

# CHAPTER 1. INTRODUCTION

The City of Manteca (City), Figure 1-1, contracted with West Yost & Associates (WYA) to prepare a Storm Drain Master Plan (Master Plan) update. This report presents the methodology and the analysis conducted, results of the analysis and recommended improvements to the City's storm drain system. Project cost information is included for use in the Public Facilities Implementation Plan and the proposed Capital Improvement Plan (CIP).

Manteca has maintained and expanded its storm drain system to improve drainage for its present citizens and to construct the necessary facilities to meet the needs of those moving into new growth areas. This update identifies the drainage facilities needed to meet the needs of the 2003 General Plan.

The backbone of the City's storm drains is a long standing relationship with the South San Joaquin Irrigation District (SSJID) and use of the District's drains and laterals. The master plan was prepared in consultation with SSJID and respects their needs and wishes. The plan is also dependent on continued use of SSJID facilities.

## **Planning Approach and Design Criteria**

The master plan update builds on the several previous master planning efforts and updates. This document is a compilation from all previous plans as appropriate. The overall objective is to provide storm drainage facilities to protect from a 10-year rainfall runoff. All facilities are to meet criteria and standards of the City and SSJID.

This Master Plan includes drainage facilities from the detention basins downstream to the terminus of SSJID facilities. Storm drains upstream of detention basins will continue to be constructed in accordance with City design standards.

## **Data Collection**

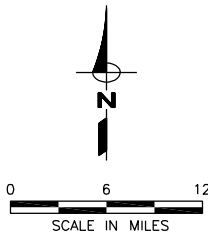
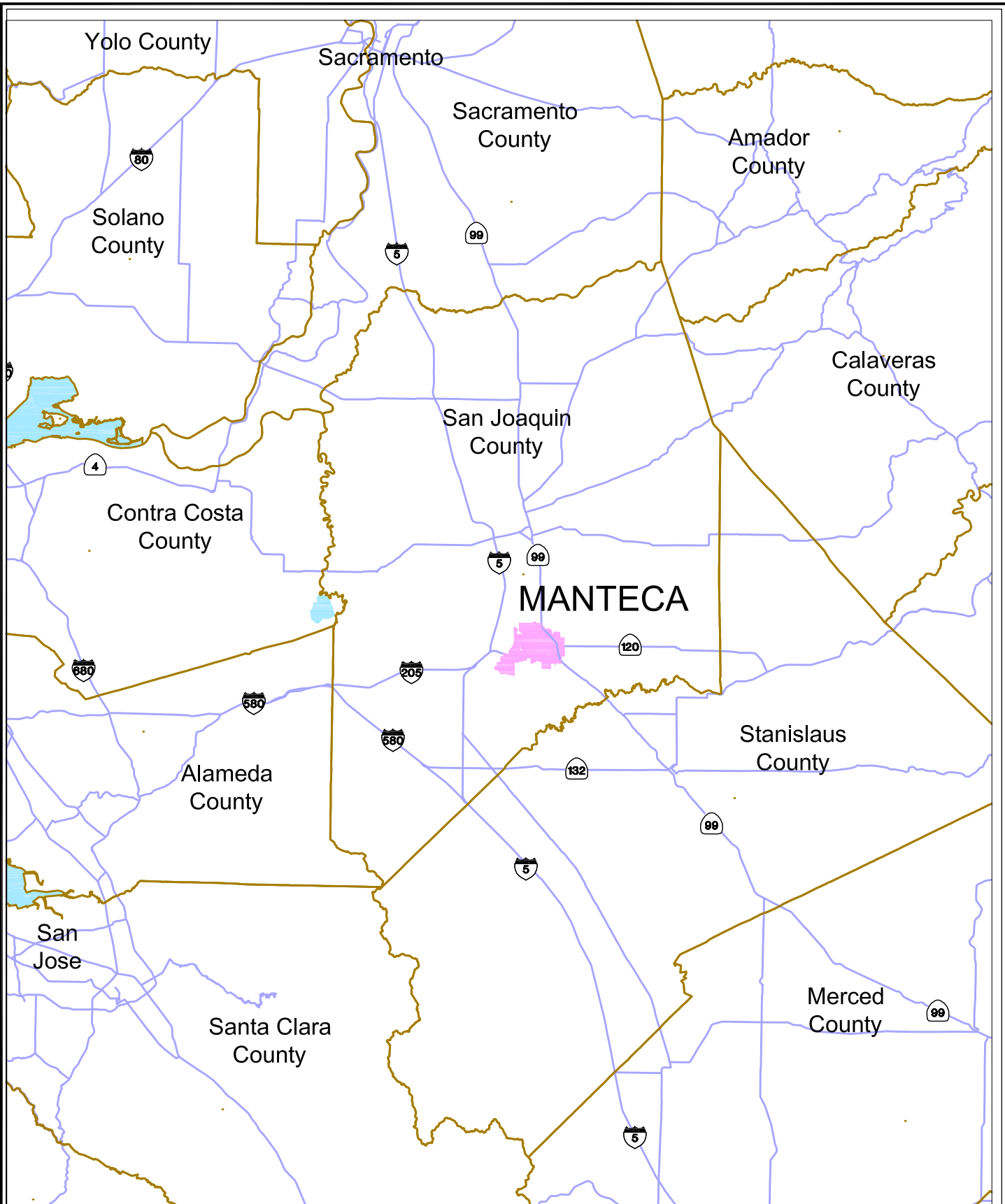
The City is undertaking studies and analyses leading to an update of the Master Plan. This section summarizes the data and information sources to be used in formulating the master plan. The base mapping to be used in developing and presenting the master plan is also discussed.

