

# 1. INTRODUCTION

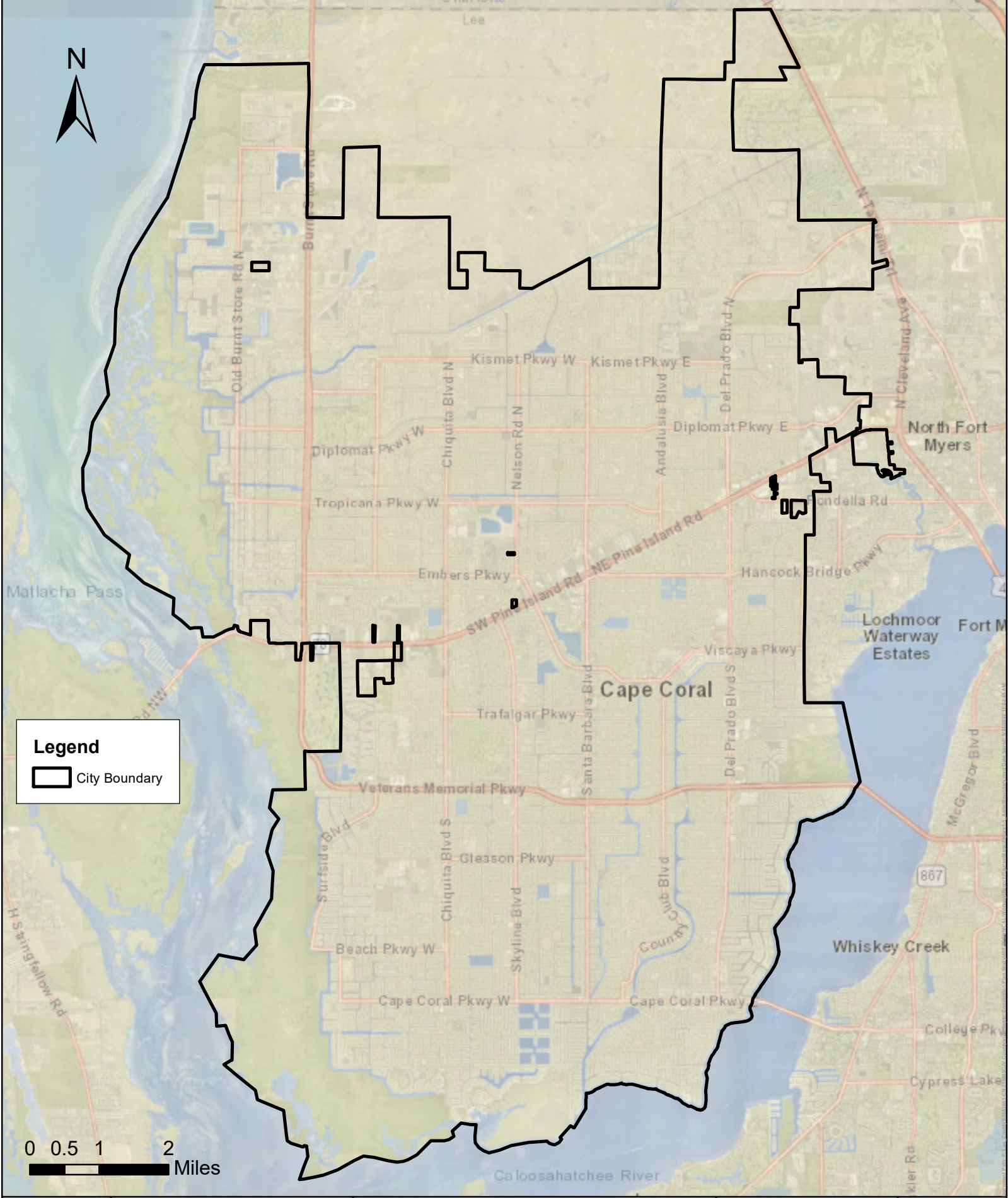
*The Comprehensive Master Plan will provide direction to identify near, mid, and long-term infrastructure management strategies and capital improvement programs to maintain regulatory compliance and to provide system improvements that can reliably meet existing and future customer needs.*



