

## **1.0 INTRODUCTION**

### **1.1 Context for Stormwater Master Plan**

El Paso is situated in the Chihuahuan Desert in western Texas. The rainfall averages 8 inches annually, and residents enjoy more than 300 sunny days in a typical year. The community is also subject to occasional hard rains during the summer monsoon season.

Beginning on July 31, 2006 and continuing through early August, a series of torrential rains hit the El Paso area causing flooding in many areas of town. This series of rains is referred to as Storm 2006. El Paso County received a federal disaster declaration, Federal Emergency Management Agency (FEMA)-1658-DR, on August 15, 2006 in which FEMA approved approximately \$6.6 million in public assistance funds to help in the repair and rebuilding of infrastructure that was damaged or destroyed during the flooding. The City estimates that the total damage to public and private property totaled more than \$250 million.

Storm 2006 was a significant event in the life of the El Paso community. While the event itself and the associated impacts were significant in their own right, the storm and ensuing analyses demonstrated a broader risk to the community: many areas not impacted by Storm 2006 localized heavy rains are equally at risk for future damage. Further, flood risk may be felt—in fact has been felt historically—by lesser storm events.

The system that conveys stormwater in El Paso is a highly variable mix of structures built to very different standards. Rain events of varying intensity and duration have significantly different impacts within the City. Many in the El Paso community recognized that the City is ready for a more standardized approach to flood and drainage issues including a more protective system of infrastructure and regulation related to drainage standards.

The response to Storm 2006 was in several parts:

- Emergency response and repairs;
- Initial evaluations of damage and causes;
- Collection of additional data to support the early evaluations;
- Major repairs initiated by the city to address more obvious and critical issues;
- Adoption of new drainage design standards in the Drainage Design Manual (DDM) for the development of property; and
- The creation of a new stormwater utility with more adequate funding to manage and maintain the City's storm drainage system.

There was also a recognition by many involved with the Storm 2006 response that additional data and analysis as well as a longer-term plan of action were required for the City to have the means to address its complex drainage issues in a reasoned and cost-effective manner. This overall need was recognized as part of the process of creating the new stormwater utility.

In July of 2007, the City of El Paso passed an ordinance creating El Paso Water Utilities (EPWU) under the management of the Public Service Board (PSB). The goals of the new utility are to plan, design, construct, operate, maintain, and finance a stormwater system that adequately provides for public safety, protection of property, water quality, multi-use opportunities, and aesthetics. The City recognized that a comprehensive stormwater program is critical to providing flood control and protecting the safety of the public.

## **1.2 Stormwater Master Plan Overview**

A Stormwater Master Plan (SMP) was proposed to evaluate the existing stormwater drainage system, identify problem areas, and develop a logical approach to upgrade of the City's stormwater system. More specifically, the SMP was developed to:

- Estimate the stormwater runoff quantities;
- Evaluate major features of the existing stormwater drainage system;
- Identify components of the existing stormwater drainage system that are undersized;
- Identify areas of potential sediment and debris flow;
- Identify risks associated with the existing dams;
- Recommend major stormwater drainage system improvements; and
- Develop a general prioritization of recommended improvements for use in developing a Capital Improvement Program (CIP) based on the available funding from the stormwater fee.

Developing such a plan is a major effort. El Paso encompasses over 250 square miles, not including upper drainage areas. The major drainage infrastructure consists of:

- 16 stormwater pump stations;
- 38 dams;
- 270 detention/retention ponds;
- 103 miles of open channels;
- 48 miles of agricultural drains;
- More than 500 miles of storm drain conduits; and
- Approximately 4,100 storm drain inlets.

Due to the magnitude and complexity of the existing system, this SMP focuses on the primary drainage features. Minor underground storm drain systems were not included in the detailed analysis.

### **1.3 Technical Standards and Assumptions Impacting the Plan**

One associated issue that has been raised in conjunction with the discussion of stormwater protection in El Paso relates to the standards used for evaluating flood risk, regulation, and appropriate infrastructure improvements. Implicit in the analyses and recommendations of the SMP are standards commonly used in the Southwest for evaluating risk and appropriate levels of protection within drainage systems. One such factor is the design storm, which is the 100-year storm according to the DDM, and typically the standard design storm used by similar size cities throughout the Southwest (e.g., Albuquerque, Denver, Las Vegas, and Tucson). While some observers have interpreted this as a once in a lifetime event—and therefore an excessively conservative standard for evaluations and the basis of structural improvements—it is far from either. Rather, the 100-year storm is a statistical description of the probability of the event occurring based on historical rainfall measurements. The 100-year storm has a 1 percent (%) chance of occurring in any given year. Since this is a statistical probability, there is a slight chance that the 100-year storm could occur in adjacent years or even more than once in a single year.

The use of 100-year design storm is standard in flood evaluations and flood protection. It is the standard used by flood insurance providers, funding entities and regulators in making many determinations. The community is well served by including the use of this standard in their planning and regulations. To not reflect this standard could be costly to the community on many levels.

The intent of this document is not to address stormwater improvements for areas that are currently undeveloped. Guidance for new development can be found in the City of El Paso DDM. Generally, the standards and criteria found in the manual are minimum standards designed to prevent new development from negatively impacting the flood risk of other property owners. The intent of these standards is to prevent a worsening of flood risk (occurrence and severity) in areas developed after their adoption. This is the approach used in both the Northeast Master Plan (Kimley-Horn and Associates Inc. [KHA], 2005) and Westside Land Study (Parkhill, Smith, & Cooper, Inc. [PSC] & Moreno Cardenas Inc. [MCi], 2005) sponsored by the PSB.

### **1.4 Community Collaboration**

It should be acknowledged that several regional entities other than the PSB have a significant direct or indirect role in the management of stormwater in the El Paso Region, and these entities provided significant input during the development of the SMP. These entities include the City of El Paso and the El Paso County Water Control and Improvement District (EPCWID) (Number [No.] 1 or the Irrigation District).

The City of El Paso supervised many of the background studies that form the technical basis for the SMP, to include a broad series of studies (described in Section 2.0) following the 2006 flood; and a broad series of preliminary designs performed to address problems identified during this event. City of El Paso provided access to this information and through attendance in working meetings provided insights into specific project conditions and City needs.

The EPCWID No. 1 owns, maintains, and operates the agricultural feeder canals and drains in the valley adjacent to the Rio Grande, in particular the Montoya Drain and several drains (Mesa, Middle, Playa, Franklin) in the Mission Valley watershed. In a series of meetings, District staff provided input as to issues associated with control of City stormwater during the 2006 floods; provided access to standard design practice within the valley (via the District design manual); and provided input as to specific areas with known flood capacity inadequacy.

The community as a whole has a significant interest in stormwater related issues. These broader interests were reflected by the SMP Community Advisory Committee (CAC) which also provided significant input into the process.

The SMP CAC is a 30+ member committee of citizens that represent numerous local civic and business organizations. This committee met with EPWU and the project team nine times throughout the preparation of the SMP to provide input to the master planning process and the selection of projects for the Stormwater CIP. Their input was extremely useful in placing the SMP in the proper local context, providing very helpful insights into both technical evaluations and the communication of that information, and otherwise giving useful feedback on issues of community interest.