

## **APPENDIX “G”**

### **Hendry County Utility Master Plan - Level 1 Technical Memorandum**

# Hendry County Utility Master Plan - Level 1 Technical Memorandum

## **Hendry County**

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# Abbreviations and Acronyms

BEC .....	Boyle Engineering Corporation
FDEP .....	Florida Department of Environmental Protection
MG .....	million gallons
MGD .....	million gallons per day
MMADF .....	maximum month average daily flow

# References

Hendry County Comprehensive Plan, LaRue Planning & Management Services, Inc., Adopted March 5, 1991, Amended November 9, 1999

Hendry County Utilities Design and Construction Standards Handbook, Port Labelle Utilities System, March 2004

West LaBelle Land Use Study, Hendry County Board of County Commissioners, Coastal Engineering Consultants, Inc., April 22, 2004.

# Executive Summary

Land uses and economy in Hendry County have historically been dominated by agricultural activities. Recently, numerous applications have been filed with the Hendry County Planning and Zoning Department for converting land use from agricultural to residential in the northwestern corner of the County. This area is referred to as the West LaBelle study area, and generally follows the State Road (SR) 90/Caloosahatchee River corridor from the Lee County line to the City of LaBelle corporate limits.

Central water and sewer facilities are critical to the development of the study area. Boyle Engineering Corporation was retained by Hendry County to evaluate projected growth in the West LaBelle area, and to identify strategies for coordinating the resolution of water and wastewater needs in the study area with regional growth issues.

General recommendations include:

- ?? Establish a Regional Utility Authority to manage current and projected water/wastewater needs. The authority may include representatives of one or more of the following: Hendry County, City of LaBelle, City of Clewiston, Glades County, Port LaBelle Utilities, and South Shore Utilities.

The Authority would coordinate the resolution of immediate needs in the West LaBelle area with future regional requirements. Advantages include economies of scale for owning/operating water and wastewater facilities, and increased “political clout” for securing project funding.

- ?? Conduct a Master Utility Study to include all areas represented by the Regional Authority. The intent is to maximize the use of existing water and wastewater facilities, and to supplement the existing facilities with new regional facilities that would take into consideration both the West LaBelle and regional growth patterns.
- ?? Initiate discussions with the South Florida Water Management District about regional water resource needs. Issues may include conceptual water/wastewater plans, proposed water withdrawal permits, land requirements for new facilities, reclaimed water issues, and available funding.
- ?? Adopt utility design and construction standards for use by private developers.
- ?? Perform a Regional Irrigation Distribution System (RIDS) study for Hendry County to evaluate alternative water sources, including reclaimed water, for urban irrigation.

# 1.0 Introduction

## 1.1 Project Description

Hendry County is located in Southwest Florida, and shares land boundaries with Broward, Charlotte, Collier, Glades, Lee, and Palm Beach Counties. Only Lee County separates Hendry County and the Gulf of Mexico, and only Palm County separates the County and the Atlantic Ocean.

The Caloosahatchee River traverses the northwest corner of the County, and the northeast corner of the County forms part of the south shoreline of Lake Okeechobee. The Big Cypress Seminole Indian Reservation lies in the southeast portion of Hendry County.

Hendry County is a rather large county geographically (approximately 1,185 square miles), but has a comparatively small population. The United States Bureau of the Census estimates the population was 36,699 in year 2001.

Most of the population of Hendry County is concentrated in and around the incorporated cities of LaBelle and Clewiston. Refer to Figure 1. Land uses and economy have traditionally been dominated by agricultural activities.

The conversion of agricultural and vacant land to residential uses has become prominent in Southwest Florida. This rapid development of agricultural land has placed strains on the area's infrastructure. Hendry County, in anticipation of future development, has divided the County into six (6) Utility Zones (ref., Figure 2). The zones were established by the County to facilitate countywide (regional) planning. The zones correlate to the anticipated development/growth trends within the County (i.e., progressively 1 through 6).

Numerous land use petitions have recently been filed for conversion of agricultural land to residential uses in a portion of Hendry County typically referred to as the "West Labelle" area. The West Labelle area is described as all land west of the LaBelle corporate limits to the Lee/Hendry County line, and generally follows the SR80/Caloosahatchee River corridor (ref., Figure 3).

The West LaBelle area correlates to Utility Zone 1. As Figure 3 illustrates, the zone overlaps portions of Lee and Glades Counties for planning purposes.

Boyle Engineering Corporation (BEC) was retained to perform an evaluation of the projected growth in this area, and to make recommendations for addressing the County's existing and future water and wastewater needs.

