GP	CIRCULAR	290.28	289.96	320	3
CDT-3073_GP	CIRCULAR	290.69	289.01	1,102	2
CDT-3074_GP	CIRCULAR	289.01	288.26	322	2
CDT-3075_GP	CIRCULAR	293.87	292.87	85	2
CDT-3076_GP	CIRCULAR	287.60	286.89	674	3.5
CDT-3076_GP2	CIRCULAR	288.26	287.60	334	2
CDT-3076_parallel_GP	CIRCULAR	288.26	287.60	332	2
CDT-3077_GP	CIRCULAR	286.89	286.38	345	3.5
CDT-3078_GP	CIRCULAR	289.20	287.00	2,200	3
CDT-3079_GP	CIRCULAR	287.00	286.28	715	4.5
CDT-3080_GP	CIRCULAR	284.82	283.96	2,655	1.5
CDT-3081_GP	CIRCULAR	283.96	282.75	2,640	1.5
CDT-3082_GP	CIRCULAR	282.75	281.56	2,620	1.5
CDT-3083_GP	CIRCULAR	281.56	280.56	1,485	1.5
CDT-3084_GP	CIRCULAR	280.56	271.29	185	1.5
CDT-3085_GP	CIRCULAR	293.60	292.68	2,650	1.5
CDT-3086_GP	CIRCULAR	292.68	291.50	2,620	1.5
CDT-3087_GP	CIRCULAR	291.50	288.21	2,645	2
CDT-3088_GP	CIRCULAR	291.88	288.21	2,625	1.5
CDT-3089_GP	CIRCULAR	288.21	287.33	1,975	2
CDT-3090_GP	CIRCULAR	300.59	297.82	2,769	3
CDT-3091_GP	CIRCULAR	297.82	295.72	2,100	4.5
CDT-3093_GP	CIRCULAR	298.00	296.69	1,310	3.5
CDT-3094_GP	CIRCULAR	296.69	296.11	580	4.5
CDT-3095_GP	CIRCULAR	301.00	299.66	1,336	2
CDT-3098_GP	CIRCULAR	306.75	288.00	160	2
CDT-3099_GP	CIRCULAR	307.38	306.75	370	2
CDT-31_GP	CIRCULAR	322.00	321.30	2,394	3
CDT-3100_GP	CIRCULAR	310.75	307.38	1,550	1.5
CDT-3101_GP	CIRCULAR	315.92	312.49	790	2.5
CDT-3102_GP	CIRCULAR	344.15	342.72	1,430	2.5
CDT-3103_GP	CIRCULAR	328.66	328.07	590	3
CDT-3104_GP	CIRCULAR	328.07	327.56	510	3
CDT-3105_GP	CIRCULAR	325.91	325.81	100	3
CDT-3106_GP	CIRCULAR	327.56	326.99	570	3
CDT-3107_GP	CIRCULAR	325.93	325.57	240	1
CDT-3108_GP	CIRCULAR	325.57	325.02	365	1
CDT-3109_GP	CIRCULAR	325.83	324.66	615	1.5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-3110_GP	CIRCULAR	324.66	324.30	170	1.5
CDT-3111_GP	CIRCULAR	324.54	324.30	160	1
CDT-3112_GP	CIRCULAR	324.81	324.54	175	1
CDT-3113_GP	CIRCULAR	324.30	323.99	212	1.5
CDT-3114_GP	CIRCULAR	323.99	323.70	188	1.5
CDT-3115_GP	CIRCULAR	323.70	322.95	500	1.5
CDT-3116_GP	CIRCULAR	322.95	322.82	89	1.5
CDT-3117_GP	FORCE_MAIN	342.42	335.00	1,246	0.5
CDT-3118_GP	CIRCULAR	335.00	334.50	10	0.5
CDT-3119_GP	CIRCULAR	326.67	326.43	99	1
CDT-3120_GP	CIRCULAR	325.52	324.40	1,120	3
CDT-3121_GP	CIRCULAR	324.40	324.30	100	3.5
CDT-3122_GP	CIRCULAR	327.19	326.80	390	2
CDT-3123_GP	CIRCULAR	326.80	325.91	890	3
CDT-3124_GP	CIRCULAR	306.56	305.25	770	3
CDT-3125_GP	CIRCULAR	308.66	306.56	1,500	3
CDT-333	CIRCULAR	300.61	299.84	852	2
CDT-335	CIRCULAR	299.84	299.67	184	2.5
CDT-337	CIRCULAR	300.09	299.67	233	2
CDT-339	CIRCULAR	299.67	298.91	748	2.5
CDT-341	CIRCULAR	299.72	299.14	769	2
CDT-343	CIRCULAR	298.81	298.49	723	3
CDT-345	CIRCULAR	298.24	297.89	651	3.5
CDT-347	CIRCULAR	299.31	298.75	736	2
CDT-349	CIRCULAR	297.89	297.64	475	3.5
CDT-353	CIRCULAR	299.18	298.74	1,584	2.5
CDT-355	CIRCULAR	297.59	296.99	597	3.5
CDT-361	CIRCULAR	303.06	301.75	721	2.25
CDT-363	CIRCULAR	301.50	301.25	896	2.5
CDT-367	CIRCULAR	301.25	300.89	387	2.5
CDT-369	CIRCULAR	300.89	300.60	278	2.5
CDT-37_GP	CIRCULAR	320.00	312.00	356	2.5
CDT-371	CIRCULAR	302.66	300.44	1,003	2
CDT-375	CIRCULAR	303.00	301.70	698	1.5
CDT-377	CIRCULAR	316.05	314.77	641	2
CDT-379	CIRCULAR	314.77	312.42	1,568	2
CDT-381	CIRCULAR	312.42	309.60	1,877	2
CDT-39	CIRCULAR	335.21	333.71	963	2
CDT-393	CIRCULAR	299.00	296.80	90	1.75
CDT-397_GP	CIRCULAR	291.58	291.08	177	1.5
CDT-401	CIRCULAR	304.80	303.90	293	1.5
CDT-403	CIRCULAR	300.60	300.00	248	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-405	CIRCULAR	300.60	300.00	284	3.5
CDT-409_GP	CIRCULAR	301.44	298.80	380	2
CDT-41	CIRCULAR	333.21	331.11	1,204	2.5
CDT-411_GP	CIRCULAR	297.30	296.58	429	3.5
CDT-413_GP	CIRCULAR	298.19	297.58	1,170	2.5
CDT-415_GP	CIRCULAR	299.00	298.69	521	2
CDT-417_GP	CIRCULAR	296.58	294.00	182	3.5
CDT-419_GP	CIRCULAR	302.12	301.44	1,061	2
CDT-421_GP	CIRCULAR	300.44	300.00	631	3
CDT-423_GP	CIRCULAR	300.00	299.13	757	3
CDT-425_GP	CIRCULAR	299.13	297.80	995	3
CDT-429	CIRCULAR	321.01	320.95	150	1.67
CDT-43	CIRCULAR	332.00	331.61	251	2
CDT-431	CIRCULAR	321.06	321.01	70	2
CDT-433	CIRCULAR	316.76	315.35	376	1
CDT-435	CIRCULAR	316.76	315.35	385	1
CDT-437	CIRCULAR	319.40	316.80	693	1
CDT-439	CIRCULAR	318.85	315.35	1,086	1.5
CDT-441	CIRCULAR	318.90	318.85	41	1.5
CDT-443	CIRCULAR	317.23	316.29	584	2
CDT-447	CIRCULAR	322.00	321.00	974	1
CDT-45	CIRCULAR	330.61	329.97	315	3
CDT-451	CIRCULAR	320.95	320.80	313	1.666
CDT-455	CIRCULAR	326.22	319.50	1,846	1
CDT-457	CIRCULAR	326.22	319.50	1,869	1
CDT-465	CIRCULAR	326.93	326.31	416	2
CDT-467	CIRCULAR	326.93	325.47	942	1
CDT-469	CIRCULAR	329.00	326.25	1,395	1.75
CDT-47	CIRCULAR	329.97	328.99	253	3
CDT-471	CIRCULAR	329.67	328.16	1,221	1
CDT-483	CIRCULAR	329.37	328.00	542	4
CDT-49	CIRCULAR	328.99	327.50	358	3
CDT-51_GP	CIRCULAR	302.00	301.26	517	2
CDT-53_GP	CIRCULAR	301.26	298.00	344	2
CDT-55_GP	CIRCULAR	301.33	299.77	1,244	3.5
CDT-57_GP	CIRCULAR	299.77	299.36	304	3.5
CDT-587	CIRCULAR	334.25	326.46	288	3
CDT-59_GP	CIRCULAR	299.36	298.60	440	3.5
CDT-591	CIRCULAR	333.80	326.46	621	2.5
CDT-597_GP	CIRCULAR	320.80	319.94	428	3
CDT-601	CIRCULAR	310.15	308.50	1,227	3.5
CDT-603	CIRCULAR	308.00	304.25	5,417	4

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-605	CIRCULAR	277.50	276.00	273	2.5
CDT-607	CIRCULAR	276.00	275.00	996	2.5
CDT-61_GP	CIRCULAR	298.60	298.00	461	3.5
CDT-621	CIRCULAR	331.10	327.50	621	2
CDT-63_GP	CIRCULAR	305.63	302.76	1,147	2
CDT-631	CIRCULAR	330.70	330.45	250	3.5
CDT-633	CIRCULAR	325.25	324.32	278	3.5
CDT-639	CIRCULAR	296.99	296.85	555	3.5
CDT-65_GP	CIRCULAR	302.76	302.39	302	2
CDT-655	CIRCULAR	315.00	313.74	762	2
CDT-657	CIRCULAR	312.74	312.40	161	3
CDT-659	CIRCULAR	311.90	310.15	492	3.5
CDT-67_GP	CIRCULAR	302.39	300.22	614	2.5
CDT-673_GP	CIRCULAR	317.00	310.00	1,232	2
CDT-69_GP	CIRCULAR	298.40	298.00	849	5
CDT-701	CIRCULAR	300.44	300.00	221	2
CDT-71_GP	CIRCULAR	310.13	309.76	307	2
CDT-713	CIRCULAR	303.01	301.07	351	1.25
CDT-73_GP	CIRCULAR	309.66	309.14	362	2
CDT-75_GP	CIRCULAR	298.90	298.50	318	5
CDT-757	CIRCULAR	300.60	300.38	215	2.5
CDT-761_GP	CIRCULAR	304.00	302.27	494	3
CDT-763_GP	CIRCULAR	304.53	303.94	538	2.5
CDT-765_GP	CIRCULAR	302.94	302.74	305	3.5
CDT-767_GP	CIRCULAR	302.74	301.50	341	3.5
CDT-769_GP	CIRCULAR	301.50	301.33	1,077	3.5
CDT-77_GP	CIRCULAR	312.00	310.25	1,191	2.5
CDT-773_GP	CIRCULAR	307.00	306.50	304	2
CDT-775_GP	CIRCULAR	306.00	303.94	917	2.5
CDT-777	CIRCULAR	301.00	297.50	718	2.5
CDT-779	CIRCULAR	302.50	301.50	1,099	2
CDT-781	CIRCULAR	297.78	297.52	979	2
CDT-79_GP	CIRCULAR	314.16	312.82	1,313	3.5
CDT-793	CIRCULAR	301.20	300.44	305	2
CDT-795	CIRCULAR	302.50	296.00	2,879	4
CDT-797	CIRCULAR	296.00	293.51	2,779	4
CDT-801	CIRCULAR	294.21	293.60	1,262	2.5
CDT-803	CIRCULAR	292.60	291.99	645	3.5
CDT-805	CIRCULAR	291.99	290.12	819	3.5
CDT-807	CIRCULAR	290.12	289.39	553	3.5
CDT-809	CIRCULAR	289.39	289.07	285	3.5
CDT-81_GP	CIRCULAR	312.73	308.15	1,205	4

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-811	CIRCULAR	289.07	288.60	439	3.5
CDT-813	CIRCULAR	288.60	288.29	236	3.5
CDT-815	CIRCULAR	295.20	294.21	681	2.5
CDT-819	CIRCULAR	291.00	290.89	791	2
CDT-823_GP	CIRCULAR	289.90	288.00	209	3
CDT-825_GP	CIRCULAR	291.36	289.90	720	3
CDT-827_GP	CIRCULAR	293.42	291.76	826	3
CDT-829_GP	CIRCULAR	291.76	291.36	184	3
CDT-831_GP	CIRCULAR	297.72	297.56	334	2
CDT-833_GP	CIRCULAR	297.06	296.26	400	2.5
CDT-835_GP	CIRCULAR	296.26	293.92	1,412	2.5
CDT-837	CIRCULAR	293.51	289.20	2,479	4
CDT-843	CIRCULAR	284.08	282.32	2,600	4
CDT-845	CIRCULAR	282.32	280.34	2,618	4
CDT-847	CIRCULAR	280.34	278.68	1,173	4
CDT-849	CIRCULAR	278.68	269.61	3,766	4
CDT-851	CIRCULAR	269.61	262.00	508	4
CDT-853	CIRCULAR	274.00	262.00	556	1.5
CDT-855	CIRCULAR	289.22	289.00	578	4.5
CDT-859_GP	CIRCULAR	324.00	320.50	779	2
CDT-861	CIRCULAR	330.47	327.50	845	5
CDT-863	CIRCULAR	332.01	330.94	262	5
CDT-865	CIRCULAR	339.00	338.37	528	2
CDT-869	CIRCULAR	338.12	337.40	930	2.25
CDT-871	CIRCULAR	336.65	334.25	1,120	3
CDT-873	CIRCULAR	339.25	338.00	446	2
CDT-875	CIRCULAR	338.00	337.50	310	2
CDT-877	CIRCULAR	337.25	336.80	293	2.25
CDT-879	CIRCULAR	336.80	335.88	761	2.25
CDT-883	CIRCULAR	335.63	333.80	1,201	2.5
CDT-885	CIRCULAR	336.33	335.83	489	2
CDT-887	CIRCULAR	335.33	334.77	273	2.5
CDT-889	CIRCULAR	334.77	334.25	251	2.5
CDT-89_GP	CIRCULAR	304.14	302.66	1,346	5
CDT-891	CIRCULAR	334.25	331.70	1,693	2.5
CDT-893	CIRCULAR	333.12	332.20	858	2.5
CDT-895	CIRCULAR	332.54	332.29	583	2
CDT-897	CIRCULAR	332.29	332.20	457	2
CDT-899	CIRCULAR	327.82	326.75	962	2
CDT-901	CIRCULAR	326.51	325.25	1,342	3
CDT-903	CIRCULAR	326.80	326.51	237	3
CDT-905	CIRCULAR	330.10	328.48	1,090	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-907	CIRCULAR	327.98	327.60	709	2.5
CDT-909	CIRCULAR	327.10	326.80	450	3
CDT-91_GP	CIRCULAR	302.66	300.27	1,048	5
CDT-911	CIRCULAR	327.98	327.98	76	2.5
CDT-913	CIRCULAR	328.80	328.48	1,311	2
CDT-915	CIRCULAR	329.00	328.80	251	2
CDT-917_GP	CIRCULAR	317.90	317.82	269	1.5
CDT-919	CIRCULAR	333.70	329.37	2,542	4
CDT-921	CIRCULAR	330.24	329.36	652	2
CDT-923	CIRCULAR	328.86	326.50	1,061	2.5
CDT-925	CIRCULAR	326.50	326.25	499	2.5
CDT-93_GP	CIRCULAR	300.27	298.90	1,150	5
CDT-937	CIRCULAR	316.80	316.76	12	1
CDT-939	CIRCULAR	326.31	317.23	237	2
CDT-941	CIRCULAR	326.25	317.23	315	1.75
CDT-943	CIRCULAR	327.16	326.93	140	1
CDT-945	FORCE_MAIN	321.06	320.76	476	1.67
CDT-95_GP	CIRCULAR	308.00	305.66	659	2
CDT-953	CIRCULAR	321.00	320.80	850	1.5
CDT-955	CIRCULAR	322.00	321.00	332	1.5
CDT-959	CIRCULAR	290.91	279.64	289	2
CDT-961	CIRCULAR	291.89	279.30	706	5
CDT-963	CIRCULAR	296.64	296.19	576	2
CDT-965	CIRCULAR	296.19	295.06	939	2
CDT-967	CIRCULAR	295.51	295.06	733	2
CDT-969	CIRCULAR	294.56	294.37	169	2.5
CDT-97_GP	CIRCULAR	306.98	306.14	1,410	3
CDT-971	CIRCULAR	293.87	292.89	1,064	3
CDT-973	CIRCULAR	295.97	295.45	342	3.5
CDT-975	CIRCULAR	295.45	295.02	276	3.5
CDT-977	CIRCULAR	294.52	294.15	564	3.5
CDT-979	CIRCULAR	293.65	293.29	244	4
CDT-981	CIRCULAR	293.29	293.12	318	4
CDT-983	CIRCULAR	293.12	292.89	383	4
CDT-985	CIRCULAR	291.71	290.91	502	2
CDT-987	CIRCULAR	291.98	291.71	181	2
CDT-99_GP	CIRCULAR	306.00	304.50	1,129	2.5
CDT-997	CIRCULAR	285.72	285.00	348	3
CDT-999	CIRCULAR	287.42	287.28	570	2
CDT-A2801	CIRCULAR	287.22	281.85	566	2.5
CDT-A2802	CIRCULAR	289.78	287.32	3,552	2.5
CDT-A2803	CIRCULAR	290.54	289.78	424	2

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
CDT-A2804	CIRCULAR	294.28	290.54	2,728	2
CDT-A2805	CIRCULAR	296.48	294.28	1,323	1
CDT-Aover1	CIRCULAR	295.00	294.00	22	1
CDT-Aover2	CIRCULAR	295.00	294.00	22	1
CDT-Aover3	CIRCULAR	295.00	294.00	22	1
CDT-Burke_1_GP	CIRCULAR	324.58	322.38	550	2
CDT-Burke_2_GP	CIRCULAR	324.16	322.38	445	2
CDT-Burke_3_GP	CIRCULAR	322.38	319.58	700	2
CDT-Burke_4_GP	CIRCULAR	319.58	316.58	750	2
CDT-Burke_5_GP	CIRCULAR	314.76	303.58	200	4
CDT-CameronCreek_N	CIRCULAR	323.18	310.00	1,730	4
CDT-GD1	CIRCULAR	254.00	254.00	137	2.5
CDT-GOverflow	CIRCULAR	305.50	302.39	100	1.25
CDT-NEScenic2	CIRCULAR	284.00	284.86	83	2
CG-11	CIRCULAR	313.73	307.89	3,875	2.5
CG-12	CIRCULAR	307.89	306.00	1,217	2.5
CG-13a	CIRCULAR	304.50	301.44	1,400	4
CG-13b	CIRCULAR	301.44	299.82	1,789	4
CG-14	CIRCULAR	299.82	295.47	2,841	4
CG-15	CIRCULAR	295.47	290.00	433	4
Link-01vista_GP	CIRCULAR	326.78	324.30	925	2
CA-3_GP	CIRCULAR	287.50	287.00	1,468	3
CA-2_GP	CIRCULAR	286.00	285.00	1,255	4
CA-1_GP	CIRCULAR	285.00	283.54	1,457	4
CA-6_GP	CIRCULAR	293.00	290.00	2,355	3
CA-7_GP	CIRCULAR	290.00	288.88	1,124	3
CA-8_GP	TRAPEZOIDAL	300.00	294.00	3,893	4
CDT-EGoshen	CIRCULAR	320.38	318.67	1,382	3
CDT-islandOaks1_GP	CIRCULAR	330.03	327.81	50	1
CDT-isOak_GP	CIRCULAR	330.57	325.50	400	0.66
MD-1_GP	TRAPEZOIDAL	314.50	314.17	600	5
MD-2_GP	CIRCULAR	312.50	312.50	115	4.5
MD-3_GP	TRAPEZOIDAL	313.00	311.00	400	5
MD-4_GP	TRAPEZOIDAL	325.50	327.67	535	5
MD-5_GP	RECT_CLOSED	327.67	327.67	20	6
MD-6_GP	TRAPEZOIDAL	327.67	325.60	275	5
MD-7_GP	RECT_CLOSED	325.60	325.50	58	5.33
MD-8_GP	TRAPEZOIDAL	325.50	325.00	693	5
MD-9_GP	TRAPEZOIDAL	325.00	325.50	345	5
MD-10_GP	RECT_CLOSED	325.50	325.50	70	5
MD-16_GP	TRAPEZOIDAL	325.50	325.40	1,363	5
MD-17_GP	RECT_CLOSED	325.40	325.40	147	5