## 1.1 Background

The City of Cape Coral (City), developed in the 1950s and incorporated as a city in 1970, is one of the nation's fastest growing communities. Situated in southwest Florida on a large peninsula, the City of Cape Coral (City) consists of an area of over 120 square miles (76,000 acres) with 10 square miles being comprised of water. The peninsula holds over 400 miles of fresh and saltwater canals which ultimately open into the Gulf of Mexico and its tributaries. The City borders the Caloosahatchee River in the south and east, the Matlacha Pass in the west, and connects to the Florida mainland in the north by Charlotte County and North Fort Myers. The City of Fort Myers is accessible by crossing the Caloosahatchee River whereas Pine Island is accessible by crossing Matlacha Pass. The City boundary is illustrated in **Figure 1-1**.





The City attracts seasonal residents during the winter months of the year by means of its subtropical climate, which is characterized by mild weather. With the existence of the area's unique network of canals, the City is quickly becoming a popular vacation and retirement community.

The largest estimates of City population show that the year-round population in the year 2020 is 197,818 as of August of the same year. The population has increased at an annual rate of approximately 3% over the past decade.

The City owns and operates potable water, wastewater, and irrigation quality (IQ) water systems. The City Utilities Department provides the overall management of utilities operations to safely provide outstanding drinking water, reuse irrigation, and sewer service to the City's residents. The Department is responsible for the management and enhancement of utilities capital assets and to ensure that all regulatory conditions and mandatory requirements are met.

The City's Utilities Department mission is to continuously improve delivery of cost-effective water, irrigation water, and wastewater collection services by empowering employees to responsively meet customer expectations for quality, value, safety, reliability, and environmental responsibility.

Over the years, various engineering reports, plans and documents have been prepared to outline a phased program of infrastructure improvements to expand utility services to the residents of Cape Coral. However, as the City continues to grow, an updated comprehensive potable water, wastewater, irrigation quality water and supporting utilities master plan is needed. The City Utilities Department retained AECOM Technical Services, Inc. (AECOM) to provide professional engineering services for development of a Comprehensive Utilities Master Plan Update.

## 1.2 Previous Plans and Studies

In 1988 the City of Cape Coral completed an initial study to evaluate alternative water supplies referred to as "The W.I.C.C Plan" (Water Independence of Cape Coral). The W.I.C.C. Plan recommended that the City provide three utility services: potable water, wastewater, and irrigation as well as supply sources. It determined that the brackish Upper Floridan Aquifer would provide raw water for potable water and that reclaimed water from the Water Reclamation Facilities and fresh water from the canals be utilized for irrigation.

Several Master Plan and Facilities Plan Updates occurred following the 1988 W.I.C.C. Plan. In 1991 Camp Dresser and McKee Inc. completed a 201 Facilities Plan Update. Both the W.I.C.C



Plan and the 201 Facilities Plan Update were used to help secure low interest loans from the State of Florida to initiate the Utility Extension Program. A Utility Master Plan Update was completed in 1999 by Dames and Moore and Black and Veatch which evaluated alternative water supplies and various options to extend public sewer to the Cape Coral residents. In 2004 a Facility Expansion Program study was completed by MWH Inc. to identify potable water and wastewater treatment capacity needs over a 20-year planning horizon and buildout conditions. The recommendations from this program resulted in expansions to the Everest WRF (to 13.4 MGD), the SW WRF (to 15 MGD), the Southwest RO facility (to 18.1 MGD) and construction of a new North RO facility (12.0 MGD).

Master Plan updates were completed in 2007 and 2009 and Facilities Planning Updates occurred in 2012 and 2016.