## **1.2 Project Authorization and Scope of Services**

BEC's scope of services, as identified by the County, for this project were limited to the following activities:

### **A. PHASE I: WATER SUPPLY AND WASTEWATER**

#### **Task A1 – Review Existing Documents**

Existing resources will be reviewed to determine the information available to prepare water demands and wastewater projections. This information will be summarized along with any data gaps that will be required in subsequent phases.

1. Review applicable portions of West LaBelle Land Use Study, Hendry County Comprehensive Plan, City of Labelle Comprehensive Plan, Lee & Glades Counties Comprehensive Plans, and other pertinent documents.

#### **Task A2 - Meetings**

1. Meet with stakeholders to define objectives, receive input, develop a schedule and promote partnering.
2. Meet with stakeholders to present findings and recommendations. Comments will be reviewed and incorporated, if necessary.

#### **Task A3 – Water Utility Planning for Zone 1**

1. Prepare a map of Hendry County showing location of existing water treatment facilities, water service area boundaries, and unserved areas.
2. Develop a range of projected potable water demands for Zone 1 based on available population and land use data.
3. Document current water supply sources / facilities and their current permitted capacity or yield.
4. Review the County's current water supply plan with South Florida Water Management District and in accordance with the District's Lower West Coast Water Supply Plan.
5. Identify potential infrastructure locations such as regional well or river intake locations and distribution systems.
6. Identify the key water resource and water supply issues confronting Hendry County and provide recommendations on how to proceed with addressing these issues.

**Task A4 – Wastewater Utility Master Plan for Zone 1**

1. Prepare a map of Hendry County showing location of existing water treatment facilities, water service area boundaries, and unserved areas.
2. Develop wastewater flow projections.
3. Review existing wastewater treatment facility permitted capacities.
4. Document current wastewater treatment plant (WWTP) effluent treatment criteria and regulatory compliance with the effluent standards.
5. Identify potential infrastructure locations such as spray fields locations and collection systems.
6. Identify the key wastewater system issues confronting Hendry County and provide recommendations on how to proceed with addressing these issues.

**Task A5 – Evaluate Available Funding**

1. Prepare a list of funding sources that the County can elect to pursue in the future.

**Task A6 – Technical Memorandum (Deliverable 1)**

1. Prepare draft and final technical memorandum presenting the results of Tasks A1-A5.

# 2.0 Land Use and Population

## 2.1 Background

The West LaBelle Land Use Study (April 22, 2004) included a population projection for Hendry County based on data provided by The Bureau of Economic and Business Research (BEBR) at the University of Florida. The projection suggests that the population will more than double by the year 2030. However, the Study did not contain a population projection for the West LaBelle study area. Population projections will be developed based on future land uses.

## 2.2 Future Land Use

Current land use in the West LaBelle area is predominantly agricultural. Residential uses only comprise approximately fourteen percent (14%) of the land area.

Based on a review of *Subdivision Plat Review Applications, Applications for Rezone, and Comprehensive Plan Amendment Applications* filed with the Hendry County Planning and Zoning Department, future land use categories in the area will be mainly residential. This is consistent with findings in the West LaBelle Land Use Study.

## 2.3 Population Projections

Population projections for the study area were estimated based on the proposed future land uses identified in the West LaBelle Land Use Study. The projections were performed by RWA Consulting, Inc., and were based on maximum achievable densities and a buildout date of 2030.

### .2.3.1 Population Projections - West LaBelle Study Area

Year	2005	2010	2015	2020	2025	2030
Population	10,000	14,450	20,850	30,050	43,350	62,546

A copy of the analysis is included as Attachment 1.

## **2.4 Other Considerations**

It is projected that the development trend will continue west to east, along both the SR80/Caloosahatchee River corridor in northern Hendry County and the SR78/Caloosahatchee River Corridor in southern Glades County. Developments are also currently being proposed for Zone 3.

The existing populated areas in Hendry County, along with projected growth in Hendry County and adjacent counties, should all be considered in a regional utility study.

# 3.0 Water Utility Planning for Zone 1

## 3.1 Existing Water Supply Sources and Facilities

The majority of the land area in Hendry County is served by individual wells. Central potable water systems include the City of Clewiston, the City of LaBelle, Port LaBelle, and the South Shore Water Association.

The Clewiston and South Shore Water Association do not have treatment systems, but purchase potable water for resale and distribution from the U.S. Sugar Corporation. The U.S. Sugar Corporation operates its treatment facility in the Clewiston area, and also provides potable water for its own sugar refining operations. The LaBelle and Port LaBelle water treatment and distribution systems are adjacent and/or in proximity to the study area, and will be further discussed.