Table G-2. Future Conditions Conduits

Conduit Name	Type	U/S Invert Elevation (ft)	D/S Invert Elevation (ft)	Length (ft)	Diameter (ft)
MD-18_GP	TRAPEZOIDAL	325.40	322.63	2,137	5
MD-19_GP	TRAPEZOIDAL	322.63	321.22	1,210	5
MD-20_GP	RECT_CLOSED	321.22	321.15	52	5
MD-21_GP	TRAPEZOIDAL	321.15	321.00	999	5
MD-22_GP	TRAPEZOIDAL	321.00	321.00	479	5
MD-23_GP	TRAPEZOIDAL	321.00	319.46	1,262	5
MD-24_GP	RECT_CLOSED	319.46	319.46	101	5
MD-25_GP	TRAPEZOIDAL	319.46	321.00	1,698	5
MD-26_GP	RECT_CLOSED	317.30	317.30	286	5
MD-27_GP	TRAPEZOIDAL	319.60	319.17	871	4.5
MD-28_GP	CIRCULAR	313.90	313.90	81	4.5
MD-29_GP	TRAPEZOIDAL	318.50	318.18	761	4.5
MD-30_GP	CIRCULAR	313.68	313.68	170	4
MD-31_GP	TRAPEZOIDAL	318.18	316.50	1,007	4.5
MD-32_GP	CIRCULAR	312.83	312.83	60	4
MD-33_GP	TRAPEZOIDAL	315.77	314.50	1,652	4.5
MD-34_GP	RECT_OPEN	311.00	300.00	100	7
CDTN-36	CIRCULAR	302.31	301.67	312	1.25
CDTN-37	CIRCULAR	300.92	299.50	108	2
CDTN-38	CIRCULAR	327.88	326.60	400	1
CDTN-39	CIRCULAR	326.60	326.30	150	1.5
CDTN-40	CIRCULAR	303.70	302.90	671	1.75
CDTN-41	CIRCULAR	303.50	297.80	2,624	1.5
CDTN-42	CIRCULAR	292.42	291.53	504	3.5
CDTN-43	CIRCULAR	301.85	301.60	399	3.5
CDTN-44	CIRCULAR	297.48	297.05	100	2.25
CDTN-45	CIRCULAR	313.27	313.00	400	1
CDTN-46	CIRCULAR	310.30	307.50	1,480	1.5
CDTN-47	CIRCULAR	337.38	334.12	1,148	2
CDTN-48	CIRCULAR	339.86	338.13	722	1.25
CDTN-49_GP	CIRCULAR	314.50	314.50	400	1
CDT-3000_Ex	CIRCULAR	11.70	0.00	15	2
Goshen1	CIRCULAR	288.83	284.08	2,587	4
CDT-841	CIRCULAR	283.98	283.75	151	4
CDTN-51_GP	CIRCULAR	290.40	289.98	400	3
CDT-154_GP	CIRCULAR	329.20	327.90	1,247	3
CDTN-54_GP	CIRCULAR	281.65	279.83	1,820	2.5
CDT-3044_GP	CIRCULAR	298.45	289.67	1,368	3
CDTN-3093_GP	TRAPEZOIDAL	307.00	306.90	1,781	1
CA-9_GP	TRAPEZOIDAL	297.00	296.90	1,576	1
CDTN_100_GP	TRAPEZOIDAL	307.00	306.90	530	1

Table G-3. Future Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STO-G1	STORAGE	290.00	16.5
STOR_FCIP22NE	STORAGE	305.86	23.0
STOR_FCIP22NW	STORAGE	302.00	23.0
STOR_FCIP25W	STORAGE	315.00	23.0
STOR-100_GP	STORAGE	292.00	15.0
STOR-106	STORAGE	280.00	14.0
STOR-110	STORAGE	280.00	12.0
STOR-112	STORAGE	304.67	20.3
STOR-12_GP	STORAGE	315.00	11.8
STOR-14_GP	STORAGE	310.00	15.0
STOR-16	STORAGE	327.50	19.5
STOR-18_GP	STORAGE	298.00	20.0
STOR-19_New_GP	STORAGE	335.00	23.0
STOR-202_GP	STORAGE	327.00	23.0
STOR-204	STORAGE	282.29	10.5
STOR-206	STORAGE	297.63	8.4
STOR-207-B1	STORAGE	289.79	10.0
STOR-207-B2	STORAGE	292.79	6.0
STOR-210	STORAGE	329.81	5.5
STOR-212	STORAGE	326.30	8.6
STOR-213	STORAGE	327.88	7.0
STOR-217	STORAGE	329.81	15.5
STOR-218	STORAGE	288.79	14.0
STOR-22_GP	STORAGE	267.00	35.5
STOR-221	STORAGE	264.79	14.5
STOR-222	STORAGE	271.29	15.0
STOR-223	STORAGE	268.29	16.0
STOR-224	STORAGE	265.29	17.0
STOR-225	STORAGE	268.79	14.5
STOR-226	STORAGE	279.29	15.5
STOR-227	STORAGE	305.79	4.5
STOR-229	STORAGE	323.80	7.0
STOR-233	STORAGE	264.29	21.0
STOR-234	STORAGE	337.50	12.5
STOR-235-A	STORAGE	252.50	7.5
STOR-235-B	STORAGE	248.00	12.0
STOR-235-C	STORAGE	250.50	9.5
STOR-235-D	STORAGE	245.50	14.0
STOR-236_GP	STORAGE	281.81	16.0
STOR-237	STORAGE	286.00	6.0
STOR-238	STORAGE	287.00	2.0

Table G-3. Future Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STOR-239	STORAGE	280.40	13.0
STOR-24	STORAGE	253.50	28.5
STOR-240	STORAGE	277.00	26.0
STOR-242_GC	STORAGE	317.00	5.0
STOR-250_GP	STORAGE	307.84	17.1
STOR-251	STORAGE	300.00	10.0
STOR-252	STORAGE	276.00	13.0
STOR-253_GP	STORAGE	314.00	9.0
STOR-254	STORAGE	318.62	17.4
STOR-255	STORAGE	303.35	17.0
STOR-256	STORAGE	320.91	16.8
STOR-257	STORAGE	311.00	13.0
STOR-258_GP	STORAGE	310.00	33.5
STOR-259	STORAGE	316.50	26.5
STOR-260	STORAGE	293.50	15.5
STOR-261	STORAGE	297.07	15.9
STOR-262	STORAGE	300.00	12.5
STOR-263	STORAGE	319.32	31.2
STOR-264	STORAGE	295.75	22.3
STOR-265	STORAGE	303.40	13.1
STOR-266	STORAGE	321.84	20.2
STOR-267_GP	STORAGE	310.00	19.0
STOR-268_GP	STORAGE	315.48	18.0
STOR-269_GP	STORAGE	297.00	23.0
STOR-270_GP	STORAGE	281.83	19.2
STOR-271_GP	STORAGE	281.83	19.2
STOR-272	STORAGE	326.10	26.9
STOR-273	STORAGE	299.03	11.0
STOR-274	STORAGE	294.46	15.4
STOR-275	STORAGE	324.50	15.5
STOR-276	STORAGE	313.60	13.4
STOR-277	STORAGE	316.00	28.3
STOR-278_GP	STORAGE	312.00	19.0
STOR-279	STORAGE	290.70	20.3
STOR-28	STORAGE	289.00	13.0
STOR-280	STORAGE	304.07	27.9
STOR-281	STORAGE	273.75	29.3
STOR-282	STORAGE	282.80	23.2
STOR-283	STORAGE	326.00	20.0
STOR-284	STORAGE	288.50	14.5
STOR-285	STORAGE	275.50	27.5

Table G-3. Future Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STOR-286	STORAGE	279.75	25.5
STOR-287	STORAGE	297.05	15.0
STOR-288	STORAGE	339.00	9.8
STOR-289	STORAGE	300.00	10.8
STOR-290	STORAGE	326.45	27.1
STOR-291	STORAGE	312.88	22.1
STOR-30_GP	STORAGE	324.72	20.0
STOR-300_GP	STORAGE	311.42	23.0
STOR-301_GP	STORAGE	304.50	23.0
STOR-302_GP	STORAGE	301.00	23.0
STOR-303_GP	STORAGE	295.47	23.0
STOR-304_GP	STORAGE	290.09	23.0
STOR-305_GP	STORAGE	291.64	23.0
STOR-306_GP	STORAGE	283.01	23.0
STOR-307_GP	STORAGE	279.02	23.0
STOR-308_GP	STORAGE	270.00	23.0
STOR-309_GP	STORAGE	303.00	23.0
STOR-310_GP	STORAGE	274.25	25.0
STOR-311_SequoiaGateway	STORAGE	268.11	18.0
STOR-312_GP	STORAGE	268.40	23.0
STOR-313_GP	STORAGE	270.16	23.0
STOR-314_GP	STORAGE	274.40	23.0
STOR-315_GP	STORAGE	281.00	23.0
STOR-317_GP	STORAGE	271.00	23.0
STOR-318_GP	STORAGE	288.00	23.0
STOR-319_CarltonAcres_GP	STORAGE	279.00	18.0
STOR-320_GP	STORAGE	315.00	23.0
STOR-321_GP	STORAGE	300.00	25.2
STOR-322_WW_GP	STORAGE	322.47	26.1
STOR-34_GP	STORAGE	325.85	6.0
STOR-36	STORAGE	322.00	7.6
STOR-38	STORAGE	291.87	10.4
STOR-44_GP	STORAGE	287.00	11.0
STOR-48	STORAGE	263.00	21.0
STOR-50	STORAGE	303.90	4.6
STOR-52	STORAGE	300.00	10.0
STOR-54_GP	STORAGE	284.90	23.1
STOR-58	STORAGE	326.21	12.4
STOR-60_GP	STORAGE	279.30	20.7
STOR-62	STORAGE	281.00	16.0
STOR-64	STORAGE	288.40	17.6

Table G-3. Future Condition Storage Areas

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
STOR-66	STORAGE	275.00	26.0
STOR-68	STORAGE	278.50	26.8
STOR-70_GP	STORAGE	315.00	23.0
STOR-72	STORAGE	330.00	7.0
STOR-74	STORAGE	316.50	14.5
STOR-76	STORAGE	322.50	8.0
STOR-78	STORAGE	319.00	11.0
STOR-80	STORAGE	300.00	8.0
STOR-82	STORAGE	301.00	12.0
STOR-84	STORAGE	305.50	10.5
STOR-86	STORAGE	299.00	17.5
STOR-88	STORAGE	307.89	20.6
STOR-92	STORAGE	316.97	6.0
STOR-94_GP	STORAGE	302.00	24.0
STOR-Caldwell	STORAGE	281.65	14.0
STOR-CameronCreek_N	STORAGE	310.00	22.0
STOR-FCIP15W	STORAGE	270.16	23.0
STOR-FCIP1N	STORAGE	282.00	23.0
STOR-FCIP24_GP	STORAGE	307.00	23.0
STOR-FCIP9N	STORAGE	277.32	23.0
STOR-NEScenic2	STORAGE	281.00	17.0
STOR_308_GP	STORAGE	284.00	23.0

Table G-4. Future Conditions Pumps

Pump Name	Startup Depth	Shutoff Depth
PUMP-11	6.00	4.00
PUMP-13_GP	6.00	3.00
PUMP-15_GP	13.00	3.67
PUMP-201_GP	12.67	5.07
PUMP-202	9.93	7.93
PUMP-203	8.00	6.00
PUMP-204	7.00	4.00
PUMP-205	5.00	2.25
PUMP-206_GP	7.03	3.03
PUMP-207	7.50	4.50
PUMP-208	8.00	3.00
PUMP-21_GP	10.67	5.07
PUMP-210	9.58	6.08
PUMP-211	15.50	7.25
PUMP-212	4.00	2.50
PUMP-214	8.00	4.50
PUMP-215	8.00	2.00
PUMP-213	4.00	2.75
PUMP-216	7.50	4.00
PUMP-217	6.50	3.00
PUMP-218	15.00	10.00
PUMP-219	4.00	2.00
PUMP-220	7.00	4.00
PUMP-221	7.00	4.00
PUMP-222_GP	3.00	1.00
PUMP-223_GP	8.00	4.00
PUMP-224	8.00	4.00
PUMP-225	5.00	3.00
PUMP-226	7.00	3.00
PUMP-227	7.50	0.50
PUMP-228	10.00	6.00
PUMP-229	13.75	5.75
PUMP-23	13.90	10.90
PUMP-230	6.00	3.50
PUMP-27	6.00	4.00
PUMP-29	5.00	3.00
PUMP-300_GP	18.00	5.53
PUMP-31	7.00	3.00
PUMP-35	6.00	3.00
PUMP-39	7.50	0.50
PUMP-41_GP	7.00	4.00

Table G-4. Future Conditions Pumps

Pump Name	Startup Depth	Shutoff Depth
PUMP-43	5.00	2.25
PUMP-45	9.00	6.00
PUMP-49	6.00	3.00
PUMP-51	5.00	1.00
PUMP-53	13.75	5.75
PUMP-57	5.00	2.50
PUMP-61	7.00	4.00
PUMP-63	10.00	8.00
PUMP-65_GP	5.00	2.00
PUMP-G1	4.00	2.00
PUMP-GD1	19.00	4.00

Table G-5. Future Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-100	OUTFALL	308.00	1.0
OFALL-102	OUTFALL	322.25	2.0
OFALL-104	OUTFALL	310.00	0.0
OFALL-106	OUTFALL	333.00	2.3
OFALL-108	OUTFALL	331.00	2.0
OFALL-112	OUTFALL	320.00	0.0
OFALL-114	OUTFALL	316.00	0.0
OFALL-116	OUTFALL	314.00	0.0
OFALL-118	OUTFALL	314.00	0.0
OFALL-120	OUTFALL	307.00	3.5
OFALL-122	OUTFALL	307.00	2.5
OFALL-124	OUTFALL	298.00	0.0
OFALL-126	OUTFALL	302.00	0.0
OFALL-128	OUTFALL	304.00	0.0
OFALL-130	OUTFALL	303.00	2.0
OFALL-132	OUTFALL	308.00	0.0
OFALL-134	OUTFALL	302.78	0.0
OFALL-136	OUTFALL	308.00	0.0
OFALL-138	OUTFALL	344.00	0.0
OFALL-140	OUTFALL	342.70	0.0
OFALL-142	OUTFALL	338.00	0.0
OFALL-144	OUTFALL	342.00	0.0
OFALL-146	OUTFALL	332.00	0.0
OFALL-148	OUTFALL	331.00	0.0
OFALL-150	OUTFALL	330.00	0.0
OFALL-152	OUTFALL	329.00	0.0
OFALL-154	OUTFALL	327.50	2.0
OFALL-156	OUTFALL	326.50	0.0
OFALL-158	OUTFALL	326.00	0.0
OFALL-160	OUTFALL	325.50	0.0
OFALL-162	OUTFALL	323.08	2.0
OFALL-168	OUTFALL	321.00	1.0
OFALL-170	OUTFALL	320.80	1.5
OFALL-172	OUTFALL	320.25	0.0
OFALL-174	OUTFALL	319.90	1.7
OFALL-176	OUTFALL	319.50	1.0
OFALL-178	OUTFALL	319.00	0.0
OFALL-180	OUTFALL	318.50	0.0
OFALL-182	OUTFALL	318.50	0.0
OFALL-184	OUTFALL	316.80	0.0
OFALL-186	OUTFALL	315.35	1.5

Table G-5. Future Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-188	OUTFALL	314.50	0.0
OFALL-190	OUTFALL	314.00	0.0
OFALL-192	OUTFALL	313.40	0.0
OFALL-194	OUTFALL	309.60	2.0
OFALL-196	OUTFALL	311.50	0.0
OFALL-198	OUTFALL	309.80	2.0
OFALL-200	OUTFALL	309.00	0.0
OFALL-2001	OUTFALL	328.00	4.0
OFALL-2002	OUTFALL	313.52	0.0
OFALL-2003	OUTFALL	303.00	0.0
OFALL-2004	OUTFALL	327.55	2.0
OFALL-2005_GP	OUTFALL	342.50	0.0
OFALL-2006	OUTFALL	298.22	5.0
OFALL-2007	OUTFALL	308.00	0.0
OFALL-2008	OUTFALL	317.05	0.0
OFALL-2009	OUTFALL	316.00	0.0
OFALL-2010	OUTFALL	316.00	0.0
OFALL-2011	OUTFALL	317.05	0.0
OFALL-2012	OUTFALL	320.00	0.0
OFALL-2013	OUTFALL	314.00	0.0
OFALL-2014	OUTFALL	314.00	0.0
OFALL-2015	OUTFALL	314.00	0.0
OFALL-2017	OUTFALL	329.00	0.0
OFALL-2018	OUTFALL	329.00	1.5
OFALL-202	OUTFALL	329.45	0.0
OFALL-2020	OUTFALL	344.50	0.0
OFALL-2021	OUTFALL	305.75	0.7
OFALL-2022	OUTFALL	319.50	0.0
OFALL-2023	OUTFALL	319.50	0.0
OFALL-2024	OUTFALL	302.78	0.0
OFALL-2025	OUTFALL	309.00	0.0
OFALL-2026	OUTFALL	312.00	0.0
OFALL-2027	OUTFALL	344.00	0.0
OFALL-2028	OUTFALL	319.90	1.7
OFALL-2029	OUTFALL	319.50	1.0
OFALL-2030	OUTFALL	315.35	1.0
OFALL-2031	OUTFALL	315.35	1.0
OFALL-2032	OUTFALL	341.50	0.0
OFALL-2033_GP	OUTFALL	300.00	0.0
OFALL-2034	OUTFALL	333.60	2.3
OFALL-2035	OUTFALL	328.00	1.5

Table G-5. Future Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-2036	OUTFALL	321.00	0.0
OFALL-2037	OUTFALL	313.52	0.0
OFALL-2038	OUTFALL	304.00	0.0
OFALL-2039	OUTFALL	308.00	0.0
OFALL-204	OUTFALL	348.00	0.0
OFALL-2040	OUTFALL	310.00	0.0
OFALL-2041	OUTFALL	0.00	0.0
OFALL-2042	OUTFALL	308.00	0.0
OFALL-2043	OUTFALL	315.00	0.0
OFALL-2044_GP	OUTFALL	291.08	1.5
OFALL-2045	OUTFALL	309.00	2.0
OFALL-2046_GP	OUTFALL	335.00	2.0
OFALL-2047	OUTFALL	307.00	1.5
OFALL-2050	OUTFALL	306.00	1.0
OFALL-206	OUTFALL	341.50	0.0
OFALL-208	OUTFALL	317.05	2.0
OFALL-210	OUTFALL	333.50	0.0
OFALL-218	OUTFALL	321.00	0.0
OFALL-222	OUTFALL	322.00	0.0
OFALL-224	OUTFALL	308.00	0.0
OFALL-226	OUTFALL	315.00	0.0
OFALL-228	OUTFALL	309.58	0.0
OFALL-232	OUTFALL	304.80	1.8
OFALL-3000_GP	OUTFALL	0.00	0.0
OFALL-3001	OUTFALL	334.50	0.5
OFALL-64	OUTFALL	285.00	0.0
OFALL-66_GP	OUTFALL	300.00	0.0
OFALL-72	OUTFALL	336.00	0.0
OFALL-74	OUTFALL	333.60	2.3
OFALL-76	OUTFALL	330.26	2.5
OFALL-78	OUTFALL	329.00	0.0
OFALL-80	OUTFALL	327.00	3.5
OFALL-82	OUTFALL	324.00	1.8
OFALL-84	OUTFALL	320.03	2.0
OFALL-86	OUTFALL	327.80	0.0
OFALL-92	OUTFALL	296.42	3.5
OFALL-94	OUTFALL	303.00	3.0
OFALL-96	OUTFALL	310.00	2.0
OFALL-98	OUTFALL	308.00	1.0
OFALL-A2801	OUTFALL	294.00	1.0
OFALL-A2802	OUTFALL	294.00	1.0