### Data and Information Sources

Data and information sources used in formulating the 2003 master plan update include:

- Previous master plans
- City of Manteca files
- City of Manteca staff interviews
- South San Joaquin Irrigation District
- San Joaquin County
- French Camp Outlet Canal Studies
- Natural Resources Conservation Service
- Survey/Topographic Data

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**Figure 1-1**  
**City of Manteca**  
**Storm Drain Master Plan**  
**VICINITY MAP**



### Previous Master Plans

The 2004 Master Plan Update is building upon previous master planning efforts in 1967, 1974, 1986, 1991, 1999, and 2002. Each of these plans and plan updates includes valuable analyses and provides recommendations to the City to improve storm drainage and to better plan for future needs. The unpublished 2002 plan will be an important part of the present update. The 1993 Public Facilities Implementation Plan reports are also an important resource. Documents to be included in review of data and information sources include:

- Storm Drainage Master Plan. June 1990
- Public Facilities Implementation Plan, City of Manteca, Nolte and Associates, December 1993
- Storm Drainage Master Plan for City of Manteca, Public Facilities Implementation Plan, Nolte and Associates, December 1993
- Storm Drainage Master Plan, Draft, November 2002

### City of Manteca Files

The City files were the primary source of data, especially the elevation, pipe, channel and pump data needed for the dynamic modeling. Along with the file data, key staff such as Don Milam and Joe Hulsey were a valuable resource. Especially important were improvement plans and as built drawings of completed drainage facilities. The City also furnished aerial mapping of the City that was used throughout the master planning tasks.

The City made its GIS mapping available and it was used to propose work maps and was the starting point for preparation of base maps.

### City of Manteca Staff

Important resources were conversations and interviews with City staff. City maintenance personnel provided information on experiences during storms, where flooding occurred and procedures that have proven inadequate.

### South San Joaquin Irrigation District

The irrigation district owns the drains and laterals that are the backbone of the City's storm drain system. A working relationship was maintained with SSJID staff especially Sam Bologna, Engineering Department Supervisor, who provided important assistance. The master plan must meet SSJID requirements for limiting stormwater inflows to drains and laterals. It also must maintain the integrity of SSJID facilities including more stringent National Pollutant Discharge Elimination System (NPDES) water quality restrictions.

### San Joaquin County

The County was an important resource throughout the master planning process. The County is working with the City on implementation of the City's NPDES permit. The County Hydrology Manual is a supporting document particularly with reference to precipitation and unit hydrograph derivation for the City's hydrology methodology. Other supporting data including soils

information was obtained from the County and aerial mapping provided by the County was used in the planning work.

### French Camp Outlet Canal Studies

Information developed as part of the joint studies of the French Camp Outlet Canal (FCOC) as reported in *South San Joaquin Irrigation District, French Camp Outlet Canal, Hydraulic Capacity Evaluation, July 2002* was used in the master plan.

In depth analyses were undertaken by SSJID and CH2M Hill using the MIKE11 computer program from the Danish Hydraulics Institute (DHI), that defined improvements needed in the FCOC and, in particular, reconstruction of road crossings. The channel cross-section information and recommended improvements were used in the XP-SWMM model.

### Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) soils maps for San Joaquin County were used to identify hydrologic soil graphs in the modeling effort.

### Survey/Topographic Data

A series of survey reports were made available by the City. These reports provided field survey information on SSJID drains that gave cross-section data and elevation data. The City also provided additional topographic mapping for use in the study.

### Master Plan Mapping

Master Plan base maps were prepared using the AutoCAD files provided by the City and removing layers to result in a series of maps that best present the needed data.

## **Methodology**

Manteca has consistently updated its storm drainage with applied standards and criteria, updated master plans and responses to recognized problems. Methodology for the 2004 Master Plan update begins with the foundation laid down by previous work, plans, decisions and capital investments. The present planning effort recognizes the complexity of the storm drain system that has grown over the years with 38 pumping plants and detention basins with many more in the entitlement process. The backbone of the update is the preparation of a dynamic computer model of the system. The model was formulated as an XP-SWMM model, a model originally developed by the Environmental Protection Agency (EPA). The present version was advanced by XP Software, Inc. A dynamic model allows analysis over time and provides the opportunity to maximize the efficiency of detention basin and pump operation along with monitoring and control of downstream water levels to minimize flooding problems with minimal new constructed facilities.

The model identified the location and scope of flooding problems and was the primary tool, supplemented by physical data and personal observations, for identifying and setting priorities of recommended improvements. Stakeholder meetings provided opportunities to review the plan with knowledgeable staff and engineers and landowners active in the community.

## **Organization of Master Plan Report**

Chapter 2 reviews the existing drainage system in Manteca. Figure 2-1 shows the major drainage sheds referred to throughout the Master Plan.

Chapter 3 presents a summary of policies and design criteria. These criteria will guide development of drainage systems throughout the City.

The formulation of the XP-SWMM dynamic model is discussed in Chapter 4. This discussion is focused on modeling the existing system and then expanding the model to include projected land use changes and lands planned for new growth. The Master Plan model also includes the proposed Master Plan drainage projects.

Chapter 5 deals with using the Master Plan model to analyze and evaluate drainage problems and solutions to problems. The dynamic model allows study of basin and pump operation to minimize drainage problems without major project construction.

Chapter 6 discusses stormwater quality and facilities and/or activities are integrated into the collection, storage and conveyance of stormwater runoff to minimize stormwater pollutants.

Chapter 7 presents the proposed Master Plan improvements needed so that Manteca may provide a reasonable level of service to all of its residents.

Chapter 8 is the prioritized Capital Improvement Program that provides a guide for the implementation of the recommended improvements. The cost data and capital improvement data will be used in the preparation of an updated Public Facilities Implementation Plan.