The LaBelle and Port LaBelle WTP's utilize the shallow and sandstone aquifers, respectively, for water sources. In addition, 78 water use permits (WUP) have been issued and/or are pending review within the West LaBelle area (ref., Figure 4).

The City of LaBelle's water treatment plant (WTP) has a capacity of 1.0 million gallons per day (mgd), and distributes potable water within the City limits and to limited areas outside the City. The WTP is reportedly at the end of its useful life, and the City is planning on replacing the facility with a new WTP.

The County acquired the Port LaBelle WTP from General Development Utilities in the 1990's. The system serves the Port LaBelle community, and has the responsibility to provide water for the community's build-out capacity. The WTP has a design treatment capacity of 0.5 mgd, and plans are currently being developed to expand the capacity to \_\_\_\_ mgd.

As with Hendry County, the majority of the West LaBelle area is currently being served by individual wells or small potable water systems serving specific sources (i.e., RV parks, mobile home parks, etc.).

Reclaimed water is currently not available in the study area. Individual water use permits have been obtained for agricultural uses, and potable water is also being utilized for urban irrigation.

## 3.2 Water Demand Projections

Potable water projections are typically calculated using annual average daily water demands (AADD). A peaking factor is applied to the AADD to calculate the maximum daily demand (MDD). Water treatment system designs are generally based on the MDD.

An AADD of 125 gallons per day (gpd) and a peaking factor of 1.45 will be used to estimate water demands for the West LaBelle study area. These figures are consistent with both the *Hendry County Comprehensive Plan* and the *City of LaBelle Comprehensive Plan*.

### .3.2.1 Projected West LaBelle Water Demands

Year	Population	Water AADD (gpd)	Water MDD (gpd)
2005	10,000	1,250,000	1,812,500
2010	14,450	1,806,250	2,619,062
2015	20,860	2,607,500	3,780,875
2020	30,050	3,756,250	5,446,562
2025	43,350	5,418,750	7,857,188
2030	62,546	7,818,250	11,336,462

The water demands are based on maximum achievable densities and a buildout date of 2030. Refer to Section 2.3, Population Land Use.

### 3.3 Recommendations

- ?? Establish a regional water authority to address current and projected water resource needs. The authority may include representatives of one or more of the following: Hendry County, City of LaBelle, City of Clewiston, Glades County, Port LaBelle Utilities, and South Shore Utilities.
- ?? Analyze proposed development trends in both the LaBelle Study area (Utility Zone 1) and the remainder of the Utility Zones. The intent is to combine immediate relief for current developments with economical, long-term water resource planning.
- ?? Water service to the West LaBelle study area should be coordinated with planned expansions of existing facilities adjacent to and/or in proximity to the area, and should consider anticipated regional growth.
- ?? Refer to Figure 5 for conceptual water treatment plant and distribution system locations. The ultimate solution may include a combination of upgrading existing facilities and constructing new facilities to meet both current needs within the study area and projected regional needs.
- ?? Potential sites for new facilities include properties owned by the SFWMD. Discussions should be initiated with the SFWMD for transferring ownership of the property(ies) to a Regional Authority.
- ?? Establish and implement utility design and construction standards for use by private developers in Hendry County. This will ensure that “utility grade” materials and construction standards are being used by developers in anticipation of a Regional Authority ultimately taking ownership of the water systems.
- ?? Perform a Regional Irrigation Distribution System (RIDS) study for Hendry County consistent with the SFWMD’s *Lower West Coast Water Supply Plan* (April 2000) and the *Master Plan for the Regional Irrigation Distribution System for the Lower West Coast Region* (December 2002). The study will determine the amount of water that will be necessary from alternative sources for future urban irrigation, and identify potential alternative water sources.

# 4.0 Wastewater Utility Planning for Zone 1

## 4.1 Existing Wastewater Facilities

The majority of the land area in Hendry County is served by on-site septic treatment systems. Small package treatment plants are also located throughout the County, and provide treatment for private development (i.e., RV parks, mobile home parks, etc.).

Central sewer facilities are located in Clewiston, LaBelle, and Port LaBelle. The LaBelle and Port LaBelle facilities are adjacent and/or in proximity to the study area, and will be further addressed.

The sanitary sewer system in the City of LaBelle has a permitted treatment capacity of 0.75 mgd, and is reportedly operating at approximately one-third of its capacity. Septic systems are also currently being used within the City limits.

The Port LaBelle system is owned by Hendry County, and is responsible for serving the build-out population of the Port LaBelle community. The design capacity of the facility is 500,000 gallons per day (gpd).

As with Hendry County, the majority of the West LaBelle area is currently being served with on-site septic treatment systems, or small package treatment plants for private developments.