Table G-5. Future Conditions Outfalls

Junction Name	Type	Invert Elevation (ft)	Maximum Depth (ft)
OFALL-A2803	OUTFALL	294.00	1.0
OFALL-GD1	OUTFALL	282.00	0.0
OFALL-3000_EX	OUTFALL	315.00	2.0

APPENDIX H

FUTURE CONDITIONS MODEL RESULTS - JUNCTIONS AND STORAGE AREAS

Table H-1. Future Conditions Junction Criteria Exceedances and Disposition
Legend for Junctions, Dividers and Outfalls
>6 inches for longer than 72 hours – red
> 6 inches for less than 72 hours – orange

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Ground Elevation (ft)	Max HGL (ft)	HGL Above Ground (ft)	HGL Above Ground (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
JCT-1112	JUNCTION	6472923.79	1990816.6	311.36	6.64	318	320.1	2.1	25.2	375.99	22559.4	red	No separate master-plan project was identified. The result represents prolonged upstream ponding and backwater within an existing basin-controlled drainage system. Confirm junction elevations, surface-storage assumptions, basin operating levels, and planned tributary routing during project-specific design.
JCT-1126	JUNCTION	6474336.73	1989892.89	305.19	14.81	320	320.85	0.85	10.2	372.45	22347	red	No separate master-plan project was identified. The result represents prolonged upstream ponding and backwater within an existing basin-controlled drainage system. Confirm junction elevations, surface-storage assumptions, basin operating levels, and planned tributary routing during project-specific design.
JCT-1182	JUNCTION	6482190.79	1992536.34	317.86	12.14	330	330.64	0.64	7.68	373.74	22424.4	red	No separate master-plan project was identified. The result represents prolonged upstream ponding and backwater within an existing basin-controlled drainage system. Confirm junction elevations, surface-storage assumptions, basin operating levels, and planned tributary routing during project-specific design.
JCT-1184	JUNCTION	6482380.86	1992577.66	318.54	11.46	330	330.64	0.64	7.68	373.82	22429.2	red	No separate master-plan project was identified. The result represents prolonged upstream ponding and backwater within an existing basin-controlled drainage system. Confirm junction elevations, surface-storage assumptions, basin operating levels, and planned tributary routing during project-specific design.
JCT-1194	JUNCTION	6483422.06	1992850.35	321.1	8.9	330	330.88	0.88	10.56	374.53	22471.8	red	No separate project was identified because Park Place Basin shows only a transient storage exceedance; the flagged junction results represent localized upstream ponding and backwater. Confirm junction elevations, grading, and basin operation during future design review.
JCT-158_GP	JUNCTION	6457355.59	2011292.93	293.42	10.58	304	304.66	0.66	7.92	373.7	22422	red	No separate project was identified because the controlling basin improvement is already included in FCIP 3 – Foxwood Park Basin Storage Improvements, and the constrained existing basin meets the applicable Existing Conditions criteria.
JCT-160_GP	JUNCTION	6456774.65	2011234.84	291.76	12.24	304	304.54	0.54	6.48	371.2	22272	red	No separate project was identified because the controlling basin improvement is already included in FCIP 3 – Foxwood Park Basin Storage Improvements, and the constrained existing basin meets the applicable Existing Conditions criteria.
JCT-162_GP	JUNCTION	6456711.11	2011061.92	291.36	12.64	304	304.53	0.53	6.36	371.16	22269.6	red	No separate project was identified because the controlling basin improvement is already included in FCIP 3 – Foxwood Park Basin Storage Improvements, and the constrained existing basin meets the applicable Existing Conditions criteria.
JCT-164_GP	JUNCTION	6455996.74	2011127.27	289.9	14.1	304	304.53	0.53	6.36	370.89	22253.4	red	No separate project was identified because the controlling basin improvement is already included in FCIP 3 – Foxwood Park Basin Storage Improvements, and the constrained existing basin meets the applicable Existing Conditions criteria.
JCT-2240	JUNCTION	6462380.72	1989255.9	306.25	1.2	307.45	313.38	5.93	71.16	133.39	8003.4	red	No separate project was identified because the flagged HGL reflects force-main pressure at a node with no directly tributary surface area, not sustained surface flooding.
JCT-2280	JUNCTION	6478202.49	2005337.83	326.5	1.33	327.83	334.81	6.98	83.76	515.55	30933	red	No separate project was identified because the flagged HGL reflects force-main pressure at a node with no directly tributary surface area, not sustained surface flooding.
JCT-2281	JUNCTION	6477233.98	2005317.39	325	1.33	326.33	339.57	13.24	158.88	515.75	30945	red	No separate project was identified because the flagged HGL reflects force-main pressure at a node with no directly tributary surface area, not sustained surface flooding.
JCT-442	JUNCTION	6460809.32	2003868.96	304.8	4.05	308.85	315.93	7.08	84.96	444.03	26641.8	red	No separate project was identified because the inlet node uses 100 square feet of surface storage and Webb Estates Basin remains below the 72-hour duration threshold. Confirm the inlet elevation, surface-storage area, and basin operation.
JCT-700	JUNCTION	6456049.3	1997582.43	293.12	6.88	300	300.55	0.55	6.6	268.64	16118.4	red	No separate project was identified because Savannah Heights Basin shows only a transient storage exceedance; the flagged junction results are controlled by localized upstream ponding and the 100-square-foot surface-storage representation. Confirm basin operation and final grading.
JCT-702	JUNCTION	6456049.3	1997199.18	291.89	8.11	300	300.65	0.65	7.8	238.31	14298.6	red	No separate project was identified because Savannah Heights Basin shows only a transient storage exceedance; the flagged junction results are controlled by localized upstream ponding and the 100-square-foot surface-storage representation. Confirm basin operation and final grading.
JCTN-24	JUNCTION	6484123.424	1997906.5	326.6	11	337.6	341.12	3.52	42.24	372.52	22351.2	red	No City FCIP was identified because the condition is within the Stonebridge subdivision storage system and should be resolved through subdivision-specific grading, storage, and outlet design.
JCT-01vista_GP	JUNCTION	6486157.42	1998409.22	326.78	13.22	340	346.43	6.43	77.16	0.2	12	orange	No separate Future Conditions project was identified because the controlling hydraulic connection is addressed by Existing Conditions CIP 3 – Kiwanis Park Basin and Wet Well Improvements; the residual exceedance is brief.
JCT-1010	JUNCTION	6468204.24	1995871.93	310.3	5	315.3	315.88	0.58	6.96	14.73	883.8	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-1016	JUNCTION	6471738.94	1993147.57	307.98	8.41	316.39	316.91	0.52	6.24	7.28	436.8	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-1018	JUNCTION	6471758.51	1993602.41	308.48	7.72	316.2	317.28	1.08	12.96	29.73	1783.8	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-1044	JUNCTION	6473298.4	1994527.67	314.05	7.95	322	322.61	0.61	7.32	19.81	1188.6	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-1062	JUNCTION	6464009.41	1993032.51	303.43	6.47	309.9	311.03	1.13	13.56	1.59	95.4	orange	No separate project was identified because the result reflects force-main or pump-discharge pressure interacting with the modeled surface-storage setting, not an independent gravity-system deficiency.
JCT-1096	JUNCTION	6466599.03	1993068.95	305.67	7.83	313.5	314.01	0.51	6.12	12.27	736.2	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-1118	JUNCTION	6474719.9	1991240.82	309.87	12.13	322	322.85	0.85	10.2	0.02	1.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-1122	JUNCTION	6476259.42	1990193.95	310.35	11.65	322	322.59	0.59	7.08	1.53	91.8	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-1262	JUNCTION	6486826.47	1995714.49	325.45	12.55	338	340.35	2.35	28.2	3.21	192.6	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-1398	JUNCTION	6462534.25	1989221.47	302.26	3.94	306.2	309.37	3.17	38.04	8.76	525.6	orange	No separate project was identified because the result reflects force-main or pump-discharge pressure interacting with the modeled surface-storage setting, not an independent gravity-system deficiency.
JCT-2009	JUNCTION	6479638.71	2005018.85	322.13	11.71	333.84	334.79	0.95	11.4	0.35	21	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and is sensitive to the planning-level 1,000-square-foot surface-storage representation.
JCT-2017_GP	JUNCTION	6479117.64	1993871.09	317.55	10.55	328.1	328.7	0.6	7.2	0.16	9.6	orange	No separate project was identified because the controlling basin improvement is already included in FCIP 21 – Burke Street North Basin Partial Expansion Improvements, which meets the applicable Existing Conditions criteria.
JCT-2018_GP	JUNCTION	6478819.22	1993811.91	317.53	10.47	328	328.63	0.63	7.56	0.09	5.4	orange	No separate project was identified because the controlling basin improvement is already included in FCIP 21 – Burke Street North Basin Partial Expansion Improvements, which meets the applicable Existing Conditions criteria.

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Ground Elevation (ft)	Max HGL (ft)	HGL Above Ground (ft)	HGL Above Ground (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
JCT-2019_GP	JUNCTION	6478523.21	1993792.38	317.47	10.43	327.9	328.46	0.56	6.72	0.09	5.4	orange	No separate project was identified because the controlling basin improvement is already included in FCIP 21 – Burke Street North Basin Partial Expansion Improvements, which meets the applicable Existing Conditions criteria.
JCT-2020	JUNCTION	6487522.53	1995704.53	323.87	15.93	339.8	340.57	0.77	9.24	0.47	28.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2058	JUNCTION	6487687.55	1995702.89	326.04	14.06	340.1	340.66	0.56	6.72	0.4	24	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2079	JUNCTION	6461270.4	2007707.44	295.88	14.27	310.15	310.71	0.56	6.72	30.14	1808.4	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-2095	JUNCTION	6445029.15	2003182.01	274.93	11.87	286.8	288.31	1.51	18.12	0.19	11.4	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2104_GP	JUNCTION	6475190.46	2014110.58	316.24	15.43	331.67	332.3	0.63	7.56	0.17	10.2	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2111_GP	JUNCTION	6471649.78	2014578.28	311.21	11.29	322.5	323.48	0.98	11.76	3.51	210.6	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2121_GP	JUNCTION	6469128.29	2011466.73	309.74	12.42	322.16	323.36	1.2	14.4	7.63	457.8	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2122_GP	JUNCTION	6469130.85	2011598.54	309.47	12.67	322.14	323.55	1.41	16.92	7.18	430.8	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2123_GP	JUNCTION	6469141.38	2011882.91	308.91	13.42	322.33	323.78	1.45	17.4	2.5	150	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2139	JUNCTION	6455490.07	2008959.7	290.31	11.91	302.22	303.22	1	12	0.35	21	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2154	JUNCTION	6464685.69	2007254.35	303.75	7.25	311	312.24	1.24	14.88	27.25	1635	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-2157_GP	JUNCTION	6470833.82	1989332.6	304.67	11.04	315.71	316.28	0.57	6.84	0.09	5.4	orange	No separate project was identified because the controlling improvements are already included in FCIP 7 – Hillsdale Basin and Shirk Road Storm Drain Improvements, and the residual exceedance is brief.
JCT-2164	JUNCTION	6479632.71	2005018.83	322.1	11.5	333.6	334.7	1.1	13.2	0.36	21.6	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and is sensitive to the planning-level 1,000-square-foot surface-storage representation.
JCT-2168	JUNCTION	6481355.8	2006386.2	329.18	5.82	335	343.18	8.18	98.16	18.96	1137.6	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2180	JUNCTION	6478212.13	2004628.21	319.09	12.41	331.5	332.03	0.53	6.36	0.4	24	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-2189	JUNCTION	6477228.75	2005666.98	324	1.33	325.33	375.33	50	600	0.01	0.6	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2190	JUNCTION	6478203.74	2005319.24	326.5	1.33	327.83	334.54	6.71	80.52	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2191	JUNCTION	6478206.87	2005002.26	322.5	1.33	323.83	333.55	9.72	116.64	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2192	JUNCTION	6478208.29	2004841.96	325.5	1.33	326.83	333.5	6.67	80.04	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2193	JUNCTION	6478223.98	2004501.32	325.5	1.33	326.83	332.92	6.09	73.08	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2194	JUNCTION	6478228.53	2004423.82	328	1.33	329.33	333.29	3.96	47.52	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2195	JUNCTION	6478238.39	2004397.61	325.5	6.5	332	332.58	0.58	6.96	0.02	1.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2215	JUNCTION	6480608.01	1996556.69	323.46	9.29	332.75	333.35	0.6	7.2	0.16	9.6	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2216_GP	JUNCTION	6486201.32	1999656.11	332.18	7.09	339.27	346.05	6.78	81.36	0.16	9.6	orange	No separate Future Conditions project was identified because the controlling hydraulic connection is addressed by Existing Conditions CIP 3 – Kiwanis Park Basin and Wet Well Improvements; the residual exceedance is brief.
JCT-2217_GP	JUNCTION	6486206.31	1999150.72	323	16.9	339.9	342.4	2.5	30	0.11	6.6	orange	No separate Future Conditions project was identified because the controlling hydraulic connection is addressed by Existing Conditions CIP 3 – Kiwanis Park Basin and Wet Well Improvements; the residual exceedance is brief.
JCT-2219	JUNCTION	6471230.13	1990364.92	308.95	9.12	318.07	318.85	0.78	9.36	1.87	112.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-2222_GP	JUNCTION	6471050.67	2014212.96	306.82	14.18	321	322.21	1.21	14.52	3.37	202.2	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2223_GP	JUNCTION	6470757.94	2014383.92	306.44	13.96	320.4	321.62	1.22	14.64	4.07	244.2	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2224_GP	JUNCTION	6470482.74	2014583.59	306.07	13.73	319.8	321.06	1.26	15.12	8.15	489	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2226_GP	JUNCTION	6469874.55	2014840.79	305.25	13.95	319.2	319.98	0.78	9.36	12.42	745.2	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-2228	JUNCTION	6457158.19	2004408.41	300	0.67	300.67	351.28	50.61	607.32	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2229	JUNCTION	6457195.32	2003917.4	301	0.67	301.67	313.26	11.59	139.08	0	0	orange	No separate project was identified because the node is within a closed force main with no modeled surface-storage area; the high HGL represents system pressure.
JCT-2243	JUNCTION	6485396.61	2002164.09	345	0.5	345.5	452.9	107.4	1288.8	59.85	3591	orange	No separate project was identified because the result reflects force-main or pump-discharge pressure interacting with the modeled surface-storage setting, not an independent gravity-system deficiency.
JCT-2244	JUNCTION	6485375.94	2002193.52	344.97	0.5	345.47	444.13	98.66	1183.92	59.83	3589.8	orange	No separate project was identified because the result reflects force-main or pump-discharge pressure interacting with the modeled surface-storage setting, not an independent gravity-system deficiency.
JCT-2245	JUNCTION	6484885.02	2002127.24	344.53	0.5	345.03	393.97	48.94	587.28	60.01	3600.6	orange	No separate project was identified because the result reflects force-main or pump-discharge pressure interacting with the modeled surface-storage setting, not an independent gravity-system deficiency.
JCT-2246	JUNCTION	6484853.2	2002095.41	344.5	0.5	345	389.25	44.25	531	60.04	3602.4	orange	No separate project was identified because the result reflects force-main or pump-discharge pressure interacting with the modeled surface-storage setting, not an independent gravity-system deficiency.
JCT-2288	JUNCTION	6478269.1	2009601.6	322.64	6.37	329.01	336.11	7.1	85.2	5	300	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and is sensitive to the planning-level 1,000-square-foot surface-storage representation.

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Ground Elevation (ft)	Max HGL (ft)	HGL Above Ground (ft)	HGL Above Ground (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
JCT-232	JUNCTION	6483955.1	2008209.67	334.25	5.75	340	340.51	0.51	6.12	15.43	925.8	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-234	JUNCTION	6483948.98	2007958.59	334.77	5.23	340	340.52	0.52	6.24	15.51	930.6	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-302_GP	JUNCTION	6477493.16	2012500.47	327.81	5.88	333.69	338.31	4.62	55.44	4.46	267.6	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3109_GP	JUNCTION	6476907.72	2009830.11	324.66	4	328.66	329.25	0.59	7.08	2.11	126.6	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3110_GP	JUNCTION	6476912.51	2009672.05	324.3	4	328.3	329.05	0.75	9	19.12	1147.2	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3111_GP	JUNCTION	6476902.93	2009514	324.54	4	328.54	329.44	0.9	10.8	7.61	456.6	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3112_GP	JUNCTION	6476907.72	2009327.21	324.81	4	328.81	330.07	1.26	15.12	0.37	22.2	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3113_GP	JUNCTION	6477104.09	2009672.05	323.99	4	327.99	328.66	0.67	8.04	26.21	1572.6	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3114_GP	JUNCTION	6477310.05	2009614.58	323.7	4	327.7	328.66	0.96	11.52	31.04	1862.4	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3115_GP	JUNCTION	6477803.37	2009609.79	322.95	4	326.95	328.65	1.7	20.4	41.2	2472	orange	No separate project was identified because the controlling improvements are already included in FCIP 28 – South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-3116_GP	JUNCTION	6488016.36	2010286.4	335	0.5	335.5	374.4	38.9	466.8	0	0	orange	No separate project was identified because the node is within FCIP 4 – River Run Ranch Basin West Pump Improvements and represents force-main/pump-discharge pressure rather than surface flooding.
JCT-3117_GP	JUNCTION	6488071.97	2009395.39	342.42	0.5	342.92	642.92	300	3600	0.01	0.6	orange	No separate project was identified because the node is within FCIP 4 – River Run Ranch Basin West Pump Improvements and represents force-main/pump-discharge pressure rather than surface flooding.
JCT-370	JUNCTION	6458638.3	2007735.12	299.18	6.25	305.43	308.98	3.55	42.6	8.42	505.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-390	JUNCTION	6462614.5	2003572.32	300.89	7.49	308.38	309.19	0.81	9.72	39.54	2372.4	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-446	JUNCTION	6459987.11	2002983.99	303.01	5.7	308.71	348.8	40.09	481.08	4.96	297.6	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-462_GP	JUNCTION	6461242.68	2013107.93	298.19	13.81	312	315.98	3.98	47.76	0.25	15	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-486	JUNCTION	6471691.81	2004040.81	318.85	5.15	324	429.86	105.86	1270.32	8.59	515.4	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-60_GP	JUNCTION	6465121.65	2016349.05	305.63	10	315.63	316.3	0.67	8.04	60.05	3603	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-62_GP	JUNCTION	6464980.53	2015513.04	302.76	12	314.76	316.37	1.61	19.32	51.52	3091.2	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JCT-634	JUNCTION	6478271.13	2010159.51	322.19	13.01	335.2	336.05	0.85	10.2	0.85	51	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-750	JUNCTION	6457291.99	2001056.8	276	28	304	305.07	1.07	12.84	0.07	4.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-868	JUNCTION	6479956.64	2001109.29	325.95	6.05	332	332.68	0.68	8.16	23.75	1425	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-886	JUNCTION	6480295.91	1996564.36	323.3	8.9	332.2	333.34	1.14	13.68	0.18	10.8	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-922	JUNCTION	6460635.84	1995261.51	295.59	9.11	304.7	305.66	0.96	11.52	0.2	12	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-972	JUNCTION	6463518.88	1989292.08	301.25	5.35	306.6	307.71	1.11	13.32	1.62	97.2	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-974	JUNCTION	6463019.65	1989271.95	301.7	5.44	307.14	308.22	1.08	12.96	2.08	124.8	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-978	JUNCTION	6459453.75	1989273.2	285.78	16.22	302	302.62	0.62	7.44	37.41	2244.6	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
JCT-984	JUNCTION	6458716.29	1989280.03	287.4	14.6	302	320.76	18.76	225.12	42.45	2547	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
JCT-988	JUNCTION	6462664.53	1989236	302.02	4.17	306.19	308.81	2.62	31.44	5.65	339	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and is sensitive to the planning-level 1,000-square-foot surface-storage representation.
JG-14	JUNCTION	6461908.02	2007761.03	295.47	14.53	310	310.85	0.85	10.2	32.89	1973.4	orange	No separate project was identified because the exceedance is localized and clears within 72 hours. Confirm the final junction elevation and surface grading during project-specific design.
islandOaks1_GP	JUNCTION	6477456.746	2012401.038	330.03	4	334.03	337.45	3.42	41.04	4.2	252	orange	No separate project was identified because the node is within the modeled drainage system evaluated with FCIP 1S – Modoc Basin Storage Improvements; the residual exceedance is localized and clears within 72 hours.
JOFALL-68	JUNCTION	6459993.837	2003391.566	301.07	7	308.07	326.69	18.62	223.44	4.64	278.4	orange	No separate project was identified because the exceedance is brief at a plan-based connection to the downstream pump wet-well system and is sensitive to the modeled surface-storage representation.
JCTN-23	JUNCTION	6459983.972	2003751.617	300.92	7.5	308.42	315.73	7.31	87.72	3	180	orange	No separate project was identified because the exceedance is brief at a plan-based connection to the downstream pump wet-well system and is sensitive to the modeled surface-storage representation.
DIV-10	DIVIDER	6471702.88	2004040.71	318.9	5.1	324	424.25	100.25	1203	8.46	507.6	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
DIV-16	DIVIDER	6475208.76	2005942.57	326.93	2	328.93	329.74	0.81	9.72	2.45	147	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.
DIV-50	DIVIDER	6480910.5	1997931.32	328.8	2.5	331.3	333.24	1.94	23.28	0.59	35.4	orange	No separate project was identified because the exceedance is localized, clears within 72 hours, and occurs at a node represented with 100 square feet of surface storage.