In the preparation of this Master Plan, the results and findings from several other past reports have been considered and incorporated. The key studies and reports that provided an insight to this Master Plan include the following:

- Greeley and Hanson Alternative Wastewater Systems Study dated 2007
- MWH City of Cape Coral Irrigation Master Plan (Irrigation and ASR) dated 2011
- Black and Veatch Reuse Water Infrastructure Feasibility Study dated 2013
- City Utility Department Integrated Water Resource Management Plan dated 2014
- CDM Smith Technical Memorandum – Hydraulic Modeling for Potable Water Extension to Cape Coral's North 2 Area dated 2015
- CDM Smith Technical Memorandum – Hydraulic Modeling of the City's North 2 Area Wastewater Collection and Conveyance System dated 2015
- Southwest Florida Regional Planning Council Cape Coral Climate Change Vulnerability Assessment dated 2016
- Tetra Tech Irrigation Supply Study for Utilities Extension Program Southwest 6 & 7 dated 2016
- Tetra Tech Northeast Irrigation Reservoir Basis of Design dated 2016
- Water Science Associates City of Cape Coral Utilities Pilot Pumping Test of the Southwest Aggregates Reservoir dated 2017
- City of Cape Coral 2017 Water Supply Facilities Work Plan
- South Florida Water Management District Lower West Coast Water Supply Plan Update dated 2017
- Stantec FY 2020 Utility Revenue Sufficiency Analysis Final Report dated 2020

## 1.3 Project Vision

The City's vision for the Master Plan is to develop a dynamic comprehensive plan for delivering outstanding potable water, wastewater, and irrigation quality water services. The City's goal for the Master Plan is to identify system improvements that will provide sufficient system capacity to meet projected demands and to provide reliable service while meeting all regulatory requirements to provide the required level of service. The Master Plan will be used by the City as the basis for Future Facility requirements, Utility Extension Program (UEP) Areas, Capital Improvements Plan, and Planning and System Operations. Recommendations provided in the Master Plan will allow the City to maintain a high level of reliability and efficiency for current demand, future growth, and emergency situations.

## 1.4 Data Collection

Existing information was collected and reviewed for the development of the Master Plan and a document management system was established to summarize the available information. The existing information includes previous studies and master planning documents; operational data and permits; basis of design documentation and record information for existing potable water, wastewater and irrigation quality water systems; annual reports for potable water, irrigation quality water and wastewater systems; shapefiles and GIS geodatabase for the City's Public Utilities; and the hydraulic models for the City's potable water distribution, wastewater conveyance, and irrigation quality water distribution systems.

## 1.5 Project Tasks and Approach

AECOM developed a project approach and scope of services for the Master Plan with the overall objective of providing the direction needed to identify near, mid, and long-term infrastructure management strategies and capital improvement programs to maintain regulatory compliance and to provide system improvements that can reliably meet existing and future customer needs. The scope of services for this work is organized into thirteen (13) Tasks as summarized below and detailed herein. **Figure 1-2** demonstrates the approach developed for the Master Plan. The Master Planning Project was completed under the following major tasks:

- Data collection and review of existing background reports, studies, and operating data (Task 2)
- Water resource evaluation (Task 3)
- Evaluation of population trends and demands and flow projections for potable water, wastewater, and irrigation quality water (Task 4)

- Evaluation of the existing treatment capacity for potable water, wastewater, and irrigation quality water and gap Analysis (Task 5)
- Hydraulic modeling to determine needed potable water, wastewater, and irrigation quality water infrastructure improvements (Task 6)
- Evaluation of New MPS 100 Catchment Area (Task 7) Note: The results of this evaluation were provided in a separate report and therefore not included herein
- Document level of service (LOS) standards for alternative improvements (Task 8)
- Develop and rank alternative improvements (Task 9)
- Capital project identification and project prioritization (Task 10)
- Develop financial plan (Task 11)
- Prepare final report and presentation (Task 12)
- Evaluation of North 1 UEP (Task 13)

**Figure 1-2: Master Plan Approach**