## 4.2 Wastewater Flow Projections

Wastewater projections are typically based on equivalent residential connections (ERC's). The population projection for the study area assumed two (2) persons per household. The same ratio will be applied to the population projections to calculate the ERC's. A typical flowrate of 155 gallons of wastewater per day per ERC will be used to estimate wastewater flows.

#### **.4.2.1 Projected West LaBelle Wastewater Flows**

<b>Year</b>	<b>Population</b>	<b>ERC's</b>	<b>Wastewater Flow (gpd)</b>
2005	10,000	5,000	775,000
2010	14,450	7,225	1,119,875
2015	20,860	10,430	1,616,650
2020	30,050	15,025	2,328,875
2025	43,350	21,675	3,359,625
2030	62,546	31,273	4,847,315

#### **4.3 Recommendations**

- ?? Establish a Regional Utility Authority to address current and projected wastewater collection and treatment needs. The authority may include representatives of one or more of the following: Hendry County, City of LaBelle, City of Clewiston, Glades County, Port LaBelle Utilities, and South Shore Utilities.
- ?? Analyze proposed development trends in both the LaBelle Study area (Utility Zone 1) and the remainder of the Utility Zones. The intent is to combine immediate relief for proposed developments with economical, long-term planning.
- ?? Wastewater service in West LaBelle study area should be coordinated with planned expansions of existing facilities adjacent to and/or in proximity to the area, and should consider regional growth.
- ?? Refer to Figure 5 for conceptual wastewater facility locations. The ultimate solution may include a combination of upgrading existing facilities and constructing new facilities within and/or in proximity to the study area.
- ?? Potential sites for new facilities include properties owned by the SFWMD. Discussions should be initiated for transferring ownership of the property(ies) to a Regional Authority.

- ?? Immediate relief in the West LaBelle area may include construction of interim package treatment plants by developers, which could ultimately be converted to lift stations to pump sewage to a regional wastewater treatment facility.
- ?? Establish and implement utility design and construction standards for use by private developers in Hendry County. This will ensure that “utility grade” materials and construction standards are being used by developers in anticipation of ultimately turning over the systems to a Regional Authority.

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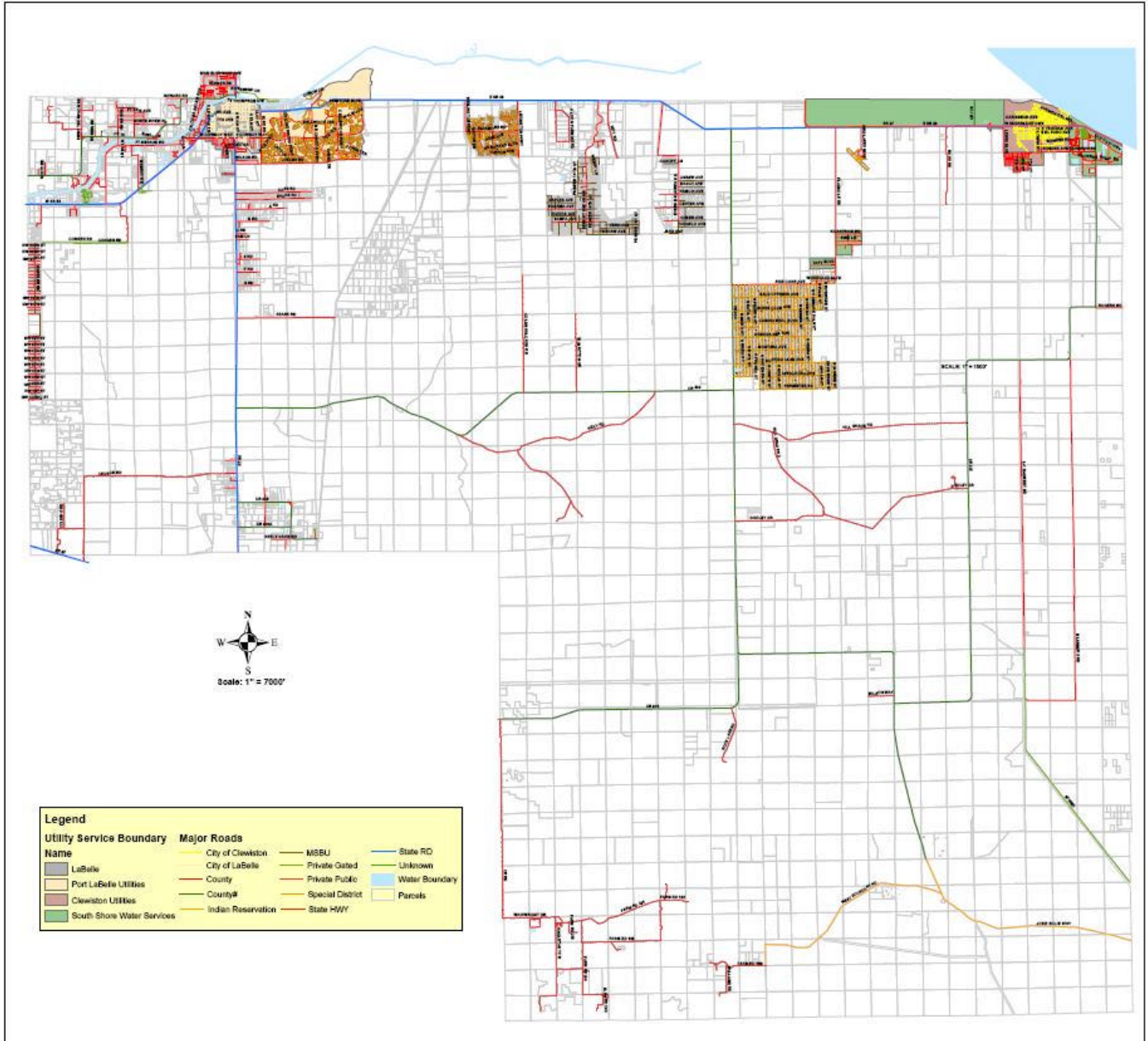
# 5.0 Funding