Table H-2. Future Conditions Storage-Node Criteria Exceedances and Disposition
Legend for Storage Nodes
Above top of basin longer than 72 hours - red
Above top of basin less than 72 hrs - orange

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Modeled Top Elevation (ft)	Max HGL (ft)	HGL Above Modeled Top (ft)	HGL Above Modeled Top (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
STOR-212	STORAGE	6484324	1997858	326.3	8.55	334.85	339.85	5	60	83.55	5013	red	No City FCIP was identified because these are Stonebridge subdivision storage facilities; resolve the condition through subdivision-specific grading, storage, and outlet design.
STOR-213	STORAGE	6484098	1997400	327.88	6.97	334.85	339.85	5	60	109.07	6544.2	red	No City FCIP was identified because these are Stonebridge subdivision storage facilities; resolve the condition through subdivision-specific grading, storage, and outlet design.
STO-G1	STORAGE	6461545.9	2007552.1	290	16.5	306.5	311.5	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-112	STORAGE	6477363.3	2005748.9	304.67	20.33	325	326.2	1.2	14.4	0	0	orange	No separate project was identified because the result occurs within the model's storage-node surcharge allowance rather than as a calculated overflow volume. Confirm the physical basin top elevation and overflow path during future design or model updates.
STOR-210	STORAGE	6481265	2006446	329.81	5.5	335.31	340.31	5	60	0.38	22.8	orange	No separate project was identified because the exceedance is short-duration and occurs within the model's storage-node surcharge allowance. Confirm the basin top elevation, stage-storage relationship, and outlet operation during future design review.
STOR-22_GP	STORAGE	6456158.3	2010994.7	267	35.46	302.46	307.46	5	60	0.01	0.6	orange	No separate project was identified because the basin improvement is already included in FCIP 3 – Foxwood Park Basin Storage Improvements; the exceedance is transient and the constrained existing basin meets the applicable Existing Conditions criteria.
STOR-224	STORAGE	6443916	2005209	265.29	17	282.29	287.09	4.8	57.6	0	0	orange	No separate project was identified because the result occurs within the model's storage-node surcharge allowance rather than as a calculated overflow volume. Confirm the physical basin top elevation and overflow path during future design or model updates.
STOR-227	STORAGE	6463433.5	2002592.2	305.79	4.5	310.29	315.29	5	60	0.03	1.8	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-24	STORAGE	6440271.5	2007419.5	253.5	28.5	282	287	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-251	STORAGE	6462654.9	1996739.4	300	10	310	310.07	0.07	0.84	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-252	STORAGE	6449380.8	2002538.3	276	13	289	289.02	0.02	0.24	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-257	STORAGE	6475171.4	2004248.1	311	13	324	327.97	3.97	47.64	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-265	STORAGE	6466549.5	1997419.8	303.4	13.1	316.5	321.5	5	60	9.96	597.6	orange	The flagged wet-well condition is addressed by Existing Conditions CIP 1; no additional Future Conditions project was identified.
STOR-273	STORAGE	6459997.8	2003831.5	299.03	10.97	310	315	5	60	0.68	40.8	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the exceedance is a brief surcharge condition.
STOR-274	STORAGE	6463999.3	1993059.9	294.46	15.44	309.9	314.9	5	60	0.01	0.6	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the exceedance is a brief surcharge condition.
STOR-276	STORAGE	6472364.4	1998848.3	313.6	13.4	327	327.39	0.39	4.68	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-279	STORAGE	6461518.6	2007361.8	290.7	20.3	311	316	5	60	0.01	0.6	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the exceedance is a brief surcharge condition.
STOR-281	STORAGE	6457301.2	2001036.4	273.75	29.25	303	308	5	60	0.01	0.6	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the exceedance is a brief surcharge condition.
STOR-283	STORAGE	6479549.9	2011689.2	326	20	346	346.04	0.04	0.48	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-284	STORAGE	6457077.7	2004557.2	288.5	14.5	303	304.61	1.61	19.32	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-288	STORAGE	6485400.9	2002194.1	339	9.8	348.8	353.8	5	60	0.01	0.6	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the exceedance is a brief surcharge condition.
STOR-289	STORAGE	6462009.6	1998945.5	300	10.75	310.75	310.76	0.01	0.12	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-291	STORAGE	6479523.8	1999827.1	312.88	22.12	335	335.68	0.68	8.16	0	0	orange	No separate project was identified because this model storage node is a pump wet well, not a basin, and the results show no surface overflow.
STOR-321_GP	STORAGE	6478108.8	1994538.3	300	25.2	325.2	330.2	5	60	0.03	1.8	orange	No separate project was identified because the storage facility is evaluated with FCIP 21 – Burke Street North Basin Partial Expansion Improvements, which meets the applicable Existing Conditions criteria.
STOR-34_GP	STORAGE	6477608	2012688.8	325.85	5.97	331.82	336.82	5	60	1.45	87	orange	No separate Island Oaks Basin modification is included in FCIP 1S. The modeled exceedance is short-duration within the connected Modoc drainage system; confirm the Island Oaks Basin stage-storage relationship and outlet controls during final design.
STOR-38	STORAGE	6457060	2004608.6	291.87	10.43	302.3	304.63	2.33	27.96	0	0	orange	No separate project was identified because the result occurs within the model's storage-node surcharge allowance rather than as a calculated overflow volume. Confirm the physical basin top elevation and overflow path during future design or model updates.
STOR-50	STORAGE	6460517.1	2003847.5	303.9	4.6	308.5	313.5	5	60	36.5	2190	orange	No separate basin project was identified because the modeled exceedance clears within 72 hours and is influenced by the storage-node surcharge representation. Confirm the basin top elevation, inlet grading, stage-storage relationship, and outlet operation during future design review.
STOR-58	STORAGE	6485582.1	2004343.1	326.21	12.35	338.56	339.77	1.21	14.52	0	0	orange	No separate project was identified because the result occurs within the model's storage-node surcharge allowance rather than as a calculated overflow volume. Confirm the physical basin top elevation and overflow path during future design or model updates.
STOR-60_GP	STORAGE	6455413.5	1997386.4	279.3	20.7	300	305	5	60	0.01	0.6	orange	No separate basin project was identified because the modeled exceedance is limited to a brief modeled exceedance with negligible overflow volume; the long-duration upstream junction results are documented separately.
STOR-66	STORAGE	6457209.8	2000972.6	275	26	301	306	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-74	STORAGE	6479160.6	2000331.1	316.5	14.5	331	336	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-78	STORAGE	6482475.7	1995498	319	11	330	335	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-80	STORAGE	6459713.4	1999939.6	300	7.99	307.99	312.99	5	60	0.01	0.6	orange	No separate project was identified because the exceedance is limited to a brief modeled exceedance with negligible overflow volume.
STOR-86	STORAGE	6474145.1	1990033.2	299	17.5	316.5	321.5	5	60	0.01	0.6	orange	No separate basin project was identified because the modeled storage exceedance is limited to a brief modeled exceedance with negligible overflow volume; the long-duration upstream junction results are documented separately.
STOR-88	STORAGE	6482361.2	1992986.9	307.89	20.62	328.51	333.51	5	60	0.01	0.6	orange	No separate basin project was identified because the modeled storage exceedance is limited to a brief modeled exceedance with negligible overflow volume; the long-duration upstream junction results are documented separately.
STOR-94_GP	STORAGE	6478140.8	1993384.9	302	24	326	327.66	1.66	19.92	0	0	orange	No separate project was identified because the storage facility is evaluated with FCIP 21 – Burke Street North Basin Partial Expansion Improvements, which meets the applicable Existing Conditions criteria.

Node ID	Node Type	X Coord	Y Coord	Invert Elevation (ft)	Max Depth	Modeled Top Elevation (ft)	Max HGL (ft)	HGL Above Modeled Top (ft)	HGL Above Modeled Top (in.)	Duration of flooding (hrs)	Duration of flooding (mins)	Color Code	Disposition
STOR-CameronCreek_N	STORAGE	6489297.7	1995104.9	310	22	332	337	5	60	17.21	1032.6	orange	No project was identified because this is a conceptual planning-level storage node and is not the storage basin represented by FCIP 24 – Cameron Creek North/Future Southeast Growth Area Storm Drain and Basin Improvements.

APPENDIX I

EXISTING CAPITAL IMPROVEMENT PROJECTS - CUT SHEETS

Project Number: CIP#1
Project Name: S County Center Dr Wet Well & Evans Ditch Overflow Upgrade
Project Description:

The intersection of South County Center Drive and West Walnut Avenue experiences flooding during storm events due to limited wet well/sump storage and the absence of a relief overflow to Evans Ditch. CIP #1 proposes modifying the existing pump sump/wet well to increase available storage area and constructing approximately 15 LF of 24-inch RCP overflow pipe from the wet well to Evans Ditch. A flap gate is included to prevent irrigation ditch flows from entering the storm drain system. These improvements provide an emergency overflow path to Evans Ditch while maintaining the existing pumped discharge configuration. The project is intended to reduce the duration and volume of flooding at the South County Center Drive and West Walnut Avenue intersection during the design storm event.

Project Detail:

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	23,300	23,300	7,000	30,300	8,400	38,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	400	1,500	500	2,000
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	900	3,700	1,100	4,800
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch Overflow RCP	15	LF	300	4,500	1,400	5,900	1,700	7,600
Modify Existing Pump Sump / Wet Well	1	LS	199,100	199,100	59,800	258,900	71,200	330,100
Grand Total				$255,800	$77,000	$332,800	$91,900	$424,700

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Capital Improvement Cost does not include costs for land acquisition, easements, or ROW acquisition.

(7) Cost of permits, if required, have not been included in construction estimate

Project Number: CIP#2
Project Name: N. McAuliff Street Storm Drain Replacement between Houston & Douglas
Project Description:

A pipe size reduction along North McAuliff Street causes recurring debris blockages and localized flooding at the Houston Avenue and McAuliff Street intersection, a major roadway corridor. CIP #2 is a pipe replacement project along North McAuliff Street between Houston Avenue and Douglas Avenue. The existing storm drain system currently transitions from a 24-inch pipe to a smaller 15-inch pipe, creating a bottleneck where debris can accumulate and restrict flow. The proposed improvement replaces approximately 840 LF of existing 15-inch storm drain with 24-inch RCP to match the upstream pipe size, remove the restrictive transition, and improve conveyance through this corridor. The project is intended to reduce localized flooding and improve drainage performance at the Houston Avenue and McAuliff Street intersection.

Project Detail:

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	28,100	28,100	8,500	36,600	10,100	46,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	400	1,500	500	2,000
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	900	3,700	1,100	4,800
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Remove and Replace Existing Pipe with 24-inch RCP	840	LF	300	252,000	75,600	327,600	90,100	417,700
Grand Total				$309,000	$92,900	$401,900	$110,800	$512,700

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Capital Improvement Cost does not include costs for land acquisition, easements, or ROW acquisition.

(7) Cost of permits, if required, have not been included in construction estimate

Project Number: CIP#3
Project Name: Kiwanis Park Basin and Wet Well Improvements
Project Description:

Existing CIP #3 is a Kiwanis Park Basin and wet well improvement project. The project includes lowering/replacing approximately 50 LF of 36-inch RCP between the Kiwanis Park storage basin and the downstream pump wet well, along with modifications to deepen or replace the existing wet well. The existing pump discharge configuration is maintained, and the optional pump capacity upgrade is excluded from the base cost estimate. This project is intended to improve the hydraulic connection between the existing Kiwanis Park storage basin and wet well so the basin can drain more effectively and better use its available storage volume. Per City direction, this project is treated as an Existing CIP rather than a Future CIP because the improvements address existing infrastructure and existing drainage areas. Future trunkline extensions and future basin expansion elements are not included in this cost estimate.

Project Detail:

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	24,700	24,700	7,500	32,200	8,900	41,100
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	400	1,500	500	2,000
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	900	3,700	1,100	4,800
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Lower/replace 36-inch RCP from Kiwanis pond to wet wel	50	LF	370	18,500	5,600	24,100	6,700	30,800
Modify / deepen existing Kiwanis wet well	1	LS	199,100	199,100	59,800	258,900	71,200	330,100
Grand Total				$271,200	$81,700	$352,900	$97,400	$450,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Capital Improvement Cost does not include costs for land acquisition, easements, or ROW acquisition.

(7) Cost of permits, if required, have not been included in construction estimate

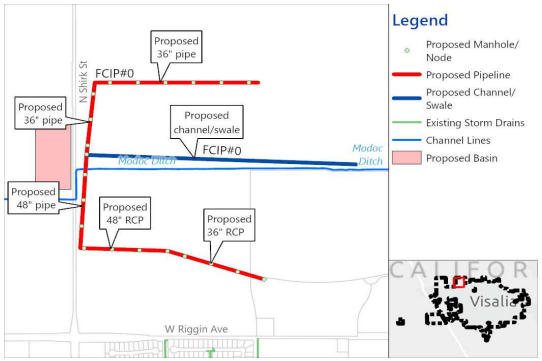
APPENDIX J

FUTURE CAPITAL IMPROVEMENT PROJECTS - CUT SHEETS

Project Number: FCIP#0
Project Name: Carlton Acres Storm Drain and Basin Improvements
Project Description:

Future CIP #0 is a proposed storm drain conveyance and storage project serving the planned Carlton Acres development area. The project includes approximately 7,650 LF of new/proposed storm drain trunkline improvements, including approximately 4,950 LF of 36-inch RCP and 2,700 LF of 48-inch RCP. The project also includes approximately 20 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard and pipe size-change requirement, 2 basin inlet/outlet structures, approximately 5,800 CY of trapezoidal drainage swale/channel construction, and approximately 298,400 CY of storage basin excavation for the Carlton Acres storage basin. The modeled basin provides approximately 185 ac-ft of modeled storage capacity. The proposed improvements collect and convey runoff from the planned development area to the storage basin and provide dedicated storage to reduce future-condition flooding within the development drainage system.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	1,689,100	1,689,100	506,700	2,195,800	603,800	2,799,600
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	4,950	LF	370	1,831,500	549,500	2,381,000	654,800	3,035,800
Construct 48-inch RCP Storm Drain	2,700	LF	560	1,512,000	453,600	1,965,600	540,500	2,506,100
Construct Storm Drain Manhole / Junction Structure	20	EA	16,000	320,000	96,000	416,000	114,400	530,400
Construct Basin Inlet / Outlet Structure	2	EA	32,000	64,000	19,200	83,200	22,900	106,100
Storage Basin Excavation / Regrading	298,400	CY	33	9,847,200	2,954,200	12,801,400	3,520,400	16,321,800
Construct Trapezoidal Drainage Swale / Channel	5,800	CY	33	191,400	57,400	248,800	68,400	317,200
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	14	AC	150,000	2,133,200	640,000	2,773,200	762,600	3,535,800
Perimeter Fencing	3,190	LF	56	178,600	53,600	232,200	63,900	296,100
Perimeter Landscaping	48,750	SF	6	292,500	87,800	380,300	104,600	484,900
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,675	LF	232	388,600	116,600	505,200	138,900	644,100
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 18,579,800	$ 5,574,100	$ 24,153,900	$ 6,642,400	$ 30,796,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

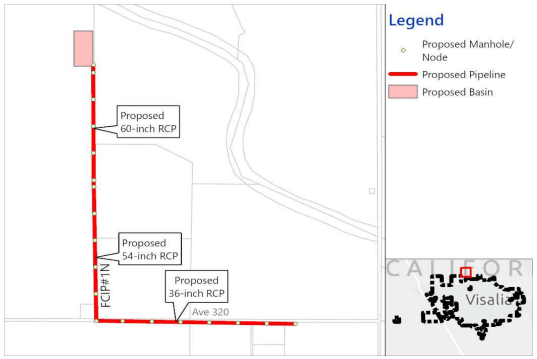
Project Number: FCIP#1N

Project Name: Avenue 320 and Linwood Street Storm Drain and Basin Improvements

Project Description:

Future CIP #1N is a proposed storm drain conveyance and storage basin project serving the future growth area near Avenue 320 and Linwood Street, north of Avenue 320. The project includes approximately 6,550 LF of new/proposed storm drain trunkline improvements, including approximately 2,750 LF of 36-inch RCP, 2,100 LF of 54-inch RCP, and 1,700 LF of 60-inch RCP. No existing storm drain infrastructure is replaced as part of this FCIP. The proposed storm drain segments convey future runoff to the proposed storage basin, with the 60-inch segment providing the proposed basin connection. The project also includes approximately 18 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard and pipe size-change requirement, 1 basin inlet/outlet structure, and approximately 82,800 CY of storage basin excavation for the proposed standalone basin north of Avenue 320. The modeled basin provides approximately 51 ac-ft of modeled storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the storage basin and provide dedicated storage to reduce future-condition flooding in the Avenue 320 and Linwood Street drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	815,700	815,700	244,700	1,060,400	291,600	1,352,000
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	2,750	LF	370	1,017,500	305,300	1,322,800	363,800	1,686,600
Construct 54-inch RCP Storm Drain	2,100	LF	670	1,407,000	422,100	1,829,100	503,000	2,332,100
Construct 60-inch RCP Storm Drain	1,700	LF	840	1,428,000	428,400	1,856,400	510,500	2,366,900
Construct Storm Drain Manhole / Junction Structure	18	EA	16,000	288,000	86,400	374,400	103,000	477,400
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	82,800	CY	33	2,732,400	819,700	3,552,100	976,800	4,528,900
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	4	AC	150,000	651,800	195,500	847,300	233,000	1,080,300
Perimeter Fencing	1,698	LF	56	95,100	28,500	123,600	34,000	157,600
Perimeter Landscaping	26,370	SF	6	158,200	47,500	205,700	56,600	262,300
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	929	LF	232	215,500	64,700	280,200	77,100	357,300
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 8,972,900	$ 2,691,900	$ 11,664,800	$ 3,208,000	$ 14,872,800

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

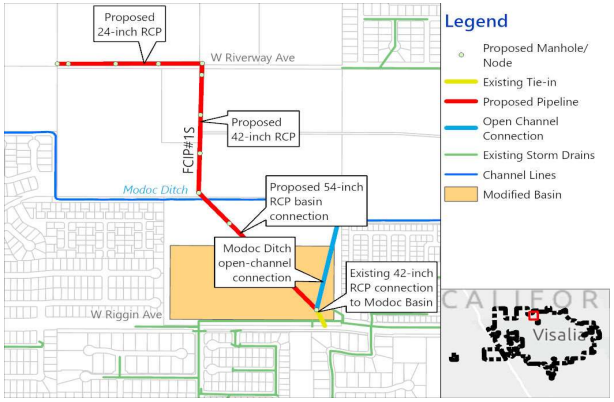
(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#1S
Project Name: Modoc Basin Storage Improvements
Project Description:

Future CIP #1S is a proposed storm drain conveyance and storage improvement project serving the Modoc drainage area near the existing Modoc Basin north of W Riggin Avenue and south of Modoc Ditch, generally between N Kent Street and N Fontana Court. The project includes approximately 3,700 LF of planned/proposed storm drain improvements, including approximately 1,350 LF of 24-inch RCP, 1,300 LF of 42-inch RCP, 250 LF of 48-inch RCP, and 800 LF of 54-inch RCP. The project also includes approximately 7 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard, 4 concrete junction structures, and 2 basin inlet/outlet structures. Together, the storm drain manholes/junction structures and concrete junction structures provide approximately 11 total junction-type structures for the proposed storm drain improvements. The project includes approximately 743,600 CY of storage basin excavation/regrading for the existing Modoc Basin. During the design event, the modified Modoc Basin stores approximately 461 ac-ft of modeled runoff. The proposed improvements increase conveyance and storage capacity for future runoff tributary to the Modoc drainage system, with the basin improvements lowering and regrading the existing Modoc Basin to increase available storage volume.

Project Detail:



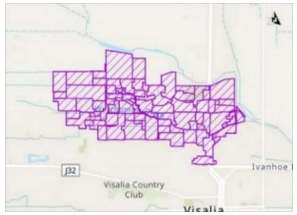
Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	2,650,400	2,650,400	795,100	3,445,500	947,500	4,393,000
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	1,350	LF	300	405,000	121,500	526,500	144,800	671,300
Construct 42-inch RCP Storm Drain	1,300	LF	410	533,000	159,900	692,900	190,500	883,400
Construct 48-inch RCP Storm Drain	250	LF	560	140,000	42,000	182,000	50,100	232,100
Construct 54-inch RCP Storm Drain	800	LF	670	536,000	160,800	696,800	191,600	888,400
Construct Storm Drain Manhole / Junction Structure	7	EA	16,000	112,000	33,600	145,600	40,000	185,600
Construct Concrete Junction Structure	4	EA	16,000	64,000	19,200	83,200	22,900	106,100
Construct Basin Inlet / Outlet Structure	2	EA	32,000	64,000	19,200	83,200	22,900	106,100
Storage Basin Excavation / Regrading	743,600	CY	33	24,538,800	7,361,600	31,900,400	8,772,600	40,673,000
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Grand Total				$ 29,153,900	$ 8,746,100	$ 37,900,000	$ 10,422,600	$ 48,322,600

Notes:

(1) Costs based on project size
(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350
(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.
(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.
(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.
(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

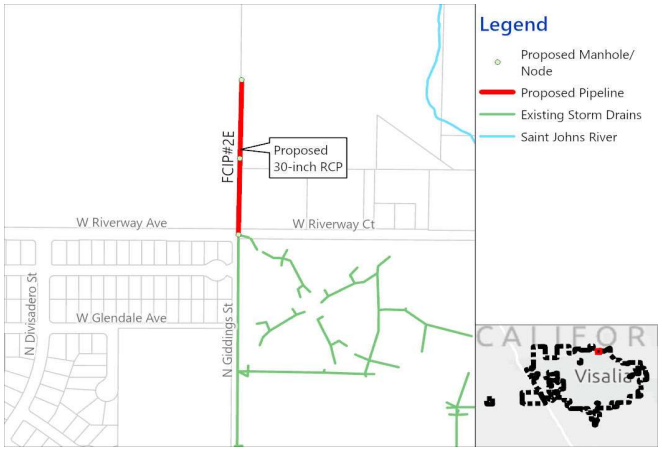


Project Number: FCIP#2E
Project Name: North Giddings Street Storm Drain Improvements

Project Description:

Future CIP #2E is a proposed storm drain conveyance improvement along North Giddings Street, south of the St. Johns River. The project includes approximately 800 LF of new/proposed 30-inch RCP. The project also includes approximately 2 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard and 1 tie-in to the downstream existing 30-inch storm drain system. The proposed improvement provides a storm drain connection for runoff from the tributary area and routes flows south toward the downstream existing 30-inch storm drain system. Some residual flooding may remain because the downstream existing storm drain system becomes the controlling constraint.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	34,400	34,400	10,300	44,700	12,300	57,000
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 30-inch RCP Storm Drain	800	LF	340	272,000	81,600	353,600	97,200	450,800
Construct Storm Drain Manhole / Junction Structure	2	EA	16,000	32,000	9,600	41,600	11,400	53,000
Tie-In to Existing Storm Drain / Existing Utility	1	EA	10,900	10,900	3,300	14,200	3,900	18,100
Grand Total				$ 378,200	$ 113,400	$ 491,600	$ 135,200	$ 626,800

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#2W

Project Name: Mooney Boulevard and Riverway Drive Storm Drain Improvements

Project Description:

Future CIP #2W is a proposed storm drain conveyance connection improvement near Mooney Boulevard and Riverway Drive. The project includes approximately 1,500 LF of new/proposed 36-inch RCP storm drain. The project also includes approximately 4 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard and 1 tie-in to the downstream existing 36-inch storm drain system. The proposed improvement provides a point of connection for runoff from the tributary area and routes flows south toward the downstream existing storm drain system. Some residual flooding may remain because the downstream existing storm drain system is the controlling constraint.

Project Detail:

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	65,900	65,900	19,800	85,700	23,600	109,300
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	1,500	LF	370	555,000	166,500	721,500	198,400	919,900
Construct Storm Drain Manhole / Junction Structure	4	EA	16,000	64,000	19,200	83,200	22,900	106,100
Tie-In to Existing Storm Drain / Existing Utility	1	EA	10,900	10,900	3,300	14,200	3,900	18,100
Grand Total				$ 724,700	$ 217,400	$ 942,100	$ 259,200	$ 1,201,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

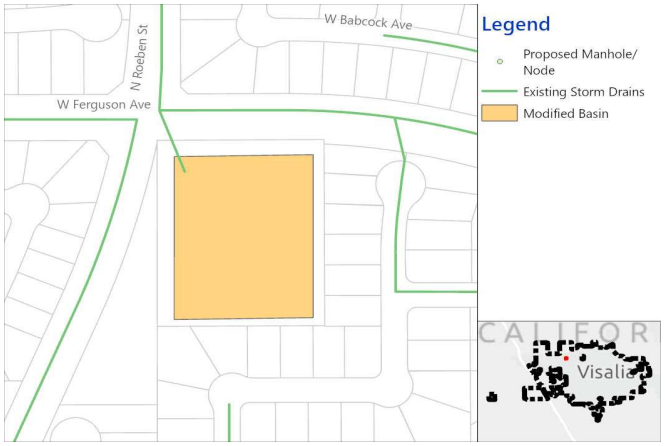
(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#3
Project Name: Foxwood Park Basin Storage Improvements
Project Description:

Future CIP #3 is a proposed storage basin improvement at Foxwood Park Basin. No storm drain pipe improvements are included with this project. The project includes 1 basin inlet/outlet structure, approximately 71,800 CY of storage basin excavation/regrading, basin site restoration, and basin access/miscellaneous appurtenances. The basin provides approximately 45 ac-ft of storage capacity. The proposed basin improvements increase available storage for runoff tributary to Foxwood Park Basin; however, the project footprint is constrained by the available basin area. Modeling results indicate that some flooding may remain under Future Conditions after the project is implemented. Because this project improves an existing basin in an Existing Conditions area, the project is subject to Existing Conditions criteria. Modeling results for the Existing Conditions design storm indicate that the applicable Existing Conditions criteria are met.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	250,400	250,400	75,100	325,500	89,500	415,000
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation / Regrading	71,800	CY	33	2,369,400	710,800	3,080,200	847,100	3,927,300
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Grand Total				$ 2,754,500	$ 826,300	$ 3,580,800	$ 984,800	$ 4,565,600

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

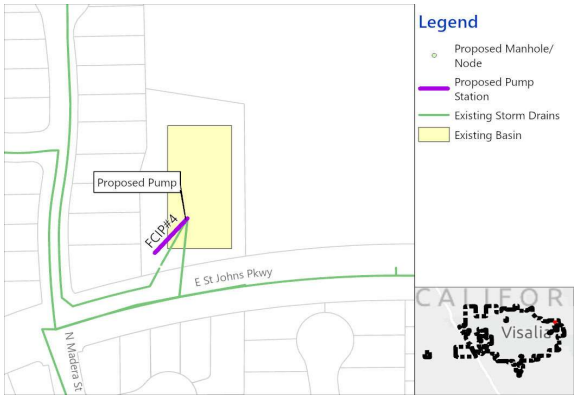
Tributary Area:

Project Number: FCIP#4
Project Name: River Run Ranch Basin West Pump Improvements

Project Description:

Future CIP #4 is a proposed pump improvement at the existing River Run Ranch Basin West wet well. The project includes installation of one 3.9 cfs stormwater pump and a tie-in to the existing force main that discharges to the St. Johns River. This improvement is intended to provide additional controlled drawdown capacity for River Run Ranch Basin West under future conditions while maintaining the existing basin and storm drain configuration. Minor residual flooding may remain in the upstream portion of the existing storm drain system because the downstream existing system remains a constraint; that existing-system limitation is not included in the FCIP#4 scope.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	31,200	31,200	9,400	40,600	11,200	51,800
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Tie-In to Existing Storm Drain / Existing Utility	1	EA	10,900	10,900	3,300	14,200	3,900	18,100
Small Stormwater Pump Installation Allowance	1	EA	272,300	272,300	81,700	354,000	97,400	451,400
Grand Total				$ 343,300	$ 103,000	$ 446,300	$ 122,900	$ 569,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

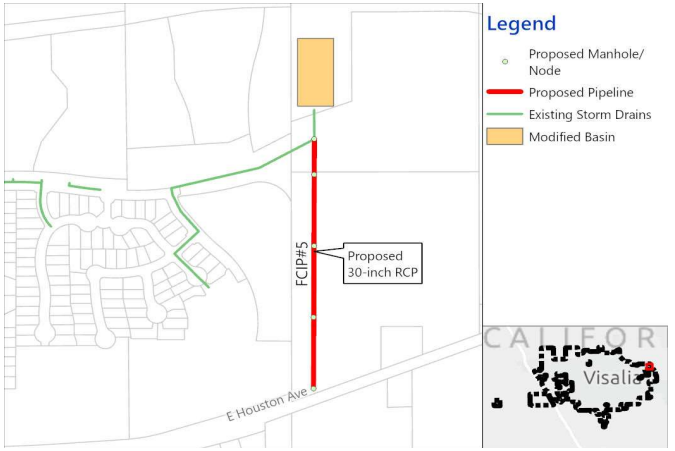
Tributary Area:

Project Number: FCIP#5
Project Name: River Run Ranch East Storm Drain and Basin Improvements

Project Description:

Future CIP #5 is a proposed storm drain conveyance and storage basin improvement serving the River Run Ranch East drainage area near Road 148 and Ivanhoe Drive. The project includes approximately 1,450 LF of new/proposed 30-inch RCP storm drain. The project also includes approximately 4 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard. The project also includes 1 basin inlet/outlet structure and approximately 40,100 CY of storage basin excavation/regrading for the existing River Run Ranch East Basin. The modeled basin provides approximately 25 ac-ft of modeled storage capacity. The proposed improvements provide new conveyance capacity to the existing basin and increase available basin storage for future runoff tributary to the River Run Ranch East drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	202,300	202,300	60,700	263,000	72,300	335,300
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 30-inch RCP Storm Drain	1,450	LF	340	493,000	147,900	640,900	176,200	817,100
Construct Storm Drain Manhole / Junction Structure	4	EA	16,000	64,000	19,200	83,200	22,900	106,100
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation / Regrading	40,100	CY	33	1,323,300	397,000	1,720,300	473,100	2,193,400
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Grand Total				$ 2,225,300	$ 667,600	$ 2,892,900	$ 795,600	$ 3,688,500

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

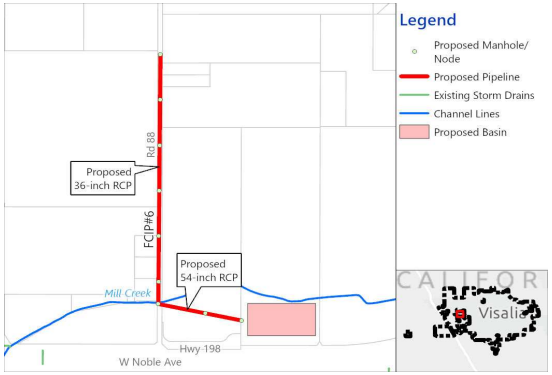
Project Number: FCIP#6

Project Name: Scenic Corridor Northwest Storm Drain and Basin Improvements

Project Description:

Future CIP #6 is a proposed storm drain conveyance and storage basin improvement serving the Scenic Corridor Northwest drainage area near Mill Creek and W Noble Avenue/Hwy 198. The project includes approximately 2,900 LF of new/proposed storm drain improvements, including approximately 2,200 LF of 36-inch RCP and 700 LF of 54-inch RCP. The project also includes approximately 8 storm drain manholes/junction structures based on the City-preferred 400 LF spacing standard, 1 basin inlet/outlet structure, and approximately 98,600 CY of storage basin excavation for the proposed storage basin. The modeled basin provides approximately 61 ac-ft of modeled storage capacity. The proposed improvements convey future runoff to the proposed storage basin and provide dedicated storage to reduce future-condition flooding in the tributary drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	607,300	607,300	182,200	789,500	217,100	1,006,600
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	2,200	LF	370	814,000	244,200	1,058,200	291,000	1,349,200
Construct 54-inch RCP Storm Drain	700	LF	670	469,000	140,700	609,700	167,700	777,400
Construct Storm Drain Manhole / Junction Structure	8	EA	16,000	128,000	38,400	166,400	45,800	212,200
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation / Regrading	98,600	CY	33	3,253,800	976,100	4,229,900	1,163,200	5,393,100
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	5	AC	150,000	742,700	222,800	965,500	265,500	1,231,000
Perimeter Fencing	1,822	LF	56	102,000	30,600	132,600	36,500	169,100
Perimeter Landscaping	28,230	SF	6	169,400	50,800	220,200	60,600	280,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	991	LF	232	229,900	69,000	298,900	82,200	381,100
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 6,679,800	$ 2,003,900	$ 8,683,700	$ 2,388,200	$ 11,071,900

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

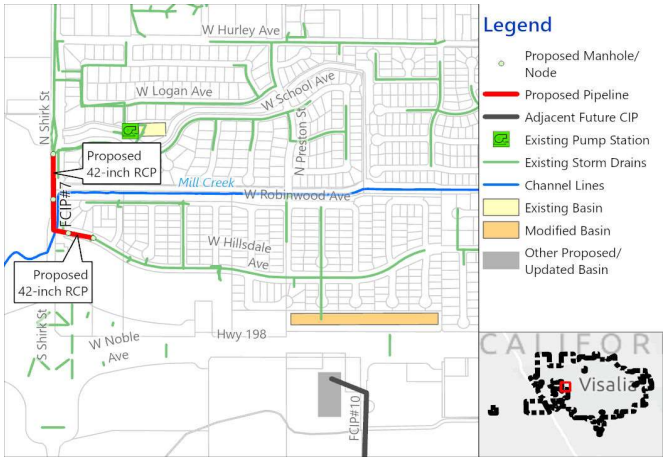
(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#7
Project Name: Hillsdale Basin and Shirk Road Storm Drain Improvements

Project Detail:



Project Description:

Future CIP #7 is a proposed storm drain conveyance and modified storage basin project serving the Hillsdale Avenue, Shirk Road, and Scenic Corridor Northeast area. The project excludes storm drain segments identified by the City as pre-existing or currently under construction. The remaining project scope includes approximately 1,000 LF of proposed 42-inch RCP storm drain improvements. The project also includes approximately 3 storm drain manholes/junction structures, 3 basin inlet/outlet structures, and approximately 52,200 CY of storage basin excavation/regrading for the Hillsdale Basin. The basin provides approximately 32 ac-ft of storage capacity. The proposed improvements provide conveyance and dedicated storage for future runoff while maintaining the planned Hillsdale Basin grading and access features.