Potential sources of funding for water, wastewater, and reclaimed water projects include, but are not limited to, the following:

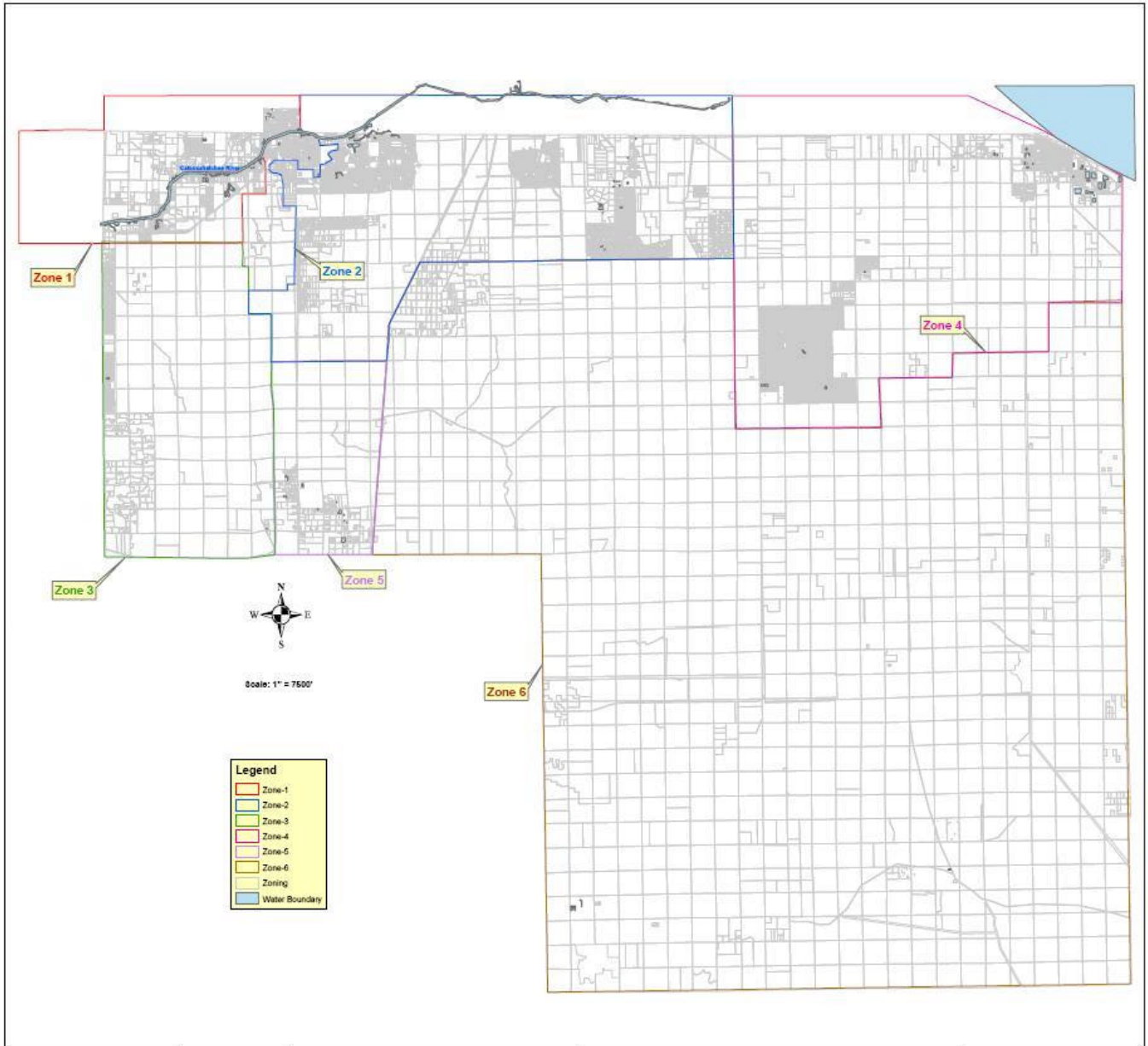
- ?? Florida Department of Environmental Protection (FDEP) State Revolving Fund Loan Program for Wastewater and Stormwater provides low-interest loans for planning, designing, and constructing water pollution control facilities.
- ?? FDEP State Revolving Fund Loan Program for Drinking Water provides low-interest loans for planning, designing, and constructing public water facilities
- ?? South Florida Water Management District (SFWMD) Alternative Water Supply Grant Program provides the potential for the development of alternative water supplies and to assist utilities develop cost-effective reclaimed water supplies
- ?? SFWMD Water Resources Development Program provides for implementation of water resource development projects as prioritized in its regional water supply plans.
- ?? The Community Development Block Grant Program provides for Neighborhood Revitalization project funds that may be used for drinking water, stormwater, and wastewater projects.
- ?? The Water Quality Improvement and Water Restoration Grant Program (Section 403.885 F.S.) provides appropriations for projects that address resolving violations of state water quality standards, preventing drainage and flood control problems, resolving public health threats, and protecting the environment.
- ?? EPA State and Tribal Assistance Grants provide funds for special water supply projects through its State and Tribal Assistance Grant (STAG) program.
- ?? Projects can be funded in partnership with other public or private entities.
- ?? Projects can also be funded by the issuance of bonds. However, this is generally considered the final funding option due to costs of issuance, interest rates, coverage, and other financial considerations.

Regardless of the funding options pursued, projects that address regional water resource needs are generally prioritized. In addition, regional facilities are generally more cost effective due to economies of scale and combined administrative and operating/maintenance costs.

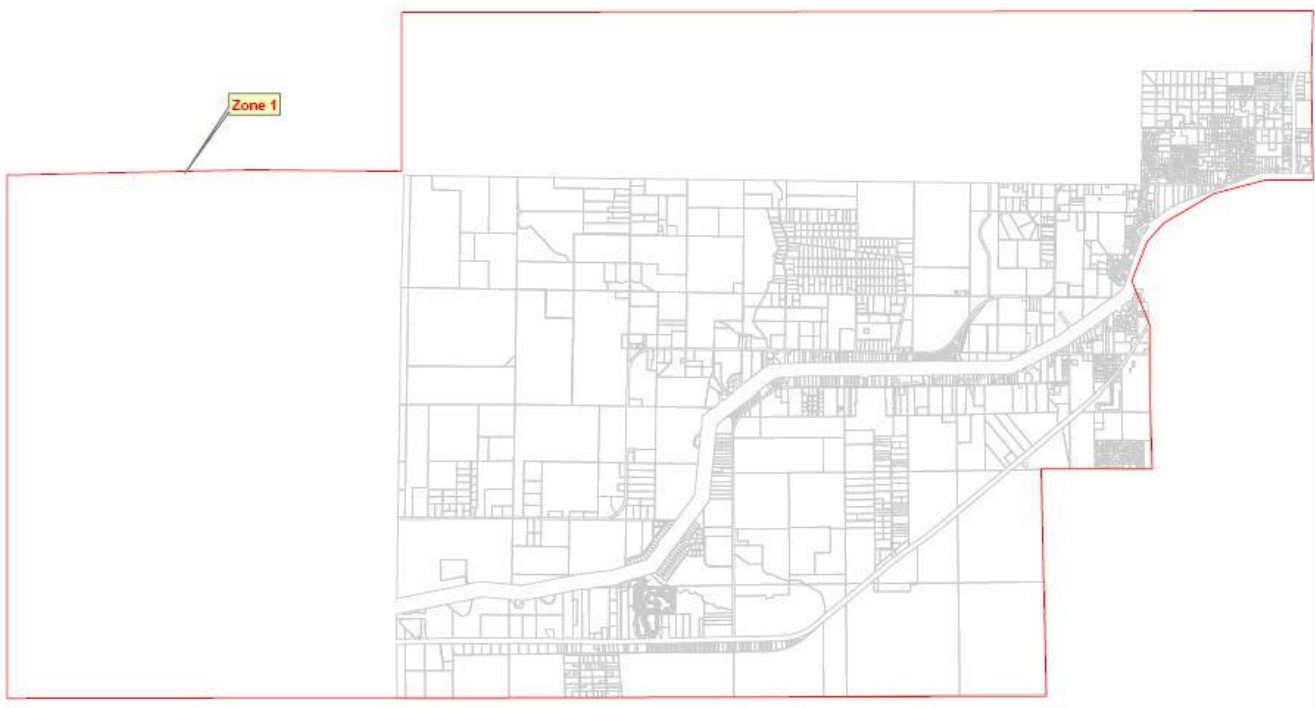
The SFWMD will “surplus” land for public water/wastewater projects. Conceptual locations for new water/wastewater facilities include properties currently owned by the SFWMD (refer to Figure 5).



West Labelle Utility Study		Hendry County	Existing Utility Service Areas	Figure No. 1
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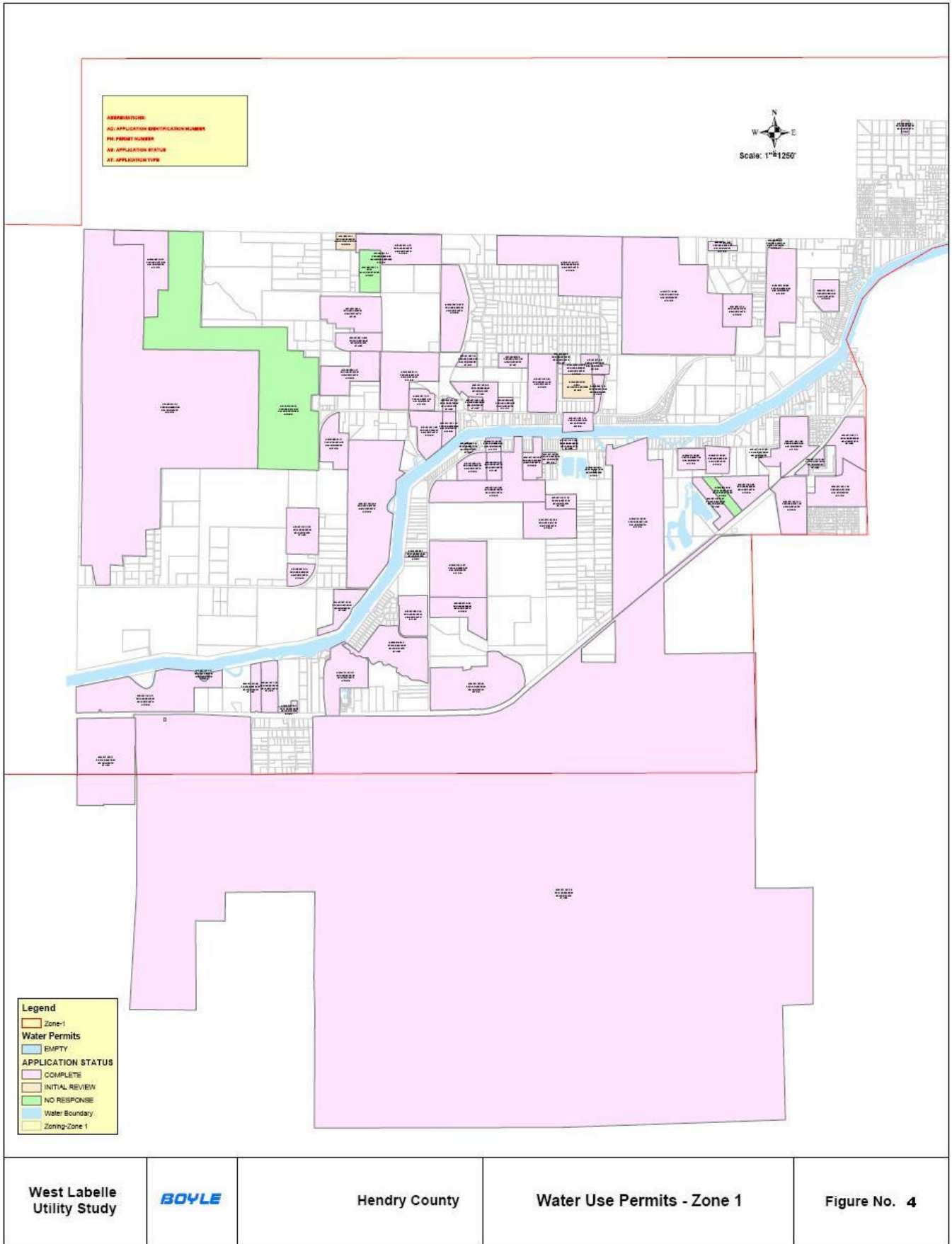


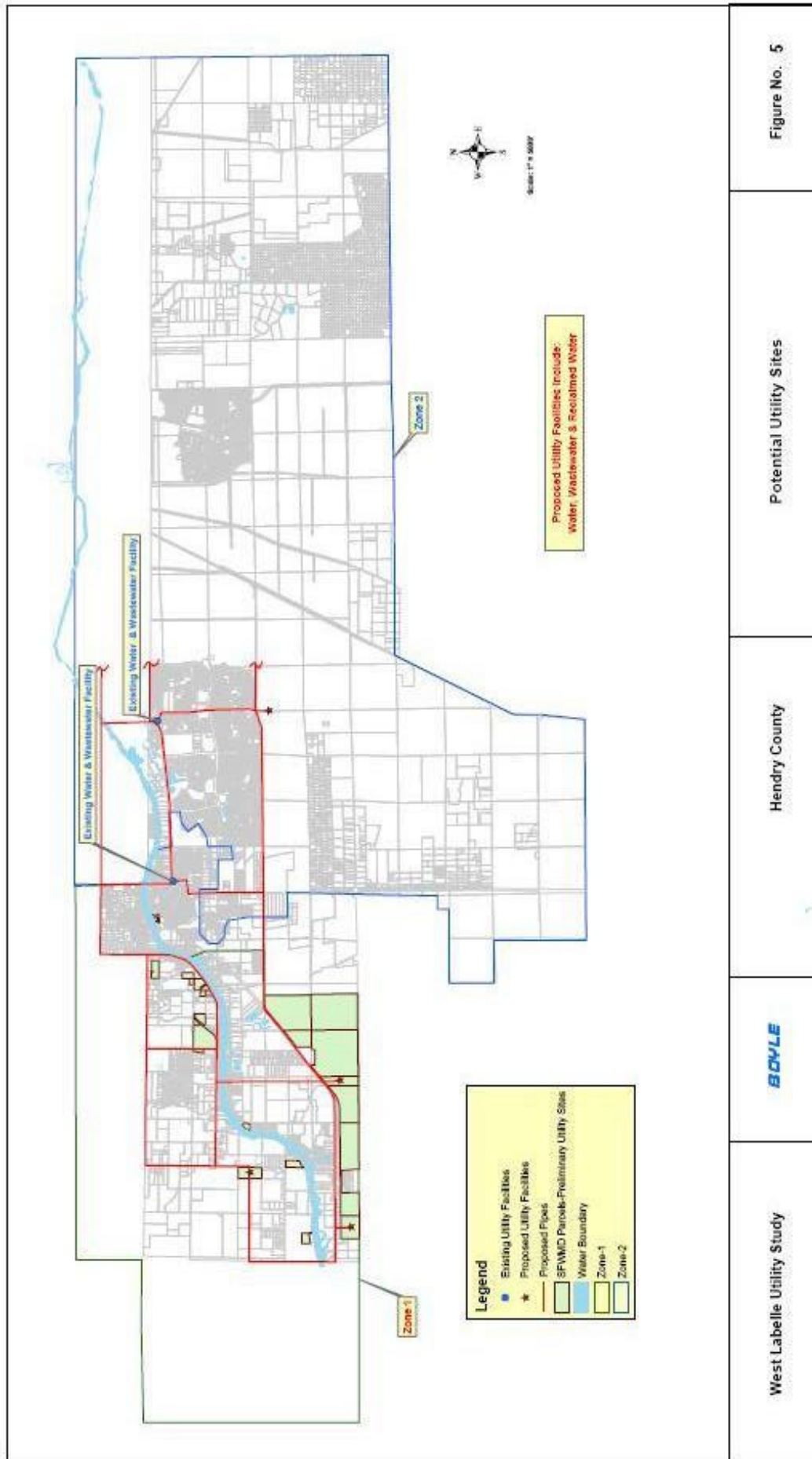
West Labelle Utility Study	<b>BOYLE</b>	Hendry County	Proposed Utility Zones	Figure No. 2
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Legend  
Zone-1

West Labelle Utility Study	<b>BOYLE</b>	Hendry County	Proposed Utility Zone - 1	Figure No. 3
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West Labelle Utility Study

**BOYLE**

Hendry County

Potential Utility Sites

Figure No. 5