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	238,700	238,700	71,600	310,300	85,300	395,600
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 42-inch RCP Storm Drain	1,000	LF	410	410,000	123,000	533,000	146,600	679,600
Construct Storm Drain Manhole / Junction Structure	3	EA	16,000	48,000	14,400	62,400	17,200	79,600
Construct Basin Inlet / Outlet Structure	3	EA	32,000	96,000	28,800	124,800	34,300	159,100
Storage Basin Excavation / Regrading	52,200	CY	33	1,722,600	516,800	2,239,400	615,800	2,855,200
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Grand Total				$ 2,626,000	$ 787,800	$ 3,413,800	$ 938,900	$ 4,352,700

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

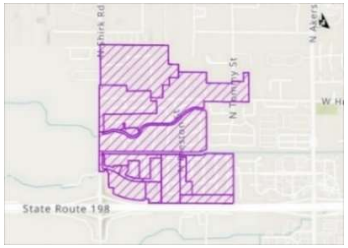
(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project a

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:



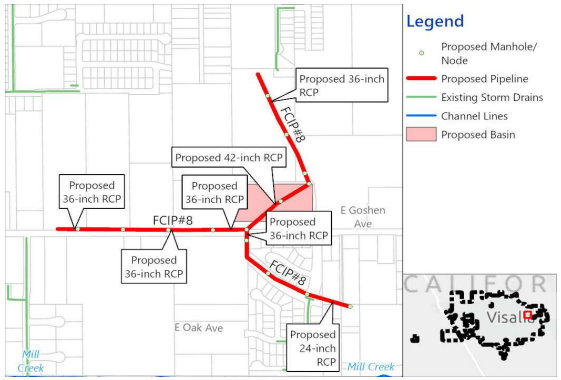
Project Number: FCIP#8

Project Name: Goshen Avenue and Goshen/Virmargo Basin Storm Drain Improvements

Project Description:

Future CIP #8 is a proposed storm drain conveyance and storage basin project near Goshen Avenue between Cain Street and Virmargo Street. The project includes approximately 4,300 LF of new/proposed storm drain improvements, including approximately 400 LF of 24-inch RCP, 3,800 LF of 36-inch RCP, and 100 LF of 42-inch RCP. The project also includes approximately 12 storm drain manholes/junction structures and 2 basin inlet/outlet structures. Additional improvements include approximately 145,300 CY of storage basin excavation for the Goshen/Virmargo storage basin. The basin provides approximately 90 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the basin and provide dedicated storage to reduce future-condition flooding along the Goshen Avenue drainage system.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	735,500	735,500	220,700	956,200	263,000	1,219,200
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	400	LF	300	120,000	36,000	156,000	42,900	198,900
Construct 36-inch RCP Storm Drain	3,800	LF	370	1,406,000	421,800	1,827,800	502,600	2,330,400
Construct 42-inch RCP Storm Drain	100	LF	410	41,000	12,300	53,300	14,700	68,000
Construct Storm Drain Manhole / Junction Structure	12	EA	16,000	192,000	57,600	249,600	68,600	318,200
Construct Basin Inlet / Outlet Structure	2	EA	32,000	64,000	19,200	83,200	22,900	106,100
Storage Basin Excavation	145,300	CY	33	4,794,900	1,438,500	6,233,400	1,714,200	7,947,600
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Perimeter Fencing	2,220	LF	56	124,300	37,300	161,600	44,400	206,000
Perimeter Landscaping	34,200	SF	6	205,200	61,600	266,800	73,400	340,200
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,190	LF	232	276,100	82,800	358,900	98,700	457,600
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 8,090,700	$ 2,427,300	$ 10,518,000	$2,892,600	$13,410,600

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

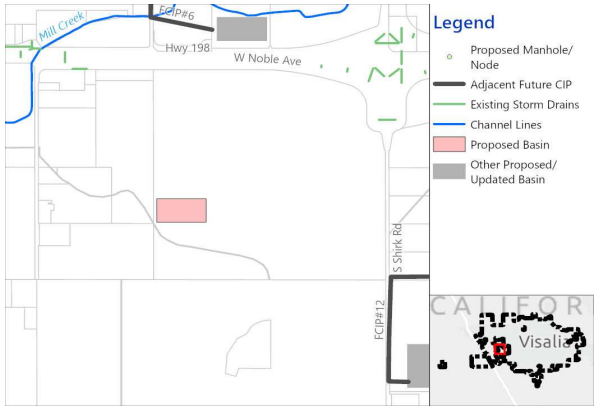
Project Number: FCIP#9

Project Name: Southwest SR-198/Shirk Road Drainage Area Storage Basin Improvements

Project Description:

Future CIP #9 is a proposed storage basin improvement serving the southwest SR-198/Shirk Road drainage area, generally bounded by SR-198 to the north, Shirk Road to the east, and Persian Ditch to the southwest. No storm drain pipe improvements are included with this project. The project includes 1 basin inlet/outlet structure and approximately 92,200 CY of storage basin excavation for the proposed storage basin serving this tributary area. The basin provides approximately 57 ac-ft of storage capacity. The proposed basin improvements provide dedicated storage for future runoff tributary to this drainage area and reduce future-condition flooding by increasing available storage within the basin system.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[(2)(3)] ($)	Contingency ($)	Estimated Construction Cost[(4)]($)	Soft Costs ($)	Capital Improvement Cost[(5)]($)
Mobilization (10%)	1	LS	442,300	442,300	132,700	575,000	158,100	733,100
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	92,200	CY	33	3,042,600	912,800	3,955,400	1,087,700	5,043,100
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	5	AC	150,000	722,600	216,800	939,400	258,300	1,197,700
Perimeter Fencing	1,796	LF	56	100,600	30,200	130,800	36,000	166,800
Perimeter Landscaping	27,840	SF	6	167,000	50,100	217,100	59,700	276,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	978	LF	232	226,900	68,100	295,000	81,100	376,100
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 4,865,700	$ 1,459,800	$ 6,325,500	$1,739,500	$8,065,000

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

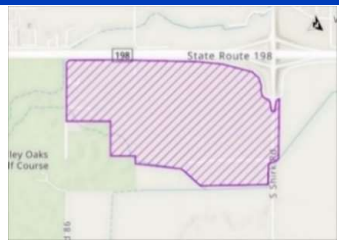
(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:



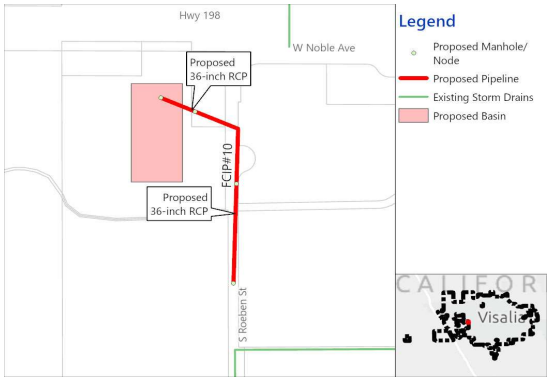
Project Number: FCIP#10

Project Name: Scenic Corridor Southeast Storm Drain and Basin Improvements

Project Description:

Future CIP #10 is a proposed storm drain conveyance and storage basin project serving the Scenic Corridor Southeast area. The project includes approximately 950 LF of new/proposed 36-inch RCP storm drain. The project also includes approximately 3 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 41,600 CY of storage basin excavation for the proposed Scenic Corridor Southeast storage basin. The basin provides approximately 26 ac-ft of storage capacity. The proposed improvements route future runoff from the tributary drainage area to the storage basin and provide dedicated storage to reduce future-condition flooding in the local drainage system.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	270,800	270,800	81,200	352,000	96,800	448,800
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	950	LF	370	351,500	105,500	457,000	125,700	582,700
Construct Storm Drain Manhole / Junction Structure	3	EA	16,000	48,000	14,400	62,400	17,200	79,600
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	41,600	CY	33	1,372,800	411,800	1,784,600	490,800	2,275,400
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	405,100	121,500	526,600	144,800	671,400
Perimeter Fencing	1,308	LF	56	73,200	22,000	95,200	26,200	121,400
Perimeter Landscaping	20,520	SF	6	123,100	36,900	160,000	44,000	204,000
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	734	LF	232	170,300	51,100	221,400	60,900	282,300
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 2,978,500	$ 893,500	$ 3,872,000	$1,065,000	$4,937,000

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

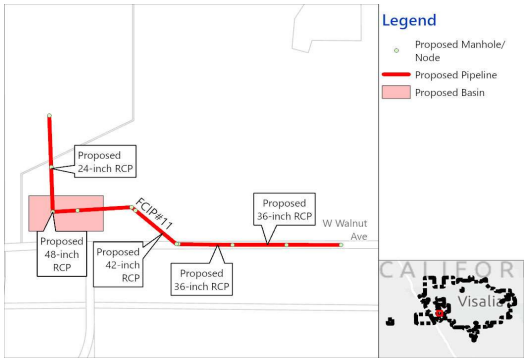
Project Number: FCIP#11

Project Name: Walnut Avenue and Road 86 Storm Drain and Basin Improvements

Project Description:

Future CIP #11 is a proposed storm drain conveyance and storage basin project near Walnut Avenue and Road 86. The project includes approximately 4,250 LF of new/proposed storm drain improvements, including approximately 750 LF of 24-inch RCP, 2,350 LF of 36-inch RCP, 650 LF of 42-inch RCP, and 500 LF of 48-inch RCP. The project also includes approximately 12 storm drain manholes/junction structures, 2 basin inlet/outlet structures, and approximately 87,800 CY of storage basin excavation for the proposed Walnut Avenue and Road 86 storage basin. The basin provides approximately 54 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the proposed storage basin and provide dedicated storage to reduce future-condition flooding within the Walnut Avenue and Road 86 drainage system.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	612,200	612,200	183,700	795,900	218,900	1,014,800
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	750	LF	300	225,000	67,500	292,500	80,400	372,900
Construct 36-inch RCP Storm Drain	2,350	LF	370	869,500	260,900	1,130,400	310,900	1,441,300
Construct 42-inch RCP Storm Drain	650	LF	410	266,500	80,000	346,500	95,300	441,800
Construct 48-inch RCP Storm Drain	500	LF	560	280,000	84,000	364,000	100,100	464,100
Construct Storm Drain Manhole / Junction Structure	12	EA	16,000	192,000	57,600	249,600	68,600	318,200
Construct Basin Inlet / Outlet Structure	2	EA	32,000	64,000	19,200	83,200	22,900	106,100
Storage Basin Excavation	87,800	CY	33	2,897,400	869,200	3,766,600	1,035,800	4,802,400
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	5	AC	150,000	706,900	212,100	919,000	252,700	1,171,700
Perimeter Fencing	1,774	LF	56	99,300	29,800	129,100	35,500	164,600
Perimeter Landscaping	27,510	SF	6	165,100	49,500	214,600	59,000	273,600
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	967	LF	232	224,300	67,300	291,600	80,200	371,800
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 6,733,900	$ 2,020,300	$ 8,754,200	$2,407,500	$11,161,700

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

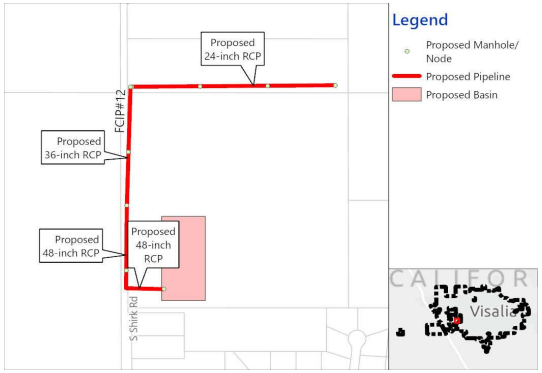
Project Number: FCIP#12

Project Name: Shirk Road and Tulare Avenue Storm Drain and Basin Improvements

Project Description:

Future CIP #12 is a proposed storm drain conveyance and storage basin project serving the drainage area generally bounded by Shirk Road, Roeben Street, Walnut Avenue, and Tulare Avenue. The project includes approximately 2,850 LF of new/proposed storm drain improvements, including approximately 1,200 LF of 24-inch RCP, 750 LF of 36-inch RCP, and 900 LF of 48-inch RCP. The project also includes approximately 8 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 81,900 CY of storage basin excavation for the proposed storage basin. The basin provides approximately 51 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the proposed storage basin and provide dedicated storage to reduce future-condition flooding within the Shirk Road, Roeben Street, Walnut Avenue, and Tulare Avenue drainage

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	522,800	522,800	156,800	679,600	186,900	866,500
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	1,200	LF	300	360,000	108,000	468,000	128,700	596,700
Construct 36-inch RCP Storm Drain	750	LF	370	277,500	83,300	360,800	99,200	460,000
Construct 48-inch RCP Storm Drain	900	LF	560	504,000	151,200	655,200	180,200	835,400
Construct Storm Drain Manhole / Junction Structure	8	EA	16,000	128,000	38,400	166,400	45,800	212,200
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	81,900	CY	33	2,702,700	810,800	3,513,500	966,200	4,479,700
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	4	AC	150,000	630,700	189,200	819,900	225,500	1,045,400
Perimeter Fencing	1,668	LF	56	93,400	28,000	121,400	33,400	154,800
Perimeter Landscaping	25,920	SF	6	155,500	46,700	202,200	55,600	257,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	914	LF	232	212,000	63,600	275,600	75,800	351,400
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 5,750,300	$ 1,725,100	$ 7,475,400	$2,055,900	$9,531,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

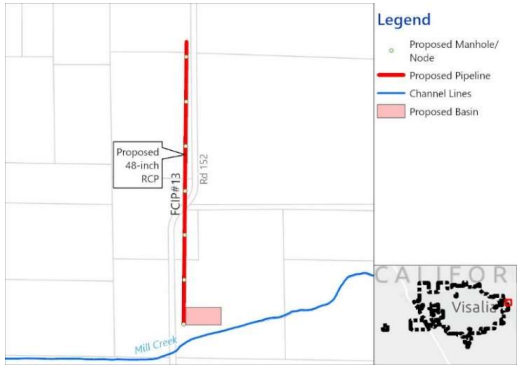
Project Number: FCIP#13

Project Name: Road 152 and Houston Avenue Storm Drain and Basin Improvements

Project Description:

Future CIP #13 is a proposed storm drain and storage basin project serving future development near Road 152 and East Houston Avenue. The project includes approximately 2,500 LF of 48-inch RCP storm drain, 7 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 22,900 CY of excavation for a new storage basin with approximately 14 ac-ft of storage capacity. The improvements provide dedicated stormwater conveyance and storage to accommodate future runoff within the Road 152 drainage area and reduce the potential for stormwater ponding as the area develops. The tributary area for this CIP contains concentrated areas of higher-density planned land use within a broader lower-density area. As such, each land use was evaluated separately rather than creating an area-weighted Curve Number as was done for the other FCIP tributary areas.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	301,600	301,600	90,500	392,100	107,800	499,900
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 48-inch RCP Storm Drain	2,500	LF	560	1,400,000	420,000	1,820,000	500,500	2,320,500
Construct Storm Drain Manhole / Junction Structure	7	EA	16,000	112,000	33,600	145,600	40,000	185,600
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	22,900	CY	33	755,700	226,700	982,400	270,200	1,252,600
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	2	AC	150,000	281,500	84,500	366,000	100,700	466,700
Perimeter Fencing	1,066	LF	56	59,700	17,900	77,600	21,300	98,900
Perimeter Landscaping	16,890	SF	6	101,300	30,400	131,700	36,200	167,900
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	613	LF	232	142,200	42,700	184,900	50,800	235,700
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 3,317,700	$ 995,400	$ 4,313,100	$1,186,100	$5,499,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

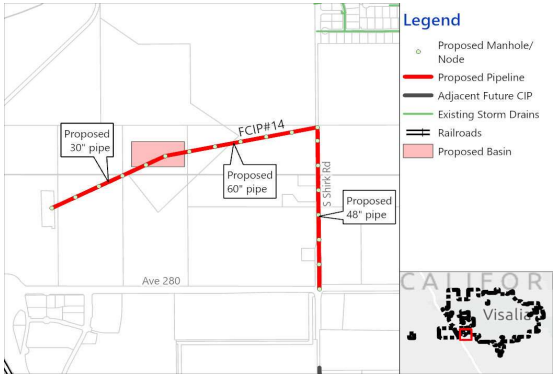
Project Number: FCIP#14

Project Name: Caldwell Avenue and Shirk Street Storm Drain and Basin Improvements

Project Description:

Future CIP #14 is a proposed storm drain conveyance and storage basin project serving the future growth area north of Caldwell Avenue in the Urban Reserve Area. The project includes approximately 5,650 LF of new/proposed storm drain improvements, including approximately 1,800 LF of 30-inch RCP, 1,250 LF of 48-inch RCP, and 2,600 LF of 60-inch RCP. The project also includes approximately 16 storm drain manholes/junction structures, 2 basin inlet/outlet structures, and approximately 195,700 CY of storage basin excavation for the proposed storage basin. The basin provides approximately 121 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the proposed storage basin and provide dedicated storage to reduce future-condition flooding in the Urban Reserve Area north of Caldwell Avenue.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	1,109,900	1,109,900	333,000	1,442,900	396,800	1,839,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 30-inch RCP Storm Drain	1,800	LF	340	612,000	183,600	795,600	218,800	1,014,400
Construct 48-inch RCP Storm Drain	1,250	LF	560	700,000	210,000	910,000	250,300	1,160,300
Construct 60-inch RCP Storm Drain	2,600	LF	840	2,184,000	655,200	2,839,200	780,800	3,620,000
Construct Storm Drain Manhole / Junction Structure	16	EA	16,000	256,000	76,800	332,800	91,500	424,300
Construct Basin Inlet / Outlet Structure	2	EA	32,000	64,000	19,200	83,200	22,900	106,100
Storage Basin Excavation	195,700	CY	33	6,458,100	1,937,400	8,395,500	2,308,800	10,704,300
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Perimeter Fencing	2,556	LF	56	143,100	42,900	186,000	51,200	237,200
Perimeter Landscaping	39,240	SF	6	235,400	70,600	306,000	84,200	390,200
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,358	LF	232	315,100	94,500	409,600	112,600	522,200
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 12,209,300	$ 3,662,700	$ 15,872,000	$4,365,100	$20,237,100

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

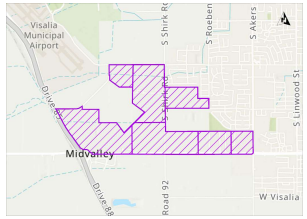
(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:



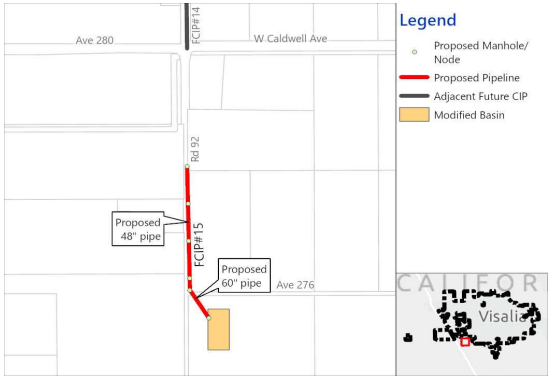
Project Number: FCIP#15

Project Name: South Shirk Road and Avenue 276 Storm Drain and Basin Improvements

Project Description:

Future CIP #15 is a proposed storm drain conveyance and storage basin project serving the South Shirk Road and Avenue 276 drainage area. The project includes approximately 1,750 LF of new/proposed storm drain improvements, including approximately 1,350 LF of 48-inch RCP and 400 LF of 60-inch RCP. The project also includes approximately 5 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 52,100 CY of storage basin excavation for the proposed storage basin. The basin provides approximately 32 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the proposed storage basin and provide dedicated storage to reduce future-condition flooding within the South Shirk Road and Avenue 276 drainage system.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	393,800	393,800	118,100	511,900	140,800	652,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 48-inch RCP Storm Drain	1,350	LF	560	756,000	226,800	982,800	270,300	1,253,100
Construct 60-inch RCP Storm Drain	400	LF	840	336,000	100,800	436,800	120,100	556,900
Construct Storm Drain Manhole / Junction Structure	5	EA	16,000	80,000	24,000	104,000	28,600	132,600
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	52,100	CY	33	1,719,300	515,800	2,235,100	614,700	2,849,800
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	482,100	144,600	626,700	172,300	799,000
Perimeter Fencing	1,440	LF	56	80,600	24,200	104,800	28,800	133,600
Perimeter Landscaping	22,500	SF	6	135,000	40,500	175,500	48,300	223,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	800	LF	232	185,600	55,700	241,300	66,400	307,700
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 4,332,100	$ 1,299,600	$ 5,631,700	$ 1,548,900	$ 7,180,600

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

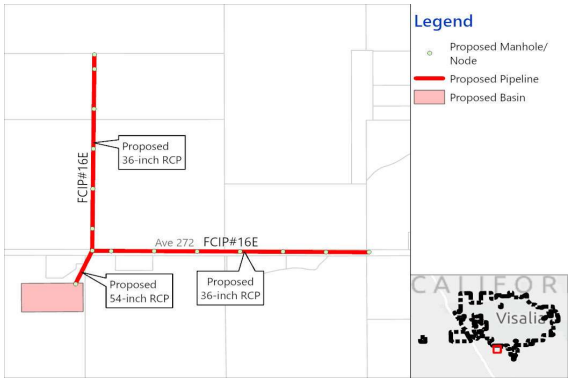
(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#16E
Project Name: Avenue 272 East Storm Drain Improvements
Project Description:

Future CIP #16E is a proposed storm drain conveyance and standalone storage basin project serving the future growth area east of the Tagus Basin drainage area. The project includes approximately 4,350 LF of new/proposed storm drain improvements, including approximately 3,000 LF of 36-inch RCP and 1,350 LF of 54-inch RCP. The project also includes approximately 12 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 111,700 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 69 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding without relying on storage or conveyance at Tagus Basin.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	732,100	732,100	219,600	951,700	261,700	1,213,400
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	3,000	LF	370	1,110,000	333,000	1,443,000	396,800	1,839,800
Construct 54-inch RCP Storm Drain	1,350	LF	670	904,500	271,400	1,175,900	323,400	1,499,300
Construct Storm Drain Manhole / Junction Structure	12	EA	16,000	192,000	57,600	249,600	68,600	318,200
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	111,700	CY	33	3,686,100	1,105,800	4,791,900	1,317,800	6,109,700
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	5	AC	150,000	757,600	227,300	984,900	270,800	1,255,700
Perimeter Fencing	1,842	LF	56	103,200	31,000	134,200	36,900	171,100
Perimeter Landscaping	28,530	SF	6	171,200	51,400	222,600	61,200	283,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,001	LF	232	232,200	69,700	301,900	83,000	384,900
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 8,052,600	$ 2,415,900	$ 10,468,500	$ 2,878,800	$ 13,347,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

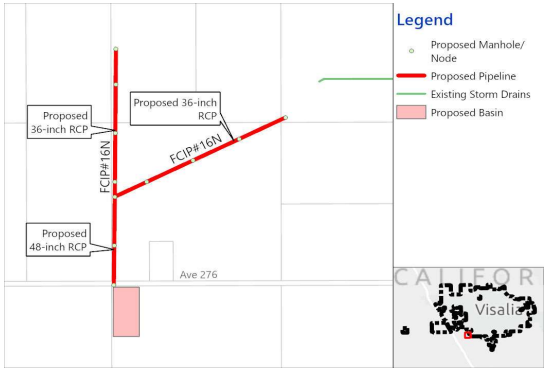
Project Number: FCIP#16N

Project Name: Southeast Caldwell/Shirk Tributary Storm Drain and Basin Improvements

Project Description:

Future CIP #16N is a proposed storm drain conveyance and standalone storage basin project serving the Southeast Caldwell/Shirk tributary area. The project includes approximately 3,300 LF of new/proposed storm drain improvements, including approximately 2,600 LF of 36-inch RCP and 700 LF of 48-inch RCP. The project also includes approximately 9 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 43,200 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 27 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding without relying on storage or conveyance at Tagus Basin.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	388,400	388,400	116,500	504,900	138,800	643,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	2,600	LF	370	962,000	288,600	1,250,600	343,900	1,594,500
Construct 48-inch RCP Storm Drain	700	LF	560	392,000	117,600	509,600	140,100	649,700
Construct Storm Drain Manhole / Junction Structure	9	EA	16,000	144,000	43,200	187,200	51,500	238,700
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	43,200	CY	33	1,425,600	427,700	1,853,300	509,700	2,363,000
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	422,000	126,600	548,600	150,900	699,500
Perimeter Fencing	1,338	LF	56	74,900	22,500	97,400	26,800	124,200
Perimeter Landscaping	20,970	SF	6	125,800	37,700	163,500	45,000	208,500
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	749	LF	232	173,800	52,100	225,900	62,100	288,000
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 4,272,200	$ 1,281,600	$ 5,553,800	$ 1,527,400	$ 7,081,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

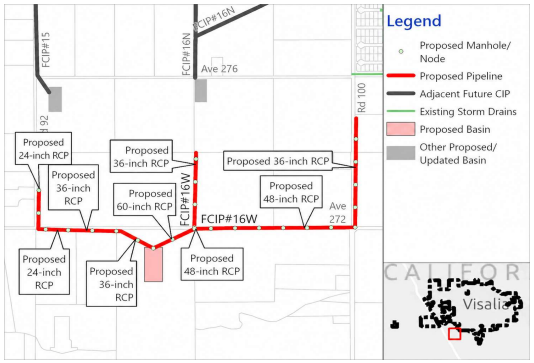
Project Number: FCIP#16W

Project Name: Avenue 272 West Storm Drain and Tagus Basin Improvements

Project Description:

Future CIP #16W is a proposed storm drain conveyance and storage basin project serving the Tagus Basin drainage area. The project includes approximately 8,250 LF of new/proposed storm drain improvements, including approximately 1,050 LF of 24-inch RCP, 4,300 LF of 36-inch RCP, 2,500 LF of 48-inch RCP, and 400 LF of 60-inch RCP. The project also includes approximately 22 storm drain manholes/junction structures, 2 basin inlet/outlet structures, and approximately 123,400 CY of storage basin excavation for the proposed Tagus Basin. The basin provides approximately 76 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the proposed Tagus Basin and provide dedicated storage to reduce future-condition flooding. FCIP #16W represents the Tagus Basin project; the separate FCIP #16E and FCIP #16N standalone basins are not included in this scope.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	879,200	879,200	263,800	1,143,000	314,300	1,457,300
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	1,050	LF	300	315,000	94,500	409,500	112,600	522,100
Construct 36-inch RCP Storm Drain	4,300	LF	370	1,591,000	477,300	2,068,300	568,800	2,637,100
Construct 48-inch RCP Storm Drain	2,500	LF	560	1,400,000	420,000	1,820,000	500,500	2,320,500
Construct 60-inch RCP Storm Drain	400	LF	840	336,000	100,800	436,800	120,100	556,900
Construct Storm Drain Manhole / Junction Structure	22	EA	16,000	352,000	105,600	457,600	125,800	583,400
Construct Basin Inlet / Outlet Structure	2	EA	32,000	64,000	19,200	83,200	22,900	106,100
Storage Basin Excavation	123,400	CY	33	4,072,200	1,221,700	5,293,900	1,455,800	6,749,700
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Perimeter Fencing	1,930	LF	56	108,100	32,400	140,500	38,600	179,100
Perimeter Landscaping	29,850	SF	6	179,100	53,700	232,800	64,000	296,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,045	LF	232	242,400	72,700	315,100	86,700	401,800
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$9,670,700	$2,901,200	$12,571,900	$3,457,300	$16,029,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

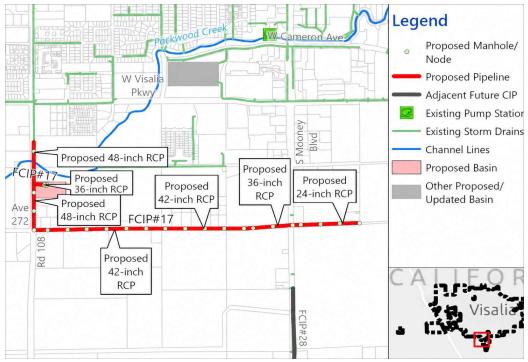
Project Number: FCIP#17

Project Name: Demaree Road and Avenue 272 Storm Drain and Basin Improvements

Project Description:

Future CIP #17 is a proposed storm drain conveyance and standalone storage basin project serving the Demaree Road, Avenue 272, Visalia Parkway, and County Center Drive drainage area. The project includes approximately 8,800 LF of new/proposed storm drain improvements, including approximately 1,350 LF of 24-inch RCP, 1,900 LF of 36-inch RCP, 4,300 LF of 42-inch RCP, and 1,250 LF of 48-inch RCP. The project also includes approximately 24 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 122,400 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 76 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the Demaree Road and Avenue 272 drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4] ($)	Soft Costs ($)	Capital Improvement Cost[5] ($)
Mobilization (10%)	1	LS	958,500	958,500	287,600	1,246,100	342,700	1,588,800
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	1,350	LF	300	405,000	121,500	526,500	144,800	671,300
Construct 36-inch RCP Storm Drain	1,900	LF	370	703,000	210,900	913,900	251,300	1,165,200
Construct 42-inch RCP Storm Drain	4,300	LF	410	1,763,000	528,900	2,291,900	630,300	2,922,200
Construct 48-inch RCP Storm Drain	1,250	LF	560	700,000	210,000	910,000	250,300	1,160,300
Construct Storm Drain Manhole / Junction Structure	24	EA	16,000	384,000	115,200	499,200	137,300	636,500
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	122,400	CY	33	4,039,200	1,211,800	5,251,000	1,444,000	6,695,000
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	6	AC	150,000	879,800	263,900	1,143,700	314,500	1,458,200
Perimeter Fencing	1,996	LF	56	111,800	33,500	145,300	40,000	185,300
Perimeter Landscaping	30,840	SF	6	185,000	55,500	240,500	66,100	306,600
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,078	LF	232	250,100	75,000	325,100	89,400	414,500
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 10,543,100	$ 3,162,900	$ 13,706,000	$ 3,769,300	$ 17,475,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

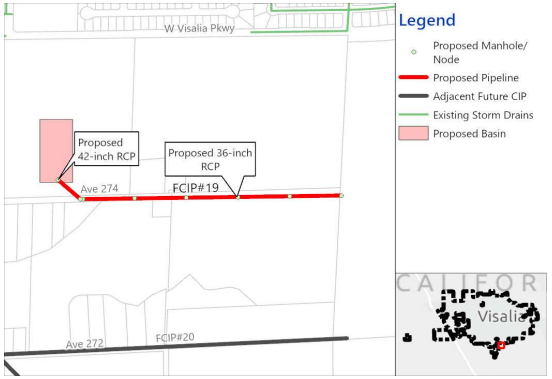
Project Number: FCIP#19

Project Name: Avenue 274 and Stonebrook Area Storm Drain and Basin Improvements

Project Description:

Future CIP #19 is a proposed storm drain conveyance and standalone storage basin project serving the Avenue 274 and Stonebrook drainage area, near Avenue 274 west of South Court Street and east of South Stonebrook Street. The project includes approximately 2,250 LF of new/proposed storm drain improvements, including approximately 2,000 LF of 36-inch RCP and 250 LF of 42-inch RCP. The project also includes approximately 6 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 72,900 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 45 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the Avenue 274 and Stonebrook drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	457,100	457,100	137,100	594,200	163,400	757,600
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	2,000	LF	370	740,000	222,000	962,000	264,600	1,226,600
Construct 42-inch RCP Storm Drain	250	LF	410	102,500	30,800	133,300	36,700	170,000
Construct Storm Drain Manhole / Junction Structure	6	EA	16,000	96,000	28,800	124,800	34,300	159,100
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	72,900	CY	33	2,405,700	721,700	3,127,400	860,000	3,987,400
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	4	AC	150,000	610,000	183,000	793,000	218,100	1,011,100
Perimeter Fencing	1,638	LF	56	91,700	27,500	119,200	32,800	152,000
Perimeter Landscaping	25,470	SF	6	152,800	45,800	198,600	54,600	253,200
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	899	LF	232	208,600	62,600	271,200	74,600	345,800
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 5,028,100	$ 1,508,400	$ 6,536,500	$ 1,797,700	$ 8,334,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

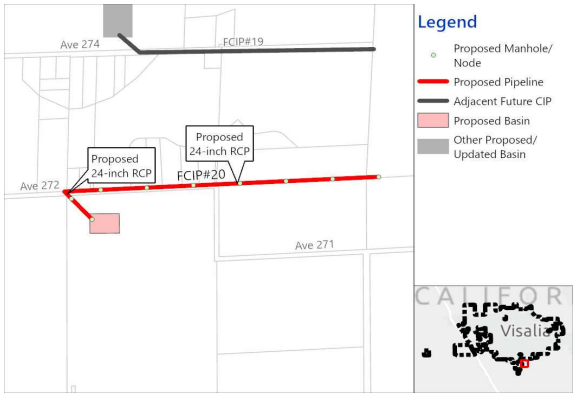
Project Number: FCIP#20

Project Name: Avenue 272 and Stonebrook Area Storm Drain and Basin Improvements

Project Description:

Future CIP #20 is a proposed storm drain conveyance and standalone storage basin project serving the Avenue 272 and Stonebrook drainage area. The project includes approximately 3,050 LF of new/proposed 24-inch RCP storm drain. The project also includes approximately 8 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 9,600 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 6 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the Avenue 272 drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	187,700	187,700	56,300	244,000	67,100	311,100
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	3,050	LF	300	915,000	274,500	1,189,500	327,100	1,516,600
Construct Storm Drain Manhole / Junction Structure	8	EA	16,000	128,000	38,400	166,400	45,800	212,200
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	9,600	CY	33	316,800	95,000	411,800	113,200	525,000
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	1	AC	150,000	141,800	42,500	184,300	50,700	235,000
Perimeter Fencing	716	LF	56	40,100	12,000	52,100	14,300	66,400
Perimeter Landscaping	11,640	SF	6	69,800	20,900	90,700	24,900	115,600
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	438	LF	232	101,600	30,500	132,100	36,300	168,400
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 2,064,500	$ 619,200	$ 2,683,700	$ 738,000	$ 3,421,700

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

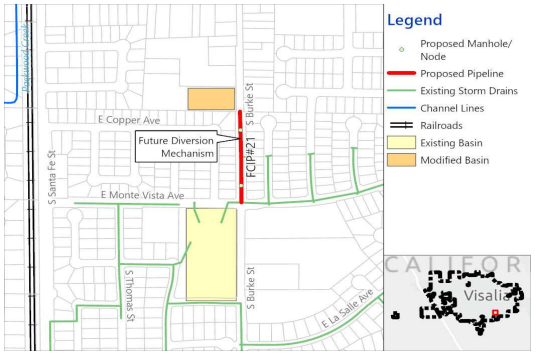
Tributary Area:

Project Number: FCIP#21
Project Name: Burke Street North Basin Partial Expansion Improvements

Project Description:

Future CIP #21 is a proposed Burke Street North basin partial expansion project serving the Burke Street North drainage area near Burke Park Pond. The north basin is subject to Existing Conditions criteria and is sized using the Existing Conditions design storm with an allowable basin depth of approximately 25.2 feet. The project includes approximately 32,100 CY of storage basin excavation and 1 basin inlet/outlet structure for the proposed north basin. The proposed north basin provides approximately 19.9 ac-ft of total modeled storage capacity at the 25.2-foot allowable depth. Burke Park Pond is retained as an existing connected storage feature and is not modified as part of this project. The project also includes a conceptual diversion allowance requested by Public Works to allow flows to be routed from Burke Park Pond to the north basin when needed for maintenance. This allowance is represented as approximately 600 LF of 24-inch RCP, approximately 2 storm drain manholes/junction structures, and 1 tie-in to the existing storm drain/storage system. Because the modeled project includes north basin expansion, the cost estimate includes land acquisition and frontage-related improvements for the northern basin area. Modeling results for the Existing Conditions design storm indicate that the applicable Existing Conditions criteria are met.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	201,900	201,900	60,600	262,500	72,200	334,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	600	LF	300	180,000	54,000	234,000	64,400	298,400
Construct Storm Drain Manhole / Junction Structure	2	EA	16,000	32,000	9,600	41,600	11,400	53,000
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Tie-In to Existing Storm Drain / Existing Utility	1	EA	10,900	10,900	3,300	14,200	3,900	18,100
Storage Basin Excavation	32,100	CY	33	1,059,300	317,800	1,377,100	378,700	1,755,800
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	2	AC	150,000	273,900	82,200	356,100	97,900	454,000
Perimeter Fencing	1,050	LF	56	58,800	17,600	76,400	21,000	97,400
Perimeter Landscaping	16,650	SF	6	99,900	30,000	129,900	35,700	165,600
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	605	LF	232	140,400	42,100	182,500	50,200	232,700
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 2,220,800	$ 666,300	$ 2,887,100	$ 794,000	$ 3,681,100

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#22NE

Project Name: Cameron Creek Northeast Storm Drain and Retention Basin Improvements

Project Description:

Future CIP #22NE is a proposed standalone storm drain conveyance and storage basin project serving the northeast portion of the Cameron Creek drainage area. The project is intended to provide localized conveyance and storage for the isolated tributary area and is not intended to connect to a larger downstream storm drain system. The project includes approximately 1,050 LF of new/proposed 42-inch RCP storm drain conveying runoff directly to the proposed standalone storage basin. The project also includes approximately 3 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 43,500 CY of storage basin excavation for the proposed northeast Cameron Creek storage basin. The basin provides approximately 27 ac-ft of storage capacity. The proposed improvements provide dedicated storage for the tributary area and reduce future-condition flooding without relying on downstream Cameron Creek system conveyance.

Project Detail:

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	279,000	279,000	83,700	362,700	99,700	462,400
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 42-inch RCP Storm Drain	1,050	LF	410	430,500	129,200	559,700	153,900	713,600
Construct Storm Drain Manhole / Junction Structure	3	EA	16,000	48,000	14,400	62,400	17,200	79,600
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	43,500	CY	33	1,435,500	430,700	1,866,200	513,200	2,379,400
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	2	AC	150,000	365,100	109,500	474,600	130,500	605,100
Perimeter Fencing	1,234	LF	56	69,100	20,700	89,800	24,700	114,500
Perimeter Landscaping	19,410	SF	6	116,500	35,000	151,500	41,700	193,200
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	697	LF	232	161,700	48,500	210,200	57,800	268,000
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 3,069,100	$ 920,800	$ 3,989,900	$ 1,097,300	$ 5,087,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

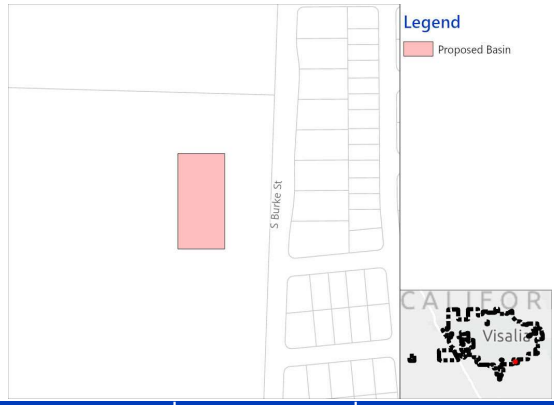
(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#22NW
Project Name: Cameron Creek Northwest Retention Basin Improvements

Project Detail:



Project Description:

Future CIP #22NW is a proposed standalone storage basin project serving the northwest portion of the Cameron Creek drainage area. The project is intended to provide localized storage for the isolated tributary area and is not intended to connect to a larger downstream storm drain system. No storm drain pipe improvements are included with this project. The project includes 1 basin inlet/outlet structure and approximately 28,700 CY of storage basin excavation for the proposed northwest Cameron Creek storage basin. The basin provides approximately 18 ac-ft of storage capacity. The proposed improvements provide dedicated storage for the tributary area and reduce future-condition flooding without relying on downstream Cameron Creek system conveyance.

Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	166,500	166,500	50,000	216,500	59,500	276,000
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	28,700	CY	33	947,100	284,100	1,231,200	338,600	1,569,800
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	2	AC	150,000	262,300	78,700	341,000	93,800	434,800
Perimeter Fencing	1,024	LF	56	57,300	17,200	74,500	20,500	95,000
Perimeter Landscaping	16,260	SF	6	97,600	29,300	126,900	34,900	161,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	592	LF	232	137,300	41,200	178,500	49,100	227,600
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 1,831,800	$ 549,600	$ 2,381,400	$ 655,000	$ 3,036,400

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

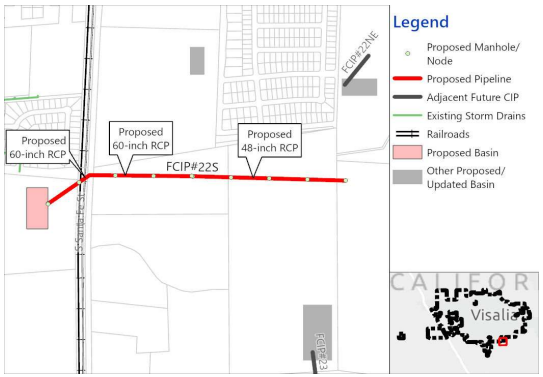
Project Number: FCIP#22S

Project Name: Cameron Creek South Storm Drain and Storage Basin Improvements

Project Description:

Future CIP #22S is a proposed standalone storm drain conveyance and storage basin project serving the southern portion of the Cameron Creek drainage area. The project is intended to serve the isolated southern tributary area and route runoff to a dedicated standalone storage basin. The project includes approximately 3,200 LF of new/proposed storm drain improvements, including approximately 1,600 LF of 48-inch RCP and 1,600 LF of 60-inch RCP conveying runoff to the proposed southern Cameron Creek storage basin. The project also includes approximately 8 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 62,800 CY of storage basin excavation for the proposed basin. The basin provides approximately 40 ac-ft of storage capacity. The proposed improvements provide dedicated conveyance and storage for the southern tributary area and reduce future-condition flooding without relying on downstream Cameron Creek system conveyance.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[(2)(3)] ($)	Contingency ($)	Estimated Construction Cost[(4)]($)	Soft Costs ($)	Capital Improvement Cost[(5)]($)
Mobilization (10%)	1	LS	550,300	550,300	165,100	715,400	196,700	912,100
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 48-inch RCP Storm Drain	1,600	LF	560	896,000	268,800	1,164,800	320,300	1,485,100
Construct 60-inch RCP Storm Drain	1,600	LF	840	1,344,000	403,200	1,747,200	480,500	2,227,700
Construct Storm Drain Manhole / Junction Structure	8	EA	16,000	128,000	38,400	166,400	45,800	212,200
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	62,800	CY	33	2,072,400	621,700	2,694,100	740,900	3,435,000
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	493,100	147,900	641,000	176,300	817,300
Perimeter Fencing	1,458	LF	56	81,600	24,500	106,100	29,200	135,300
Perimeter Landscaping	22,770	SF	6	136,600	41,000	177,600	48,800	226,400
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	809	LF	232	187,700	56,300	244,000	67,100	311,100
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 6,053,400	$ 1,816,000	$ 7,869,400	$ 2,164,200	$ 10,033,600

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

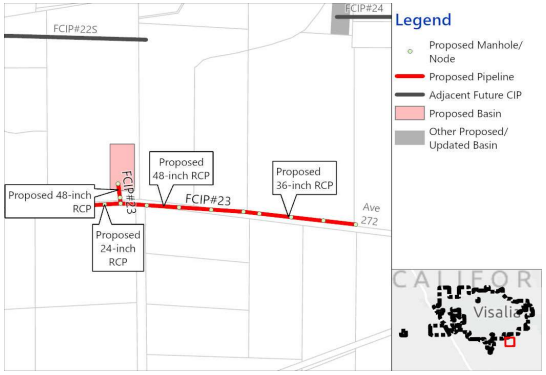
Project Number: FCIP#23

Project Name: Pinkham Street and Avenue 272 Storm Drain and Basin Improvements

Project Description:

Future CIP #23 is a proposed storm drain conveyance and standalone storage basin project serving the future drainage area near Pinkham Street and Avenue 272. The project includes approximately 4,550 LF of new/proposed storm drain improvements, including approximately 1,300 LF of 24-inch RCP, 1,400 LF of 36-inch RCP, and 1,850 LF of 48-inch RCP. The project also includes approximately 13 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 108,800 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 67 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the Pinkham Street and Avenue 272 drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[(2)(3)] ($)	Contingency ($)	Estimated Construction Cost[(4)]($)	Soft Costs ($)	Capital Improvement Cost[(5)]($)
Mobilization (10%)	1	LS	726,200	726,200	217,900	944,100	259,600	1,203,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	1,300	LF	300	390,000	117,000	507,000	139,400	646,400
Construct 36-inch RCP Storm Drain	1,400	LF	370	518,000	155,400	673,400	185,200	858,600
Construct 48-inch RCP Storm Drain	1,850	LF	560	1,036,000	310,800	1,346,800	370,400	1,717,200
Construct Storm Drain Manhole / Junction Structure	13	EA	16,000	208,000	62,400	270,400	74,400	344,800
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	108,800	CY	33	3,590,400	1,077,100	4,667,500	1,283,600	5,951,100
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	6	AC	150,000	826,500	248,000	1,074,500	295,500	1,370,000
Perimeter Fencing	1,930	LF	56	108,100	32,400	140,500	38,600	179,100
Perimeter Landscaping	29,850	SF	6	179,100	53,700	232,800	64,000	296,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,045	LF	232	242,400	72,700	315,100	86,700	401,800
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 7,988,400	$ 2,396,500	$ 10,384,900	$ 2,856,000	$ 13,240,900

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

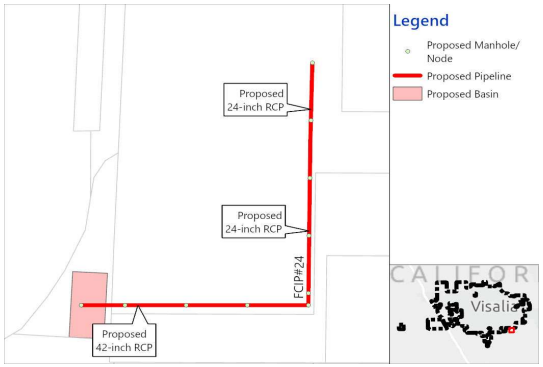
Tributary Area:

Project Number: FCIP#24
Project Name: Cameron Creek North/Future Southeast Growth Area Storm Drain and Basin Improvements

Project Description:

Future CIP #24 is a proposed storm drain conveyance and standalone storage basin project serving the Cameron Creek / future southeast growth area. The project is intended to route tributary flows to a dedicated storage basin and is not intended to connect to a larger downstream storm drain system. The project includes approximately 3,200 LF of new/proposed storm drain improvements, including approximately 1,700 LF of 24-inch RCP and 1,500 LF of 42-inch RCP. The project also includes approximately 9 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 57,200 CY of storage basin excavation for the proposed storage basin. The basin provides approximately 35 ac-ft of storage capacity. The proposed improvements provide dedicated conveyance and storage for the tributary area and reduce future-condition flooding without relying on downstream Cameron Creek system conveyance.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[(2)(3)] ($)	Contingency ($)	Estimated Construction Cost[(4)]($)	Soft Costs ($)	Capital Improvement Cost[(5)]($)
Mobilization (10%)	1	LS	424,400	424,400	127,300	551,700	151,700	703,400
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 24-inch RCP Storm Drain	1,700	LF	300	510,000	153,000	663,000	182,300	845,300
Construct 42-inch RCP Storm Drain	1,500	LF	410	615,000	184,500	799,500	219,900	1,019,400
Construct Storm Drain Manhole / Junction Structure	9	EA	16,000	144,000	43,200	187,200	51,500	238,700
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	57,200	CY	33	1,887,600	566,300	2,453,900	674,800	3,128,700
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	510,700	153,200	663,900	182,600	846,500
Perimeter Fencing	1,486	LF	56	83,200	25,000	108,200	29,800	138,000
Perimeter Landscaping	23,190	SF	6	139,100	41,700	180,800	49,700	230,500
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	823	LF	232	190,900	57,300	248,200	68,300	316,500
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 4,668,600	$ 1,400,600	$ 6,069,200	$ 1,669,200	$ 7,738,400

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

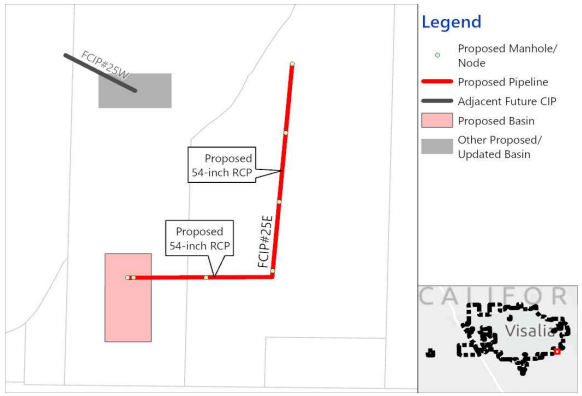
Project Number: FCIP#25E

Project Name: Cameron Creek South East Storm Drain and Basin Improvements

Project Description:

Future CIP #25E is a proposed storm drain conveyance and standalone storage basin project serving the eastern portion of the future southeast growth area tributary to the Cameron Creek drainage system. The project includes approximately 2,000 LF of new/proposed 54-inch RCP storm drain conveying runoff to the proposed standalone storage basin. The project also includes approximately 5 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 80,100 CY of storage basin excavation for the proposed basin. The basin provides approximately 50 ac-ft of storage capacity. The proposed improvements provide dedicated conveyance and storage for the tributary area and reduce future-condition flooding.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	530,200	530,200	159,100	689,300	189,600	878,900
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 54-inch RCP Storm Drain	2,000	LF	670	1,340,000	402,000	1,742,000	479,100	2,221,100
Construct Storm Drain Manhole / Junction Structure	5	EA	16,000	80,000	24,000	104,000	28,600	132,600
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	80,100	CY	33	2,643,300	793,000	3,436,300	945,000	4,381,300
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	4	AC	150,000	618,300	185,500	803,800	221,000	1,024,800
Perimeter Fencing	1,650	LF	56	92,400	27,700	120,100	33,000	153,100
Perimeter Landscaping	25,650	SF	6	153,900	46,200	200,100	55,000	255,100
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	905	LF	232	210,000	63,000	273,000	75,100	348,100
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 5,831,800	$ 1,749,600	$ 7,581,400	$ 2,085,000	$ 9,666,400

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

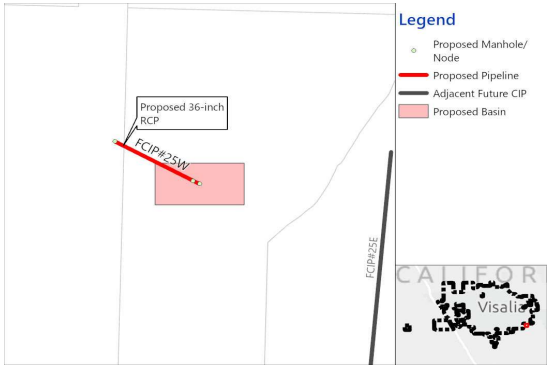
(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

Project Number: FCIP#25W
Project Name: Cameron Creek Southwest Storage Basin Improvements
Project Description:

Future CIP #25W is a proposed storm drain conveyance and standalone storage basin project serving the western portion of the future southeast growth area. The project is intended to provide localized conveyance and storage for the isolated tributary area and is not intended to connect to a larger downstream storm drain system. The project includes approximately 1,250 LF of new/proposed 36-inch RCP storm drain conveying runoff to the proposed standalone storage basin. The project also includes approximately 4 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 50,000 CY of storage basin excavation for the proposed basin. The basin provides approximately 31 ac-ft of storage capacity. The proposed improvements provide dedicated conveyance and storage for the tributary area and reduce future-condition flooding without relying on downstream system conveyance.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	312,800	312,800	93,800	406,600	111,800	518,400
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	1,250	LF	370	462,500	138,800	601,300	165,400	766,700
Construct Storm Drain Manhole / Junction Structure	4	EA	16,000	64,000	19,200	83,200	22,900	106,100
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	50,000	CY	33	1,650,000	495,000	2,145,000	589,900	2,734,900
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	416,100	124,800	540,900	148,700	689,600
Perimeter Fencing	1,328	LF	56	74,400	22,300	96,700	26,600	123,300
Perimeter Landscaping	20,820	SF	6	124,900	37,500	162,400	44,700	207,100
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	744	LF	232	172,600	51,800	224,400	61,700	286,100
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 3,441,000	$ 1,032,300	$ 4,473,300	$ 1,230,300	$ 5,703,600

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

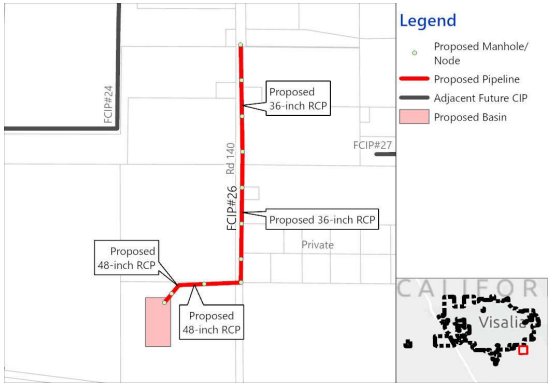
Project Number: FCIP#26

Project Name: Lovers Lane South of Avenue 280 Storm Drain and Basin Improvements

Project Description:

Future CIP #26 is a proposed storm drain conveyance and standalone storage basin project serving the future drainage area south of Avenue 280 near Lovers Lane. The project includes approximately 3,600 LF of new/proposed storm drain improvements, including approximately 2,650 LF of 36-inch RCP and 950 LF of 48-inch RCP. The project also includes approximately 10 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 89,600 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 56 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the Lovers Lane and Avenue 280 drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4]($)	Soft Costs ($)	Capital Improvement Cost[5]($)
Mobilization (10%)	1	LS	597,700	597,700	179,300	777,000	213,700	990,700
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	2,650	LF	370	980,500	294,200	1,274,700	350,500	1,625,200
Construct 48-inch RCP Storm Drain	950	LF	560	532,000	159,600	691,600	190,200	881,800
Construct Storm Drain Manhole / Junction Structure	10	EA	16,000	160,000	48,000	208,000	57,200	265,200
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	89,600	CY	33	2,956,800	887,000	3,843,800	1,057,000	4,900,800
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	5	AC	150,000	698,100	209,400	907,500	249,600	1,157,100
Perimeter Fencing	1,762	LF	56	98,700	29,600	128,300	35,300	163,600
Perimeter Landscaping	27,330	SF	6	164,000	49,200	213,200	58,600	271,800
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	961	LF	232	223,000	66,900	289,900	79,700	369,600
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 6,574,500	$ 1,972,300	$ 8,546,800	$ 2,350,400	$ 10,897,200

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

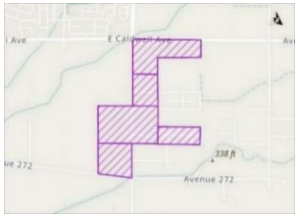
(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:



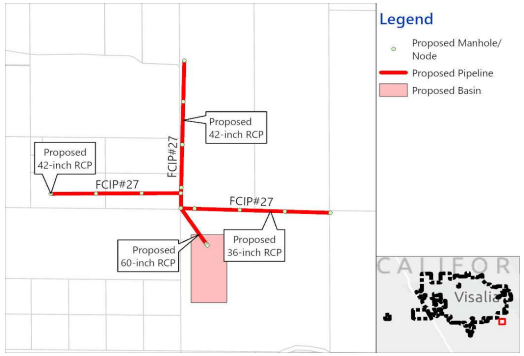
Project Number: FCIP#27

Project Name: McAuliff Street and Visalia Parkway Storm Drain and Basin Improvements

Project Description:

Future CIP #27 is a proposed storm drain conveyance and standalone storage basin project serving the future drainage area near McAuliff Street and Visalia Parkway. The project includes approximately 4,400 LF of new/proposed storm drain improvements, including approximately 1,300 LF of 36-inch RCP, 2,550 LF of 42-inch RCP, 150 LF of 54-inch RCP, and 400 LF of 60-inch RCP. The project also includes approximately 13 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 126,800 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 79 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the McAuliff Street and Visalia Parkway drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4] ($)	Soft Costs ($)	Capital Improvement Cost[5] ($)
Mobilization (10%)	1	LS	796,700	796,700	239,000	1,035,700	284,800	1,320,500
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	1,300	LF	370	481,000	144,300	625,300	172,000	797,300
Construct 42-inch RCP Storm Drain	2,550	LF	410	1,045,500	313,700	1,359,200	373,800	1,733,000
Construct 54-inch RCP Storm Drain	150	LF	670	100,500	30,200	130,700	35,900	166,600
Construct 60-inch RCP Storm Drain	400	LF	840	336,000	100,800	436,800	120,100	556,900
Construct Storm Drain Manhole / Junction Structure	13	EA	16,000	208,000	62,400	270,400	74,400	344,800
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	126,800	CY	33	4,184,400	1,255,300	5,439,700	1,495,900	6,935,600
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	6	AC	150,000	896,000	268,800	1,164,800	320,300	1,485,100
Perimeter Fencing	2,016	LF	56	112,900	33,900	146,800	40,400	187,200
Perimeter Landscaping	31,140	SF	6	186,800	56,000	242,800	66,800	309,600
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	1,088	LF	232	252,400	75,700	328,100	90,200	418,300
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 8,763,900	$ 2,629,200	$ 11,393,100	$ 3,133,200	$ 14,526,300

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area:

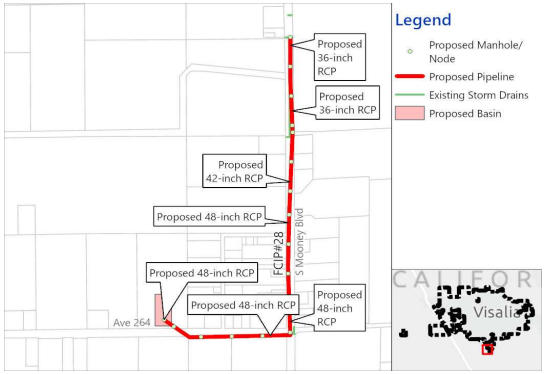
Project Number: FCIP#28

Project Name: South Mooney Boulevard and Avenue 264 Storm Drain and Basin Improvements

Project Description:

Future CIP #28 is a proposed storm drain conveyance and standalone storage basin project serving the future drainage area near Visalia Parkway and the southeast growth area. The project includes approximately 5,750 LF of new/proposed storm drain improvements, including approximately 1,300 LF of 36-inch RCP, 1,100 LF of 42-inch RCP, and 3,350 LF of 48-inch RCP. The project also includes approximately 16 storm drain manholes/junction structures, 1 basin inlet/outlet structure, and approximately 55,300 CY of storage basin excavation for the proposed standalone storage basin. The basin provides approximately 34 ac-ft of storage capacity. The proposed improvements convey future runoff from the tributary drainage area to the standalone storage basin and provide dedicated storage to reduce future-condition flooding in the tributary drainage area.

Project Detail:



Project Details:

Project Element	Quantity	Unit	Unit Cost ($)	Baseline Construction Cost[2][3] ($)	Contingency ($)	Estimated Construction Cost[4] ($)	Soft Costs ($)	Capital Improvement Cost[5] ($)
Mobilization (10%)	1	LS	591,200	591,200	177,400	768,600	211,400	980,000
Construction Baseline Schedule and Updates	1	LS	1,100	1,100	300	1,400	400	1,800
Temporary Erosion Control / SWPPP	1	LS	2,800	2,800	800	3,600	1,000	4,600
Pothole Utilities	1	LS	5,000	5,000	1,500	6,500	1,800	8,300
Construction Survey	1	LS	12,000	12,000	3,600	15,600	4,300	19,900
Traffic Control	1	LS	8,000	8,000	2,400	10,400	2,900	13,300
Construct 36-inch RCP Storm Drain	1,300	LF	370	481,000	144,300	625,300	172,000	797,300
Construct 42-inch RCP Storm Drain	1,100	LF	410	451,000	135,300	586,300	161,200	747,500
Construct 48-inch RCP Storm Drain	3,350	LF	560	1,876,000	562,800	2,438,800	670,700	3,109,500
Construct Storm Drain Manhole / Junction Structure	16	EA	16,000	256,000	76,800	332,800	91,500	424,300
Construct Basin Inlet / Outlet Structure	1	EA	32,000	32,000	9,600	41,600	11,400	53,000
Storage Basin Excavation	55,300	CY	33	1,824,900	547,500	2,372,400	652,400	3,024,800
Basin Site Restoration / Irrigation Repair Allowance	1	LS	54,500	54,500	16,400	70,900	19,500	90,400
Basin Access / Miscellaneous Appurtenances	1	LS	27,300	27,300	8,200	35,500	9,800	45,300
Land Acquisition	3	AC	150,000	465,000	139,500	604,500	166,200	770,700
Perimeter Fencing	1,412	LF	56	79,100	23,700	102,800	28,300	131,100
Perimeter Landscaping	22,080	SF	6	132,500	39,800	172,300	47,400	219,700
ROW/Frontage (Parkway, sidewalk, curb/gutter, pavement frontage)	786	LF	232	182,400	54,700	237,100	65,200	302,300
ROW/Frontage (Drive Approach)	1	EA	7,000	7,000	2,100	9,100	2,500	11,600
ROW/Frontage (Corner Improvements)	1	EA	14,000	14,000	4,200	18,200	5,000	23,200
Grand Total				$ 6,502,800	$ 1,950,900	$ 8,453,700	$ 2,324,900	$ 10,778,600

Notes:

(1) Costs based on project size

(2) Engineering News-Record (ENR) 20 City Average Cost Index for August 2026 is 14,350

(3) Baseline Construction Cost is based on multiplying the unit cost by dimension/quantity for each Project Element.

(4) Estimated Construction Cost includes a 30% contingency of the Baseline Construction Cost.

(5) Capital Improvement Cost includes 10% markup for engineering, 10% markup for construction management, and 7.5% markup for project administration.

(6) Cost of permits, if required, have not been included in construction estimate

Tributary Area: