Gulf Coast Region Water Quality Management Plan Update: 2009

"To promote the preservation, protection, and enhancement of ground water and surface water quality through coordination and integration of water quality programs in the 13-county Gulf Coast Region."

Houston--Galveston Area Council
Water Quality Management Program Mission Statement

DRAFT

June 2009

PREPARED IN COOPERATION WITH THE
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY AND
U.S. ENVIRONMENTAL PROTECTION AGENCY

The preparation of this report was financed through grants from the U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality (Grant Number **C6 - 48000040**)

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Introduction

Over seventy-five percent of the classified streams in the Houston metropolitan region do not meet State water quality standards because they are severely polluted. The National Water Quality Assessment (NAWQA) study conducted by the United States Geological Survey (USGS) indicates that contaminants from point and non-point sources will continue to impair the nation's streams and ground water resources well into the foreseeable future. These contaminants pose health risks to aquatic and human life and adversely impact ecosystems. (United States Geological Survey, 2003). Forecasts suggest that the population of the Houston-Galveston metropolitan region will increase by 3.5 million inhabitants by the year 2035. The resulting urban growth will put pressure on the region's water resources and affect land and aquatic ecosystems. The Houston-Galveston Regional Water Quality Management Plan (WQMP) addresses the water quality issues that affect the Texas Upper Gulf Coast region in the effort to reduce water pollution and to preserve, protect and enhance the quality of the region's surface and ground water resources. The WQMP is the product of a wastewater treatment infrastructure planning process developed and updated in compliance with the provisions of Sections 205(j), 208, and 303 of the Federal Clean Water Act (CWA), (as amended), and is an important part of the State's program for reaching its clean water goals. The Houston-Galveston Regional Water Quality Program mission is to

1. Protect the region's water resources
2. Improve water quality, and
3. Ensure the quality of habitats and estuaries

These planning goals underlie H-GAC's efforts to implement effective watershed management strategies in order to lower pollution in waterways of its Gulf Coast Water Quality Planning Region.

The H-GAC Gulf Coast Water Quality Management Planning Region follows the southeast Texas Gulf coastline from Bolivar Island to Palacios, reaching inland to the piney woods of Huntsville and Lake Livingston in the north and extending from Winnie in the east through Columbus to Weimar in the west. The region covers an area of approximately 12,500 square miles and encompasses 13 counties - Austin, Brazoria, Chambers, Colorado, Fort Bend, Galveston, Harris, Liberty, Matagorda, Montgomery, Walker, Waller, and Wharton. The Clean Water Act requires that the WQMP be updated as needed to fill information gaps and to revise earlier certified and approved plans. Any updates to the plan need include only the elements of the plan that are new or require modification. The WQMP is tied to the State's water quality assessments that identify priority water quality problems. WQMP Updates are used to guide planning for implementation measures that control and/or prevent water quality problems. This document will become part of the State WQMP after completion of its public participation process, certification by the TCEQ on behalf of the Governor of Texas, and approval by the Environment Protection Agency (EPA).

The 2009 update to the Houston-Galveston Regional Water Quality Plan (WQMP) addresses the wastewater treatment plant expansion needs over the next twenty years for selected service districts in the planning region. The service districts considered in this update have some of the oldest treatment plants and wastewater collection systems in the region, with an average age over thirty-two years. The selection of the region's oldest plants for assessment in this update recognizes the pollution risks associated with an aging wastewater collection and treatment infrastructure. It also offers an opportunity to explore the possibilities of consolidating treatment plant operations into larger, more efficient and environmentally safe establishments. Table 1 lists the stream segments that receive effluents from the treatment plants assessed in this update.

The section that discusses service area populations for wastewater treatment facilities is based on information obtained from the TCEQ, utility districts, municipalities and H-GAC's internal forecast programs. Wastewater facility needs were determined using flow data obtained from EPA's Permit Compliance System (PCS) online database while population projections generated internally by H-GAC forecast programs. Population forecasts for individual wastewater service districts and the future needs for wastewater treatment facility construction or expansion for the next twenty years are found in Table 2. Current and forecast WWTP flow data are available from H-GAC upon request.

This update revises only the information specifically addressed in the included sections. Previously certified and approved water quality management plans remain in effect.

TABLE 1: Stream Segments which receive treatment plant effluent from assessed wastewater service districts.

SEGMENT		STREAM
801		Trinity River
802		Trinity River below Lake Livingston
901		Cedar Bayou Tidal
1001		San Jacinto River Tidal
1004		West Fork San Jacinto
1006		Houston Ship Channel
1007		HSC/Buffalo Bayou Tidal
1008		Spring Creek
1009		Cypress Creek
1014		Buffalo Bayou Above Tidal
1016		Greens Bayou Above Tidal
1017		White Oak Bayou
1101		Clear Creek Tidal
1105		Bastrop Bayou
1109		Oyster Creek Tidal
1113		Armand Bayou
1201		Brazos River Tidal

TABLE 1 Continued:

SEGMENT		STREAM
1202		Brazos River below Navasota
1245		Upper Oyster Creek
1301		San Bernard Tidal
1302		San Bernard Above Tidal
1402		Colorado River Below La Grange
1501		Tres Palacios Creek Tidal
1502		Tres Palacios Creek Above Tidal
2425		Clear Lake
2426		Tabbs Bay
2431		Moses Lake
2441		East Matagorda Bay
2452		Tres Palacios Bay/Turtle Bay

COORDINATION

Overview

Water quality management programs often involve a series of inter-related environmental initiatives with overlapping concerns and solutions. These initiatives are typically designed and implemented at the level of the watershed. Watershed management is a concept that encourages an orderly and comprehensive approach to the use and development of natural resources within the watershed. H-GAC is committed to preserving, protecting and enhancing ground and surface water quality through its efforts to coordinate and integrate water quality programs within its planning region. H-GAC's involvement in these diverse programs includes hands-on participation by H-GAC staff, hosting or conducting public education and awareness sessions, overseeing data collection, analysis and publication, coordinating the activities of stakeholders, providing technical support to the planning process or grant administration for the water quality management projects or initiatives. The Natural Resources Advisory Committee (NRAC), a select group of representatives from local government, industry, business and citizen groups, advises the H-GAC Board on matters relating to the environment and natural resources.

The Clean Rivers Program (CRP)

A Coordinated Ambient Water Quality Monitoring Strategy

Section 303(d) of the Clean Water Act (CWA) and Environmental Protection Agency (EPA) regulations (40 DFR 130.7) require that all States identify water bodies that do not or are not expected to meet the water quality standards for their designated uses. These water bodies are then added to what is referred to as the 303(d) list. The State prioritizes water bodies on the list in order to schedule Total Maximum Daily Load (TMDL) development. The WQMP is tied to the State's continuous water quality assessment efforts which identify water quality problems that require priority action. As part of this effort, H-GAC, in partnership with local, regional and federal agencies gathers and compiles water quality data and other related information as requested by the TCEQ. Upon certification that the data collected meets the State's minimum quality assurance and quality control requirements, the data is used to evaluate water quality conditions to determine if a water body may be considered impaired and whether a Total Maximum Daily Load (TMDL) or some other management action is required

The H-GAC planning region has over 16,000 miles of waterways flowing through it and contains several large fresh water lakes which supply the Houston metropolitan region and its environs with drinking water. The region also boasts of estuarine systems with high quality aquatic habitats which make the region one of the most productive in the country. These water resources furthermore provide recreational opportunities such as camping, boating, canoeing, swimming and fishing to residents of the area. The principal aim of the Texas Clean Rivers Program is to protect water quality which will ensure the availability of safe, clean water supply both now and for future generations.

Keeping track of the status and trends of water quality across the region requires the concerted effort of several stakeholders. As the lead assessment agency, H-GAC coordinates a regional ambient surface water quality monitoring regimen involving six local government agencies. These partner agencies collect water quality data for over 300 different sites across the region. H-GAC also maintains a regional water quality database for four river basins – the San-Jacinto River Basin, the Trinity-San Jacinto Coastal Basin, The San Jacinto-Brazos Coastal Basin and the San Bernard Coastal Basin.

As part of the Clean Rivers Program H-GAC also performs some data analysis, funds special studies and conducts public outreach activities. A major benefit of H-GAC's oversight of the coordinated monitoring program is the prevention of duplicative water quality monitoring efforts by its CRP partner agencies. This is achieved through negotiating monitoring site selection agreements between program partners and by the continuous targeting of un-represented water bodies for data collection.

Total Maximum Daily Load (TMDL)

Bacteria TMDL

Elevated bacteria levels are the overarching water quality issue in the H-GAC Gulf Coast Water Quality Management Region. As stated earlier, over seventy-five percent of the water bodies assessed in the Houston metropolitan region have bacteria levels in excess of State water quality standards and are unsafe for contact recreation. The number of area streams listed as impaired by bacteria has grown with every new assessment. Elevated bacteria levels are a health risk for persons who swim or wade in the impaired waters. Bacterial contamination also undermines a water body's value as a source of seafood and drinking water supply. In response to the elevated bacteria problem the TCEQ is conducting TMDL studies for several area waterways, encompassing most of Harris County and portions of Montgomery, Galveston, Fort Bend, Brazoria, Walker, Waller, Liberty, Grimes, and San Jacinto Counties. Twelve bacteria-impaired watersheds have been grouped into four TMDL projects: Buffalo and Whiteoak Bayous, Clear Creek, Lake Houston, and Bayous of the Houston Metro area.

Probable sources of the bacteria were identified in these TMDL's as:

- Inadequate or incomplete disinfection of discharges from wastewater treatment plants
- Wastewater collection system leaks or overflows
- Unpermitted discharges to storm sewers
- Failing on-site septic systems
- Wildlife and domestic animal wastes
- Urban storm water runoff, and
- Stream sediment re-suspension

While State wasteload models have traditionally focused on controlling pollutant contributions from permitted point sources as the primary remedy to bacteria impairment

problem, recent theories suggest that the most significant bacteria contributions may not come from wastewater treatment plants but from non-point sources. These issues are being explored by the TMDL stakeholder groups.

A thirty-member committee known as the Bacteria Implementation Group (BIG) has been charged with guiding the Houston area TMDLs through the implementation stage. The BIG is responsible for receiving input, establishing workgroups, facilitating communications, developing recommendations and providing oversight in the development of the Implementation plan (I-Plan). Fourteen workgroups were established to address specific water quality issues pertinent to the implementation plan. H-GAC staff members facilitate the activities of the BIG and its several workgroups. Other H-GAC involvement in the bacteria TMDL process include providing water quality data, GIS mapping, data analysis and programming, and public outreach and education.

Dioxin TMDL

Elevated levels of dioxins in the lower portion of the Houston Ship Channel (HSC) and Upper Galveston Bay prompted the TCEQ to place these water bodies on the 303(d) list in 1996. The Texas Department of State Health Services (TDSHS) also issued a seafood advisory for catfish and blue crabs caught in these waters because of the severe health risks associated with ingesting this very toxic substance. In 2001, the TCEQ initiated a TMDL study to pinpoint the sources of dioxin and develop an action plan to restore the water quality of these waters. The first phase focused on assessing existing data, and determining the major sources of the contaminant. This phase also involved an examination of the fate and transportation of the dioxin in the environment.

Phase two of the dioxin TMDL involved further data collection to quantify dioxin levels and to determine the sources of the contaminant. A third phase focused on developing models and load allocation. The Houston Ship Channel Dioxin and PCBs TMDL Stakeholder Group advises the TCEQ's TMDL program on its projects to reduce dioxin and PCB concentrations in the Houston Ship Channel. H-GAC facilitates this TMDL project by providing staff assistance to the process.

A TMDL becomes part of the State's Water Quality Management Plan after it is adopted by TCEQ and approved by the EPA.

Watershed Protection Planning

A watershed is the area of land that drains into a body of water such as a stream, lake, or wetland. Watersheds are a suitable planning unit for issues that relate to water quality because all the streams in the watershed are linked hydrologically. A watershed protection plan (WPP) looks to restore water quality to impaired streams and to prevent water quality problems from arising in streams that still enjoy a pristine character. These watershed protection efforts are most successful when they have the interest and active participation of local residents/stakeholders who probably know the watershed the best and who stand to benefit the most from the protection plan's success. H-GAC played a lead role in the development and implementation of protection plans for several watersheds within its planning region. These include Armand Bayou, Bastrop Bayou, Dickinson Bayou and Westfield Estates (Halls Bayou). The EPA has identified nine elements considered necessary for a successful a watershed protection plan.

1. Identification of sources and causes of pollution
2. Estimation of the necessary load reductions
3. Proposed management measures
4. Technical and financial assistance needs
5. Information, education and public participation efforts
6. Schedule for implementing management measures
7. Interim milestones for measuring progress
8. Criteria for determining pollutant load reduction
9. Water quality monitoring component

Identifying the nature and sources of pollution is necessary to determine the appropriate response to water quality problems in a watershed. Houston-Galveston Area Council and its Clean Rivers Program partners conduct continuous ambient water quality monitoring in the watersheds. The data collected identified bacteria and/or nutrients as the main concerns in the Armand Bayou, Dickinson Bayou and Westfield Estates watersheds. Bastrop Bayou though threatened still meets state water quality standards and is not listed on the 303(d) list for any water quality concerns.

In the effort to reduce pollutant levels in the waterways, a core component of the watershed protection plan is the application of the concept of Best Management Practices (BMPs). BMP's identified by H-GAC to reduce bacteria and nutrients in WPP streams include repairing malfunctioning septic systems, providing alternative water sources for cattle, educating the public on the need to pick up pet wastes, and the environmentally responsible application of fertilizers and pesticides, and providing tools to reduce impacts of storm water runoffs.

FUTURE DIRECTION

Wastewater Infrastructure Planning

The H-GAC region contains over 1,300 domestic wastewater treatment plants which handle a combined permitted discharge in excess of 1.1 billion gallons per day. These wastewater treatment facilities range in size from single user plants that discharge as little as 1,200 gallons of effluent per day to the regional municipal plant which routinely handles over 200 million gallons of effluent per day (MGD). Although there are several large regional plants, the domestic wastewater treatment landscape in the H-GAC region is dominated by small wastewater treatment facilities often referred to as "package plants." As much as sixty-six percent of the domestic wastewater plants in the region treat less than 1.0 MGD. The predominance of small domestic wastewater treatment plants sets the Houston-Galveston Region apart from other urbanized areas in Texas and the rest of the United States. For example, the four largest regional wastewater treatment plants in the Dallas-Fort Worth metroplex account for as much as 65% of the region's total permitted flow. In contrast, the four largest regional plants in the Houston metropolitan area treat only 24% of the region's permitted wastewater flow. The greater proportion of wastewater treatment in the Houston-Galveston area is handled by package plants.

The proliferation of package plants in the H-GAC region is a product of the rapid growth experienced during the 1970's and 1980's. An uncoordinated rash of "leap frog" land development was facilitated by the expanded use of utility districts and the relative ease of creating Investor Owned Utilities (IOU) by independent developers. This trend was exacerbated by the inability of the city of Houston to rapidly extend sewer service to its outlying regions. Furthermore for the developer, the cost of a private treatment plant was often less than the cost of the conveyance infrastructure needed to tie in with existing municipal sewer systems. Package plants were commonly seen as temporary wastewater treatment solutions to be replaced when permanent facilities became available. Many of these plants have reached or exceeded their design life but continue to be in service.

The strongest argument for a more coordinated solution to wastewater treatment is perhaps the fact that small wastewater treatment facilities commonly have a greater adverse impact on area streams than regional plants. A functional comparison between a regional wastewater treatment plant and a package plant is warranted. Regional plants typically serve multiple political units or a large municipal service area and may have a capacity upwards of 3.0 MGD. They are generally made of permanent construction and feature multiple process trains which ensure a high degree of treatment reliability. Regional plants enjoy savings through economies of scale realized in their construction, operation, and maintenance. They are usually better equipped than small plants, sufficiently staffed to ensure safe and adequate plant operation and are less susceptible to malfunctions. Most importantly, they present a single discharge point which regulators may readily monitor for compliance. Small domestic plants on the other hand handle an average flow of less than 1.0 MGD and are usually

designed to serve a single user or subdivision. Plants this size incur the highest unit operating costs. They are typically under-managed, lack treatment reliability and are prone to failure. Small capacity wastewater treatment plants are particularly susceptible to being overloaded during high volume rain events which frequently results in untreated wastewater entering the receiving stream directly. While their individual impacts may be limited, the cumulative pollutant load from several malfunctioning plants along a single stream could have significant environmental consequences. Considering the fact that many streams in the region are currently on the 303(d) list and are subjects of bacteria TMDL studies, it is an opportune time to explore the idea of wastewater treatment service consolidation in the Houston-Galveston area.

Figure 1 - A Regional Wastewater Treatment Plant

Fifty-seven wastewater service districts were considered in the 2009 WQMP update. There was not enough information available to complete the needs assessment of ten of these districts. The districts were selected on the basis of the date they were first permitted, giving them an average age of over 32 years. Half of the plants assessed have permitted effluent flow rates less than 1.0 MGD: one quarter of the plants are permitted at 0.5 MGD or less. The useful life of wastewater collection and treatment systems vary with design, material, construction, soil type, and maintenance. Sources suggest the useful life of package plants is 15 – 20 years, beyond which their serviceability becomes questionable. The facilities assessed in this update have reached and exceeded this crucial age limit and would potentially be good candidates for redevelopment.

In addition to their comparable age, most of the wastewater service districts assessed fall within a similar T75/T90 window. Thirty plants are projected to exceed 75% of their permitted capacity within the assessment period upon which they are required to commence the design of new or expanded facilities. Of the thirty, it is projected that nineteen plants will exceed 90% of their permitted flow within the assessment period. These plants are expected to commence construction. It is an advantage that some of these districts are in close geographical proximity as this would potentially minimize the cost of diversion infrastructure.

Lastly, most of the assessed facilities have permit renewal dates within a couple of years of each other. This will enable regulators to coordinate the phasing and implementation of service changes with the expiration of existing permits. There are, however, very few plants with excess capacity that can absorb wastewater from neighboring districts without prior expansion. A comprehensive review of wastewater treatment in the region will probably reveal more opportunities for service consolidation. Because voluntary consolidation efforts in the region have historically been unsuccessful, a wastewater treatment consolidation proposal could be coupled with ongoing TMDL projects to obtain indispensable enforcement powers.

Table 2: Wastewater Treatment Facilities in 2009 Assessment

Wastewater Districts considered	57
Facilities at 75% capacity by 2030	12
Facilities at 90% capacity by 2030	18
Facilities with capacity beyond 2030	17
Facilities with data unavailable	10

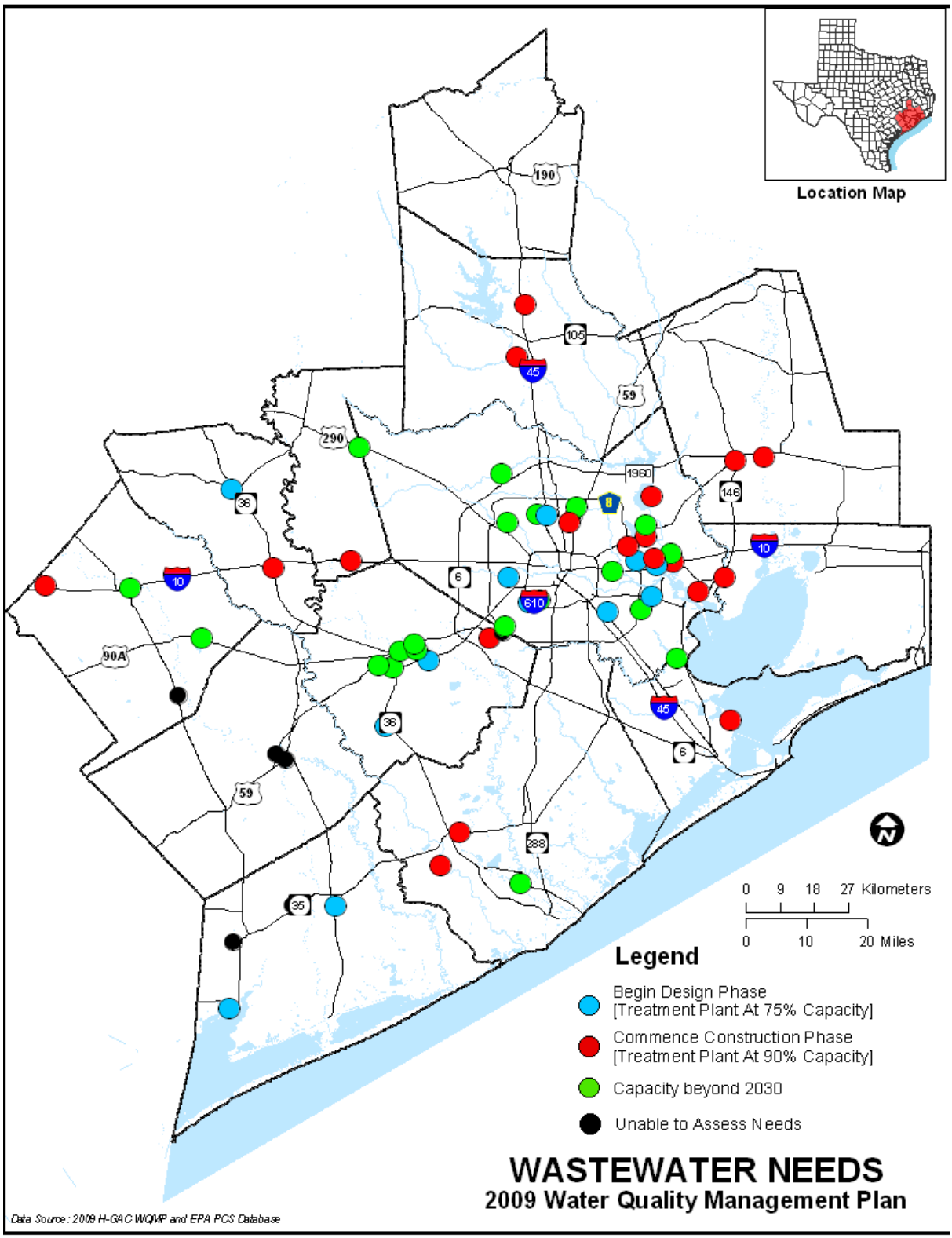

Figure 2 - Wastewater districts assessed in 2009 WQMP

On-Site Sewage Facilities

Decentralized wastewater treatment systems, also known as On-Site Sewage Facilities (OSSF), are an alternative to centralized wastewater collection and treatment systems. As the name suggests, OSSF systems treat wastewater at the location the waste is generated. The treated effluent for the most part stays on the site. OSSF systems are commonly used in rural and suburban areas where public sewer facilities are either unavailable or unfeasible. There are however enclaves within urban areas that rely on OSSF systems for their wastewater disposal. According to EPA estimates, over 26 million households in the United States depend on an on-site septic system to treat and dispose their household waste. When properly designed and maintained they could be a cost-effective and durable method of household waste disposal. OSSF systems are nevertheless prone to fail or malfunction. Common reasons cited for OSSF failure include age and design of the system, unsuitable soil, small lot size, improper installation, and the lack of proper operation or maintenance. According to the EPA, failing septic systems discharge more than one trillion gallons of raw or poorly treated sewage into subsurface and surface water annually and are the second largest threat to groundwater quality in the nation. These discharges contaminate water bodies, wells, yards and play grounds with nitrates and with water borne pathogens which can cause illnesses such as gastrointestinal infections, infectious hepatitis, cholera, and typhoid fever. More than a million people in the United States become ill each year because of exposure to raw sewage from malfunctioning septic systems. Because of the risk they pose to human health and their adverse impact on the environment, it is imperative for us to detect and correct malfunctioning septic systems.

H-GAC's Water Quality Management Program has identified OSSF system problems as a priority issue impacting water quality in the H-GAC region and has conducted several studies to address the problem. A 1999 study assessed twenty-six "Target Communities" known to have malfunctioning or inadequate septic systems. These communities included unplatted settlements, unincorporated subdivisions and small towns. The study took into consideration location, lot sizes, housing density, property values, and population characteristics in defining recommendations for each individual community. The proposed solution was to provide municipal wastewater service to these communities. This proposal unfortunately proved to be cost prohibitive at the time and was not widely implemented.

In 2005 H-GAC initiated a more comprehensive study to:

- collect information on the magnitude of the OSSF problem,
- develop a task force to propose solutions,
- prepare a regional template for action using several communities in a pilot program, and
- prepare an action plan for wastewater treatment solutions and implement the findings.

As part of the first phase of the study, staff obtained records of OSSF permits issued between 2001 and 2005 in the most urbanized counties of the H-GAC region. They also obtained records of complaints of septic system violations for the same time period. The street addresses of reported violations were converted into a digital map using Geographical

Information Systems (GIS) technology. Clusters of complaints on the map revealed the location of communities that could be candidates for a failing OSSF system assessment. This three-year study was cut short after the first year due to budgetary constraints. The expectation was that the information collected from this study would be utilized in the next phase, when funding became available.

The Failing Septic System Initiative (FSSI) was initiated in 2007 to assess bacterial contamination in a "high interest" community in Harris County Precinct 2 – Westfield Estates. The four objectives of this study were to:

- quantify bacterial contamination in the Westfield Estates community and the nearby Halls Bayou,
- identify the source of contamination,
- develop correction strategies to address the problem, and
- raise awareness of the problem of failing septic systems and to assist in developing specific initiatives to correct the problem.

The study found that many residential lots that were originally sized for OSSF systems had been subdivided and could no longer support on-site wastewater treatment. Furthermore, the community had a low tax base and could not support capital improvements needed to bring in municipal sewer services. The study proposed the formation of a stakeholder group or partnership that would among other things investigate funding sources, develop and oversee implementation measures and conduct a sustained outreach and education program within the community, to create a community wide awareness of the septic system problem. As a short term measure, it advocated the implementation of best management practices (BMPs) including the regular maintenance and repair of existing OSSF systems, timely removal of wastes from storage tanks, improved drainage and flood control measures, and the implementation of a more efficient and timely system to enforce permit regulations.

These and other similar studies have established that failing septic systems are a pervasive problem in the H-GAC region. The stage is set to formulate and implement a region-wide plan of action with cost-effective solutions that will reduce the impact of septic systems on the area's water resources.

Planning Information Summary

Overview. The Houston-Galveston Area Council (H-GAC) compiles the wastewater facility information in this report to assist the Water Quality and Technical Analysis Division of the TCEQ. Additionally, domestic wastewater facility financing decisions made by the Texas Water Development Board (TWDB) under the State Revolving Loan Fund (SRF) program must be consistent with the certified and approved Water Quality Management Plan (WQMP) developed by H-GAC for its region and by the TCEQ for the entire state.

Facility needs of the wastewater treatment permit holders assessed in this document were last updated by H-GAC and certified in the 1999 Water Quality Management Plan Update, with population data based on the 1990 census. Current projections use the 2000 census data.

The purpose of this document is to present data reflecting facility planning needs, including previous water quality management plan needs that require revision. Data is also presented to update other plan information for the TWDB's SRF projects. Only domestic municipal facilities are presented in this report.

Forecast Methodology. Several types of information are required to prepare population and needs projections. These include Service Area Boundaries (SAB), current population data, current constituent flow data, and regional population forecasts. H-GAC obtained the required information for this report from several sources including legal representatives or engineers of the permit holders and the TCEQ (service area boundaries), the Environmental Protection Agency (actual effluent flow), and H-GAC's Forecast Modeling Group (population estimates and projections). This information was used to determine:

- Future service area population in yearly increments;
- Future flow through the wastewater treatment plant;
- Need to begin design of new/expanded facilities (75% of the permitted flow); and
- Need to begin construction of facilities (90% of permitted flow).

The source of the population forecast data is H-GAC's Regional Growth Forecast which was formulated in 2005. The forecast model divided the entire region into about a quarter million grid cells consisting of square blocks of about 1000 feet to a side. The forecast model predicts the number of people who will be residing in every grid cell in a given forecast year. The cells that fall within each wastewater district's service area are then selected. To determine the projected population numbers for a wastewater service district, the grid cell population values are aggregated for the relevant forecast years. The aggregated population values for each wastewater service district permits the needs determination. The forecast model gives planners a reasonable prediction for future population and wastewater treatment needs in different parts of the region.

Population and Needs Forecasts. Table 3 contains the updated information for population and wastewater treatment plant needs in the selected service areas. The table is organized in alphabetical order and includes the following 10 categories of information:

1. *Planning Area* - Area for which facility needs are proposed. The facility planning areas are subject to change during the facility planning process and any such changes will be documented in later water quality management plan updates.

2. *Service Area* - Area that receives the provided wastewater service as defined by and obtained directly from the facility's engineer.

3. *Needs* - A "T" indicates a need for either initial construction of a wastewater treatment plant, additional treatment capacity, or the upgrading of a wastewater treatment plant to meet existing or more stringent effluent requirements. A "T/75" indicates the treatment plant exceeds 75% of the plant's designed capacity and should commence design. A "T/90" indicates the facility exceeds 90% of its design flow capacity on an annual basis and construction of new or upgraded facilities must commence.

4. *Needs Year* - The year the needs will occur in the planning area.

5. *Designated Planning Area or Basin Name* - The Houston-Galveston Area Council's 13-county planning region is one of the governor's seven designated water quality management-planning areas.

6. *Segment* - The classified stream segment into which any recommended facility may discharge existing or projected wastewater. In the case of no-discharge facilities, this is a classified stream segment drainage area in which the facilities are located.

7. *County* - the County in which the facility planning area is located.

8. *Date* - The last date facility was reviewed.

9. *Comments* - Additional explanation or other information concerning the facility planning area.

10. *Population* - The base year and projected population for each facility planning area. Population projections presented represent the most current information obtained from H-GAC forecasts and the facility planning analyses as projected from the H-GAC 2005 population forecast.

The facility planning information in this section is intended to be utilized in the preparation of facility plans and subsequent design and construction of wastewater treatment facilities. Design capacities of the treatment and collection systems will be based upon the population

projections contained in this document and any additional needed capacity established for commercial/industrial flows and documented infiltration/inflow volumes (treatment or rehabilitation). The probable needs shown under the "Needs" heading are preliminary findings. Specific needs for an area shall be established in the completed and certified detailed engineering studies conducted during facilities planning under the SRF and other state loan programs.

GULF COAST REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE: 2009

Appendix I
Population and Wastewater Treatment Plant Needs through 2030

TABLE 3: Population and Wastewater Treatment Plant Needs through 2030

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Bay City, City of		T/75	2025	H-GAC	2441	Matagorda	8/31/99		2005	19283
									2008	19670
									2010	19921
									2015	20585
									2020	21293
									2025	21650
									2030	22126
Baytown, City of	Central Plant	T/75 T/90	2008 2015	H-GAC	2426	Harris	8/31/99		2005	39538
									2008	42222
									2010	43592
									2015	45093
									2020	47477
									2025	49791
									2030	53371
Baytown, City of	East Plant	T/75 T/90	2008 2015	H-GAC	901	Harris	8/31/99		2005	32130
									2008	34819
									2010	36370
									2015	41979
									2020	45369
									2025	51464
									2030	57903
Baytown, City of	West Plant	T/75 T/90	2020 2025	H-GAC	1001	Harris	8/31/99		2005	20025
									2008	23651
									2010	25670
									2015	30542
									2020	37333
									2025	46743
									2030	56150
Bellaire, City of		None		H-GAC	1007	Harris	8/31/99		2005	23362
									2008	23494
									2010	23483
									2015	23362
									2020	23463
									2025	23046
									2030	23074

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Bellville, City of		T/75	2008	H-GAC	1202	Austin	8/31/99		2005	4045
									2008	4114
									2010	4191
									2015	4410
									2020	4567
									2025	4720
									2030	4830
Brookshire MUD		T/75 T/90	2015 2025	H-GAC	1202	Waller	8/31/99		2005	2962
									2008	3272
									2010	3449
									2015	3779
									2020	4252
									2025	4633
									2030	5453
Colorado County WCID 2		Unable to determine needs	n/a	H-GAC	1402	Colorado	8/31/99	Population Unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a
Columbus, City of		None		H-GAC	1402	Colorado	8/31/99		2005	3990
									2008	4026
									2010	4053
									2015	4155
									2020	4231
									2025	4280
									2030	4331
Conroe, City of		T/75 T/90	2010 2015	H-GAC	1004	Montgomery	8/31/99		2005	49088
									2008	55987
									2010	61488
									2015	69567
									2020	81756
									2025	100798
									2030	109655

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Dayton, City of		T/75 T/90	2008 2015	H-GAC	801	Liberty	8/31/99		2005	5915
									2008	6436
									2010	6677
									2015	7204
									2020	7717
									2025	8369
									2030	8827
Deer Park, City of		T/75	2030	H-GAC	1006	Harris	8/31/99		2005	29625
									2008	30810
									2010	31090
									2015	31651
									2020	32338
									2025	33425
									2030	35477
Eagle Lake, city of		None		H-GAC	1402	Colorado	8/31/99		2005	3730
									2008	3766
									2010	3792
									2015	3870
									2020	3959
									2025	4005
									2030	4052
Fort Bend County WCID 2		T/75 T/90	2008 2010	H-GAC	1245	Fort Bend	8/31/99		2005	26047
									2008	22092
									2010	28161
									2015	28604
									2020	29666
									2025	32440
									2030	34448
Fort Bend County WCID 2		Unable to determine needs		H-GAC	1007	Fort Bend	8/31/99	Flow not available from PCS Website	2005	21310
									2008	22092
									2010	22564
									2015	23012
									2020	24088
									2025	26680
									2030	28422

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Harris County FWSD 51		T/75	2008	H-GAC	1006	Harris	8/31/04		2005	23090
									2008	23665
									2010	23554
									2015	23624
									2020	23316
									2025	23035
									2030	23407
Harris County FWSD 52		None		H-GAC	1009	Harris	8/31/04		2005	6593
									2008	6760
									2010	6768
									2015	6682
									2020	6689
									2025	6803
									2030	7146
Harris County WCID 1		None		H-GAC	1001	Harris	8/31/99		2005	7595
									2008	8331
									2010	8790
									2015	10903
									2020	11604
									2025	12199
									2030	12900
Harris County WCID 21		T/75	2030	H-GAC	1006	Harris	8/31/99		2005	12182
									2008	13571
									2010	13933
									2015	15219
									2020	15796
									2025	16180
									2030	16991
Harris County WCID 50		None		H-GAC	2425	Harris	8/31/99		2005	5997
									2008	6170
									2010	6249
									2015	6513
									2020	6677
									2025	6741
									2030	6776

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Harris County WCID 70		T/75 T/90	2008 2010	H-GAC	1001	Harris	8/31/99		2005	1288
									2008	1722
									2010	2131
									2015	2253
									2020	4368
									2025	6397
									2030	7097
Harris County WCID 84		T/75 T/90	2010 2020	H-GAC	1006	Harris	8/31/99		2005	4187
									2008	4267
									2010	4684
									2015	5026
									2020	6371
									2025	8108
									2030	8843
Harris County WCID – Fondren Road		None		H-GAC	1007	Harris	8/31/99		2005	4333
									2008	4309
									2010	4362
									2015	4273
									2020	4417
									2025	4370
									2030	4309
Jacinto City, City of		None		H-GAC	1007	Harris	8/31/99		2005	11914
									2008	12154
									2010	12272
									2015	12470
									2020	12468
									2025	12648
									2030	13346
Lake Jackson, City of		None		H-GAC	1201	Brazoria	8/31/04		2005	27906
									2008	29788
									2010	30473
									2015	30747
									2020	30926
									2025	31928
									2030	32894

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Liberty, City of		T/75 T/90	2010 2030	H-GAC	801	Liberty	8/31/99		2005	8773
									2008	9794
									2010	10525
									2015	11288
									2020	12136
									2025	12506
									2030	12992
Markham MUD		Unable to determine needs		H-GAC	1502	Matagorda	8/31/99	Population Unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a
Matagorda County WCID 5		Unable to determine needs		H-GAC	2452	Matagorda	8/31/99	Population Unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a
Memorial Village Water Authority		T/75	2025	H-GAC	1014	Harris	8/31/99		2005	14719
									2008	14923
									2010	14893
									2015	14835
									2020	15050
									2025	15112
									2030	15047
Needville, City of		T/75	2025	H-GAC	1302	Fort Bend	8/31/99		2005	3740
									2008	3838
									2010	3839
									2015	4000
									2020	4050
									2025	4326
									2030	4936

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Palacios, City of		T/75	2020	H-GAC	2452	Matagorda	8/31/99		2005	5315
									2008	5430
									2010	5499
									2015	5675
									2020	5878
									2025	5980
									2030	6108
Pasadena, City of		None		H-GAC	1006	Harris	8/31/98		2005	172060
									2008	177672
									2010	180875
									2015	191333
									2020	201714
									2025	211106
									2030	221506
Richmond, City of	Second Street	Unable to determine needs		H-GAC	1202	Fort Bend	8/31/98	Service Area Unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a
Richmond, City of	Regional Plant	None		H-GAC	1202	Fort Bend	8/31/98		2005	14551
									2008	16817
									2010	17638
									2015	18925
									2020	21059
									2025	23645
									2030	25037
Richmond, City of		Unable to determine needs		H-GAC	1202	Fort Bend	8/31/98	Service Area Unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Rosenberg, City of	Plant 1	None		H-GAC	1202	Fort Bend	8/31/98		2005	17756
									2008	18654
									2010	18796
									2015	19130
									2020	19540
									2025	20757
									2030	21042
Rosenberg, City of	Plant 2	None		H-GAC	1202	Fort Bend	8/31/98		2005	25615
									2008	33956
									2010	36246
									2015	39288
									2020	47683
									2025	53771
									2030	57927
Rosenberg, City of	Plant 3	None		H-GAC	1202	Fort Bend	8/31/98		2005	41
									2008	62
									2010	62
									2015	53
									2020	54
									2025	55
									2030	55
Royalwood MUD		T/75 T/90	2025 2025	H-GAC	1006	Harris	8/31/98		2005	1334
									2008	1378
									2010	1393
									2015	1507
									2020	1560
									2025	2240
									2030	2622
Sealy, City of		T/75	2025	H-GAC	1202	Austin	8/31/98		2005	5577
									2008	5787
									2010	5922
									2015	6260
									2020	6582
									2025	6790
									2030	7008

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Sheldon Rd MUD	Sheldon Woods	T/75 T/90	2008 2010	H-GAC	1001	Harris	8/31/98		2005	737
									2008	1205
									2010	1654
									2015	1867
									2020	2650
									2025	3607
									2030	4517
Sheldon Rd MUD	Rolling Hills	None		H-GAC	1001	Harris	8/31/98		2005	1344
									2008	1347
									2010	1361
									2015	1450
									2020	1712
									2025	1788
									2030	1995
South Houston, City of		T/75 T/90	2008 2015	H-GAC	1101	Galveston	8/31/98		2005	21275
									2008	21563
									1010	21736
									2015	22534
									2020	23263
									2025	23816
									2030	25149
Sunbelt FWSD	Oakwilde	T/75 T/90	2008 2020	H-GAC	1006	Harris	8/31/98		2005	9111
									2008	9173
									2010	9176
									2015	9340
									2020	9597
									2025	9631
									2030	9764
Sunbelt FWSD	Northline	T/75	2020	H-GAC	1006	Harris	8/31/98		2005	3454
									2008	3605
									2010	3704
									2015	3846
									2020	3816
									2025	4200
									2030	4182

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Sunbelt FWSD	High Meadows	Unable to determine needs		H-GAC	1006	Harris	8/31/98	Flow not available from PCS Website	2005	2332
									2008	2455
									2010	2860
									2015	2915
									2020	2966
									2025	3146
									2030	3210
Sunbelt FWSD	Heather Glen	None		H-GAC	1006	Harris	8/31/98		2005	4542
									2008	4482
									2010	4439
									2015	4281
									2020	4163
									2025	4498
									2030	4500
Sunbelt FWSD	Woodland Oaks	None		H-GAC	1017	Harris	8/31/98		2005	4730
									2008	4732
									2010	4720
									2015	4791
									2020	4697
									2025	4969
									2030	4946
Sunbelt FWSD	Fairgreen	T/75	2008	H-GAC	1016	Harris	8/31/98		2005	10575
									2008	10609
									2010	10909
									2015	11215
									2020	11185
									2025	11264
									2030	11342
Sweeny, City of		T/75 T/90	2008 2008	H-GAC	1301	Brazoria	8/31/98		2005	4022
									2008	4230
									2010	4389
									2015	4482
									2020	4556
									2025	4647
									2030	4748

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Texas City, City of		T/75 T/90	2020 2030	H-GAC	2431	Galveston	8/31/98		2005	42791
									2008	43905
									2010	45089
									2015	50993
									2020	56353
									2025	60778
									2030	64389
Waller, City of		None		H-GAC	1009	Waller/Harris	8/31/99		2005	2498
									2008	2596
									2010	2710
									2015	2909
									2020	3060
									2025	3513
									2030	3558
Weimar, City of		T/75 T/90	2008 2020	H-GAC	1402	Harris/Galveston	8/31/99		2005	2017
									2008	2036
									2010	2050
									2015	2095
									2020	2140
									2025	2165
									2030	2190
West Columbia, City of		T/75 T/90	2008 2008	H-GAC	1202	Brazoria	8/31/99		2005	5052
									2008	5457
									2010	5497
									2015	5587
									2020	5673
									2025	5745
									2030	5953
West University Place, City of		None		H-GAC	1007	Harris	8/31/99		2005	22028
									2008	22130
									2010	22139
									2015	22843
									2020	22745
									2025	22235
									2030	22184

Planning Agency	Service Area	Needs	Needs Year	Planning Area	Segment	County	Last WQMP Update	Comments	Year	Population
Wharton, City of (Plant 1)		Unable to determine needs		H-GAC	1402	Wharton	8/31/99	Population forecast unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a
Wharton, City of (Plant 2)		Unable to determine needs		H-GAC	1402	Wharton	8/31/99	District Boundary Unavailable	2005	n/a
									2008	n/a
									2010	n/a
									2015	n/a
									2020	n/a
									2025	n/a
									2030	n/a
Willis, City of		T/75 T/90	2010 2015	H-GAC	1004	Montgomery	8/31/98		2005	4495
									2008	5316
									2010	5638
									2015	6524
									2020	8129
									2025	11353
									2030	12080

GULF COAST REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE: 2009

Appendix II

Service Area Boundary Maps

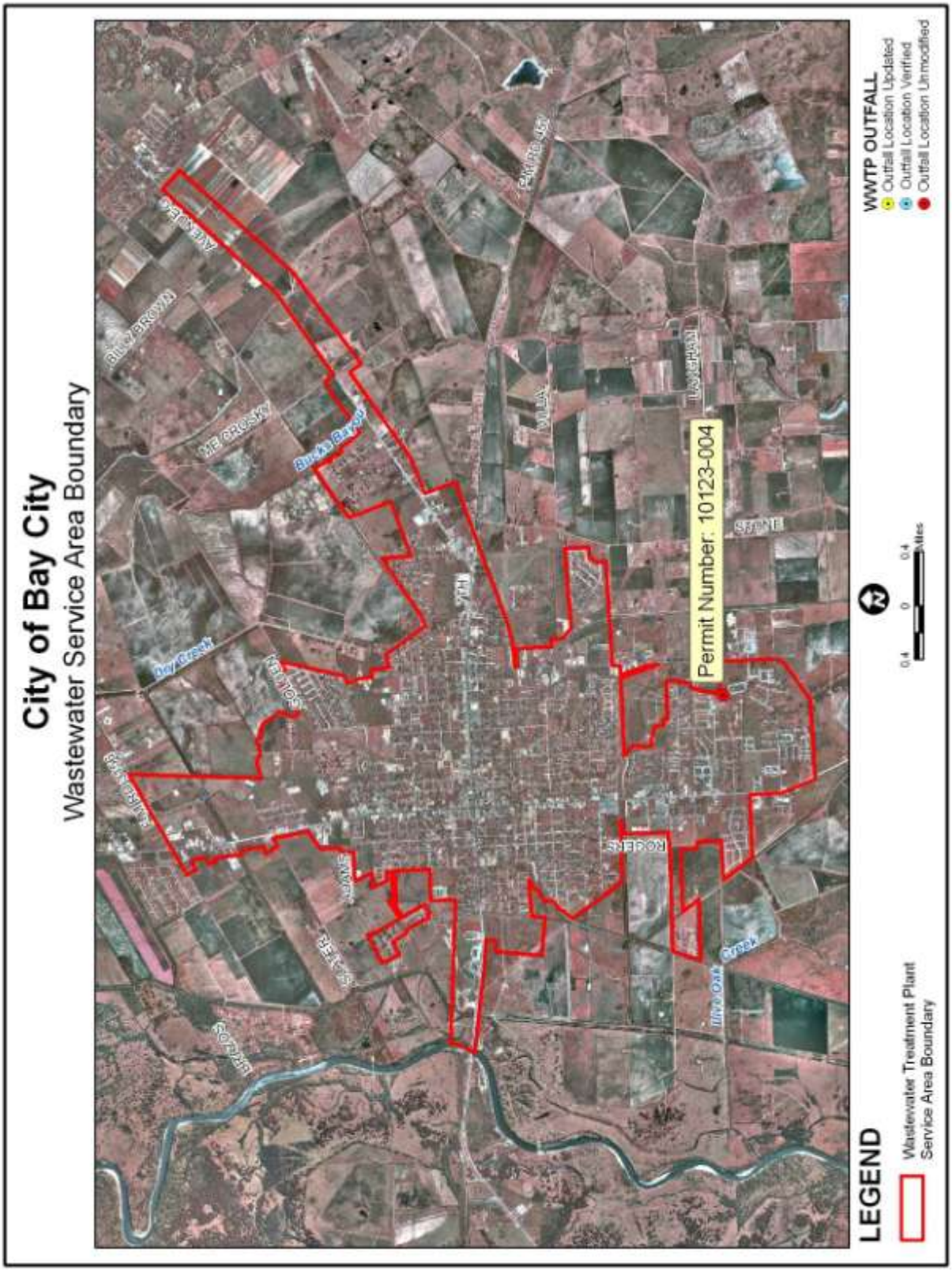

Figure 3 - City of Bay City

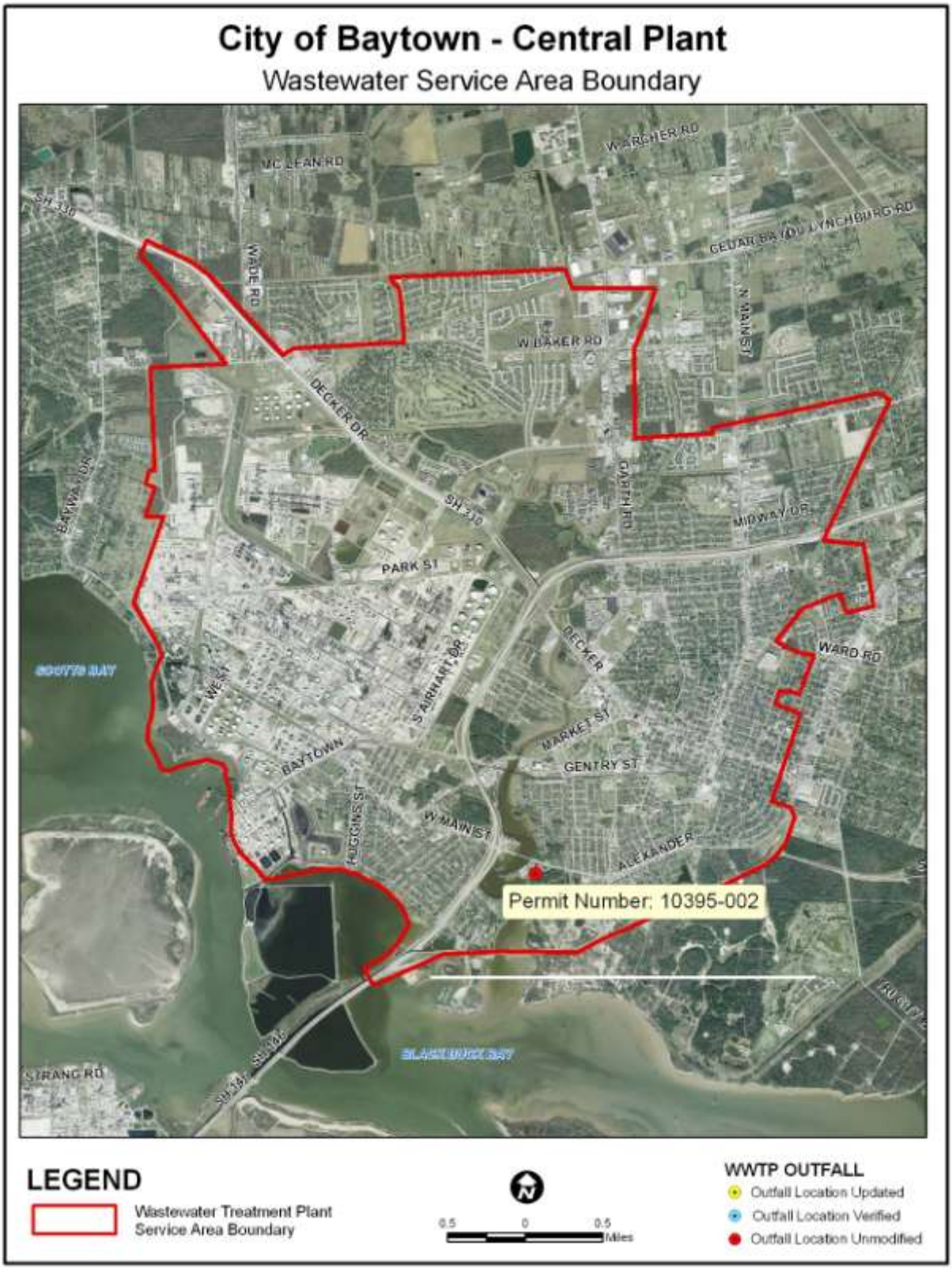

Figure 4 - City of Baytown [Central Plant]

Figure 5 - City of Baytown [East Plant]

Figure 6 - City of Baytown [West Plant]

Figure 7 - City of Bellaire

Figure 8 - City of Bellville

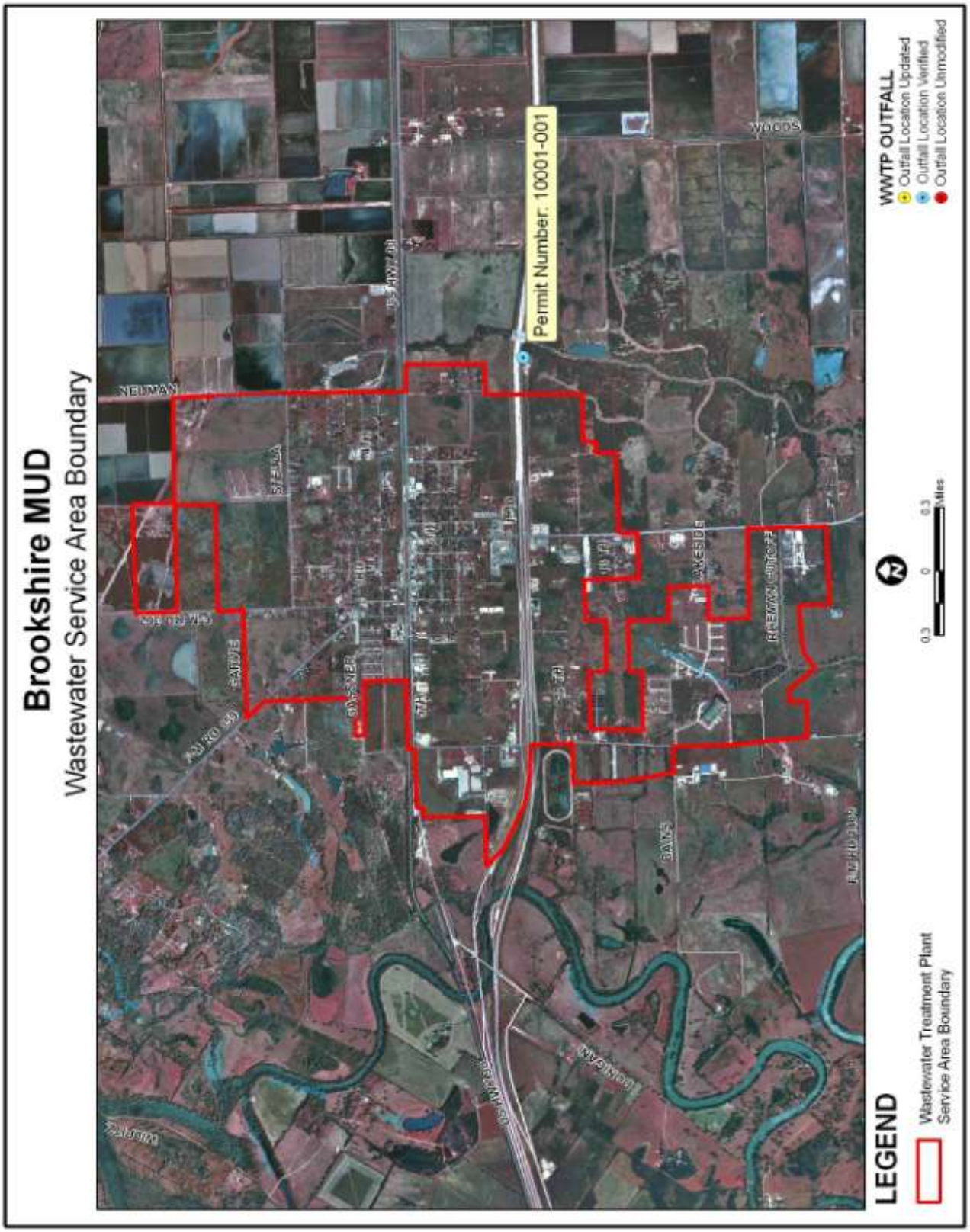

Figure 9 – Brookshire MUD

Figure 10 – Colorado County WCID 2

Figure 11 – City of Columbus

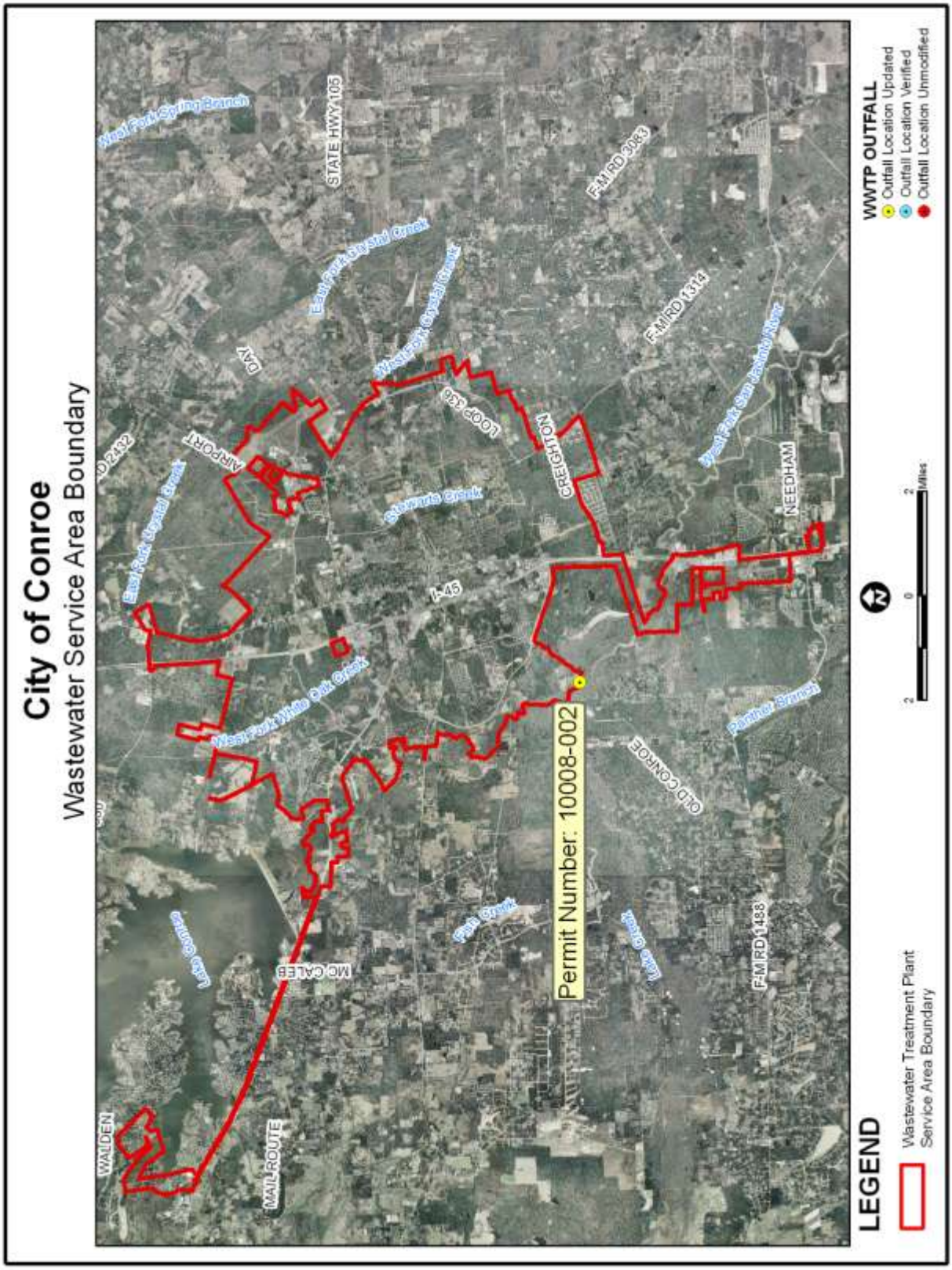

Figure 12 – City of Conroe

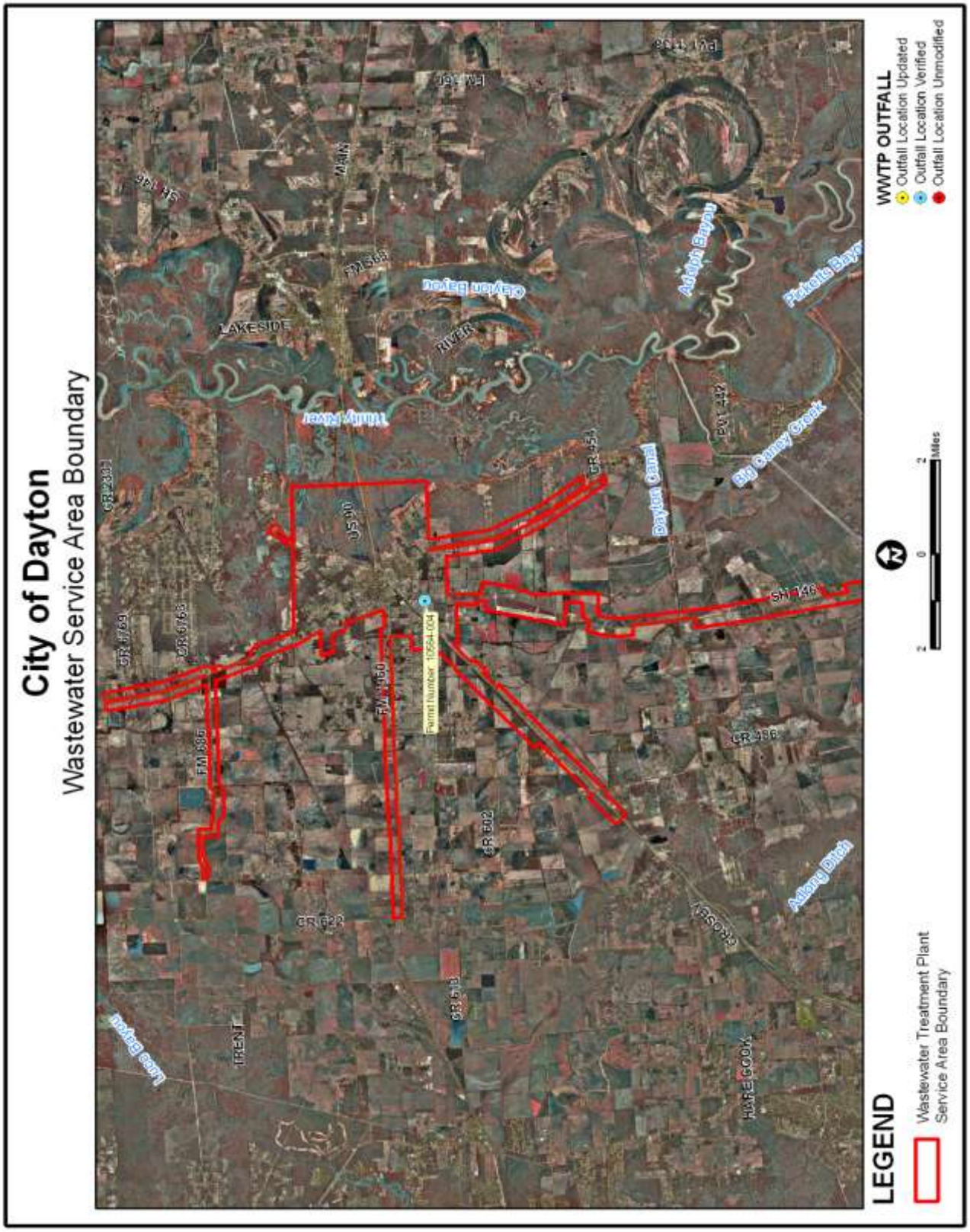

Figure 13 – City of Dayton

Figure 14 – City of Deer Park

Figure 15 – City of Eagle Lake

Figure 16 – Fort Bend WCID2

Figure 17 – Harris County FWSD 51

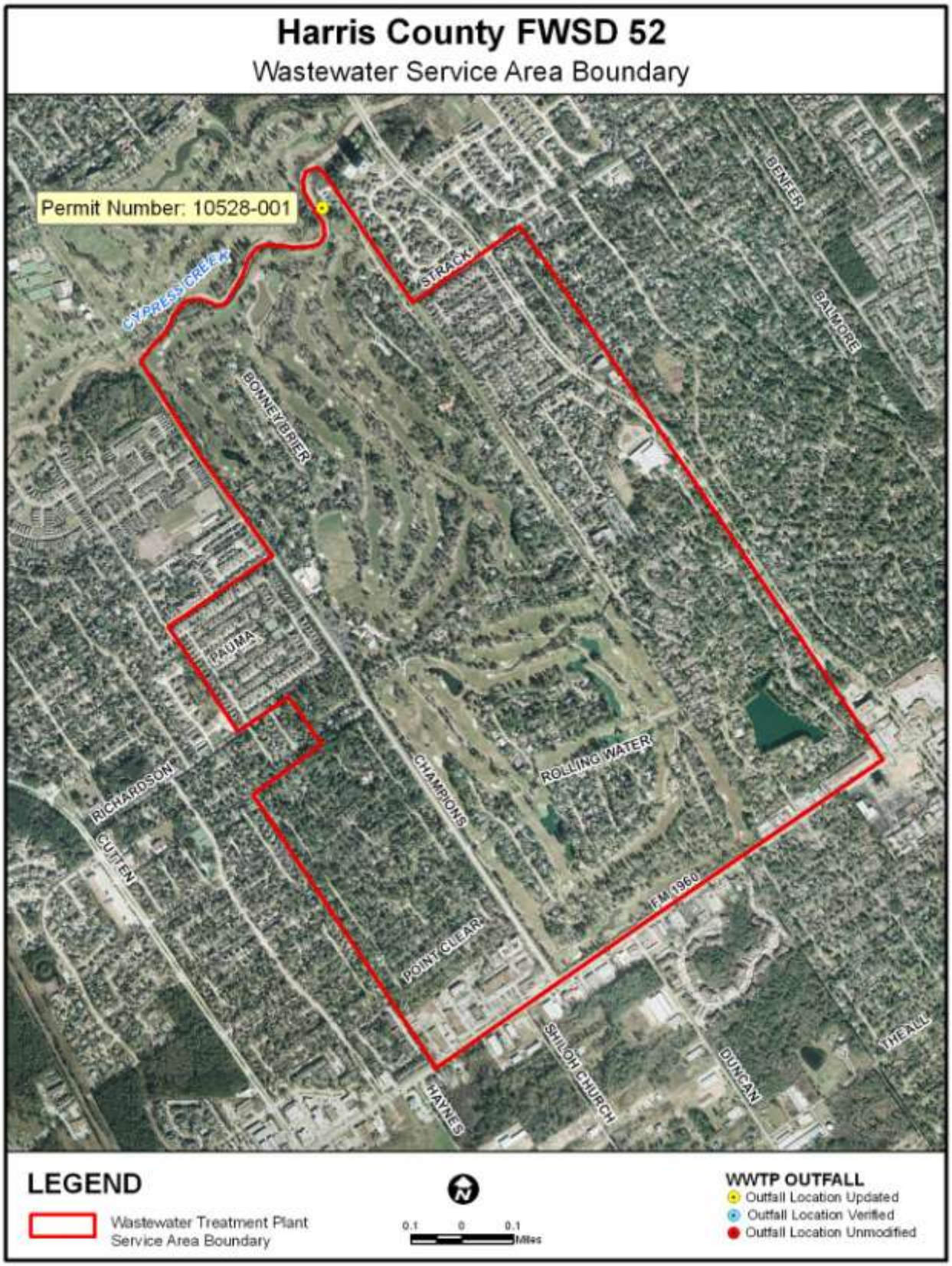

Figure 18 – Harris County FWSD 52

Figure 19 – Harris County WCID 1

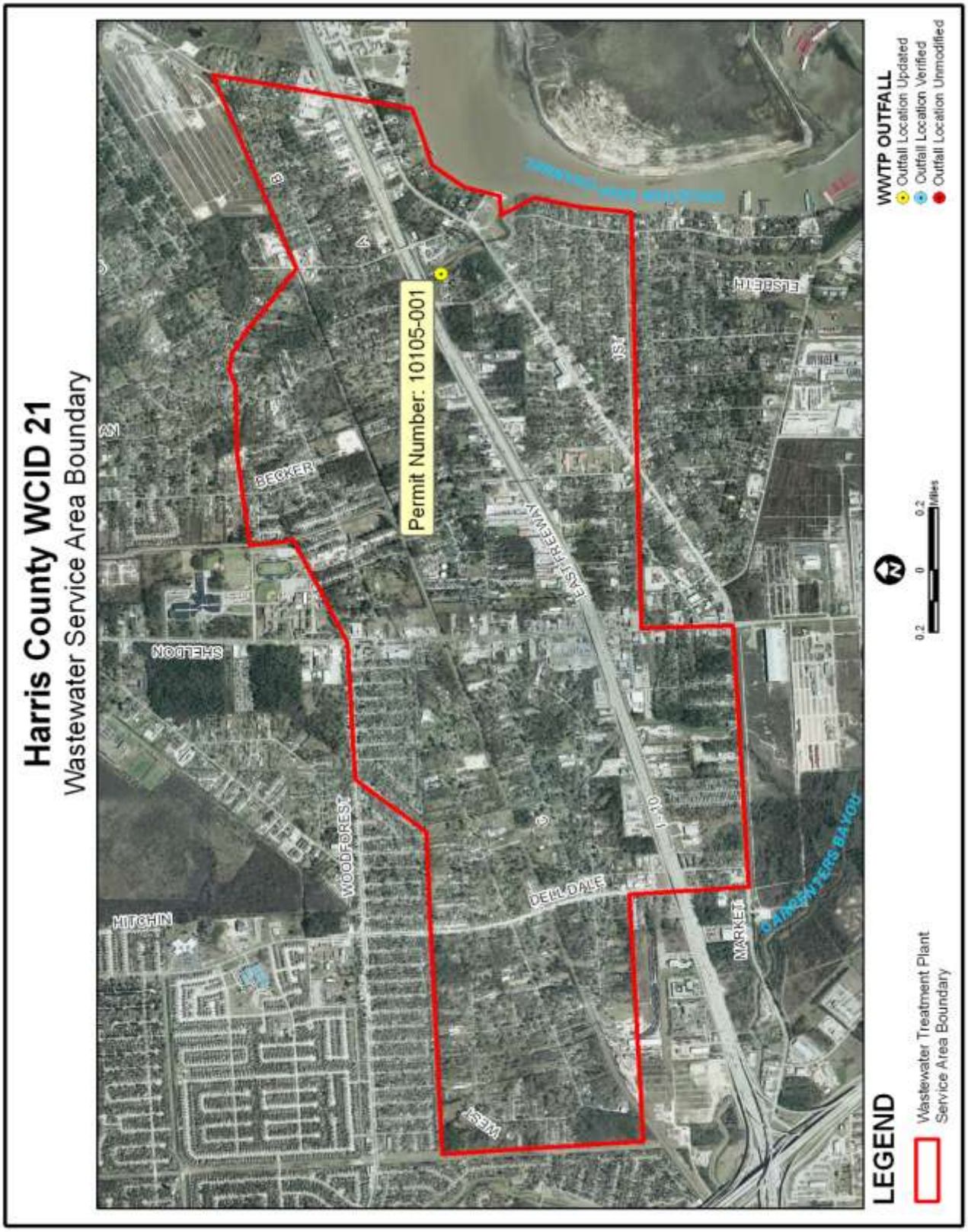

Figure 20 – Harris County WCID 21

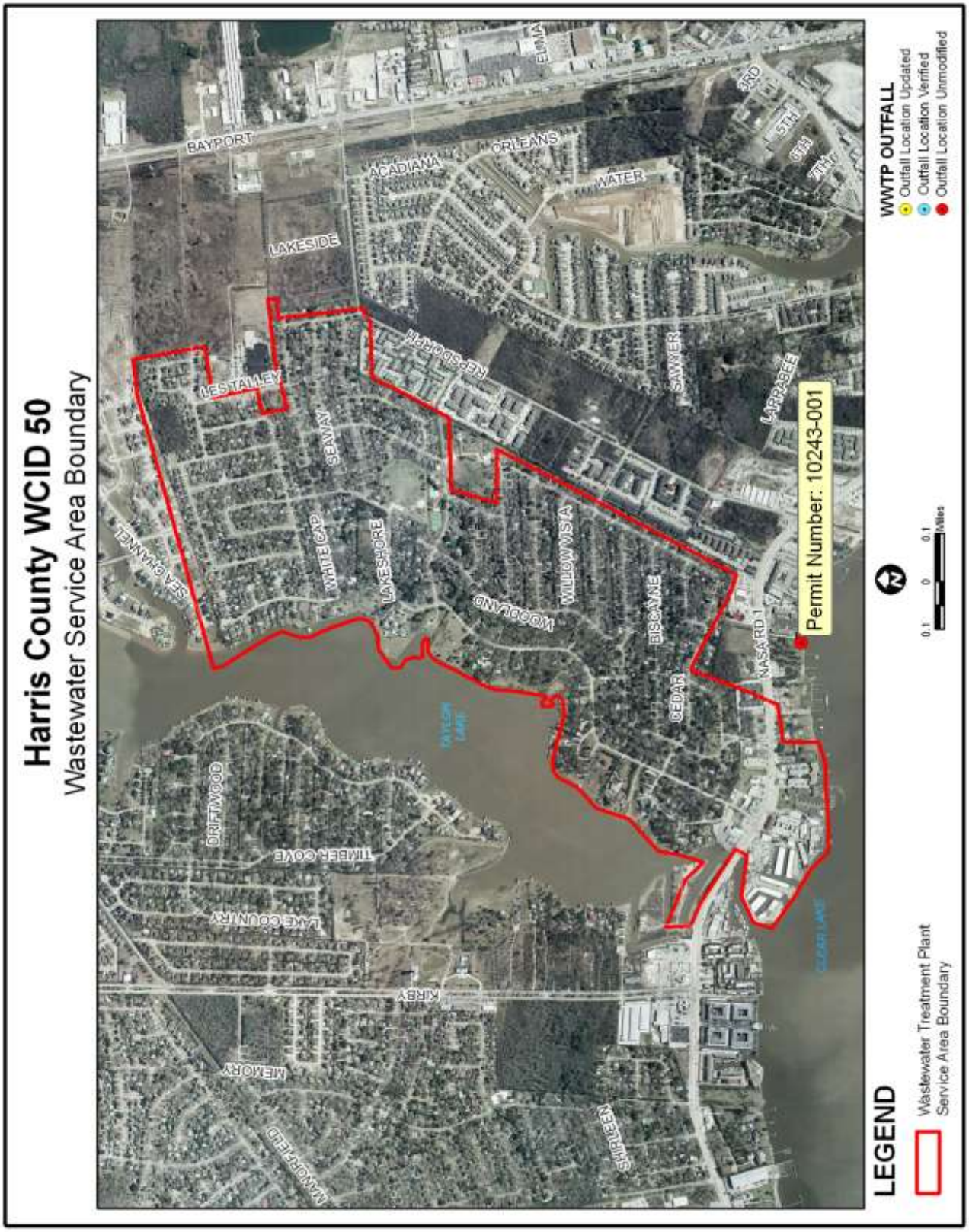

Figure 21 – Harris County WCID 50

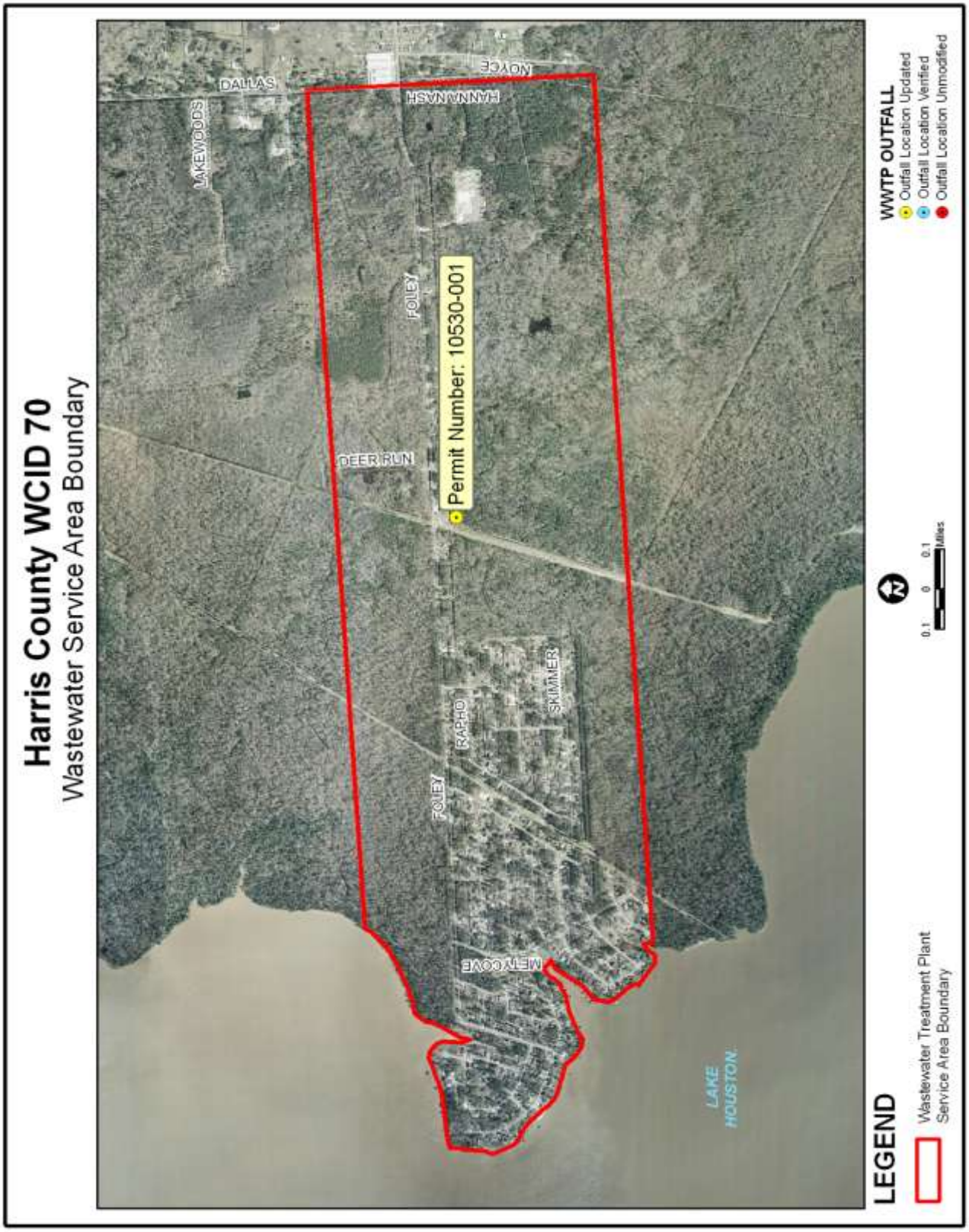

Figure 22 – Harris County WCID 70

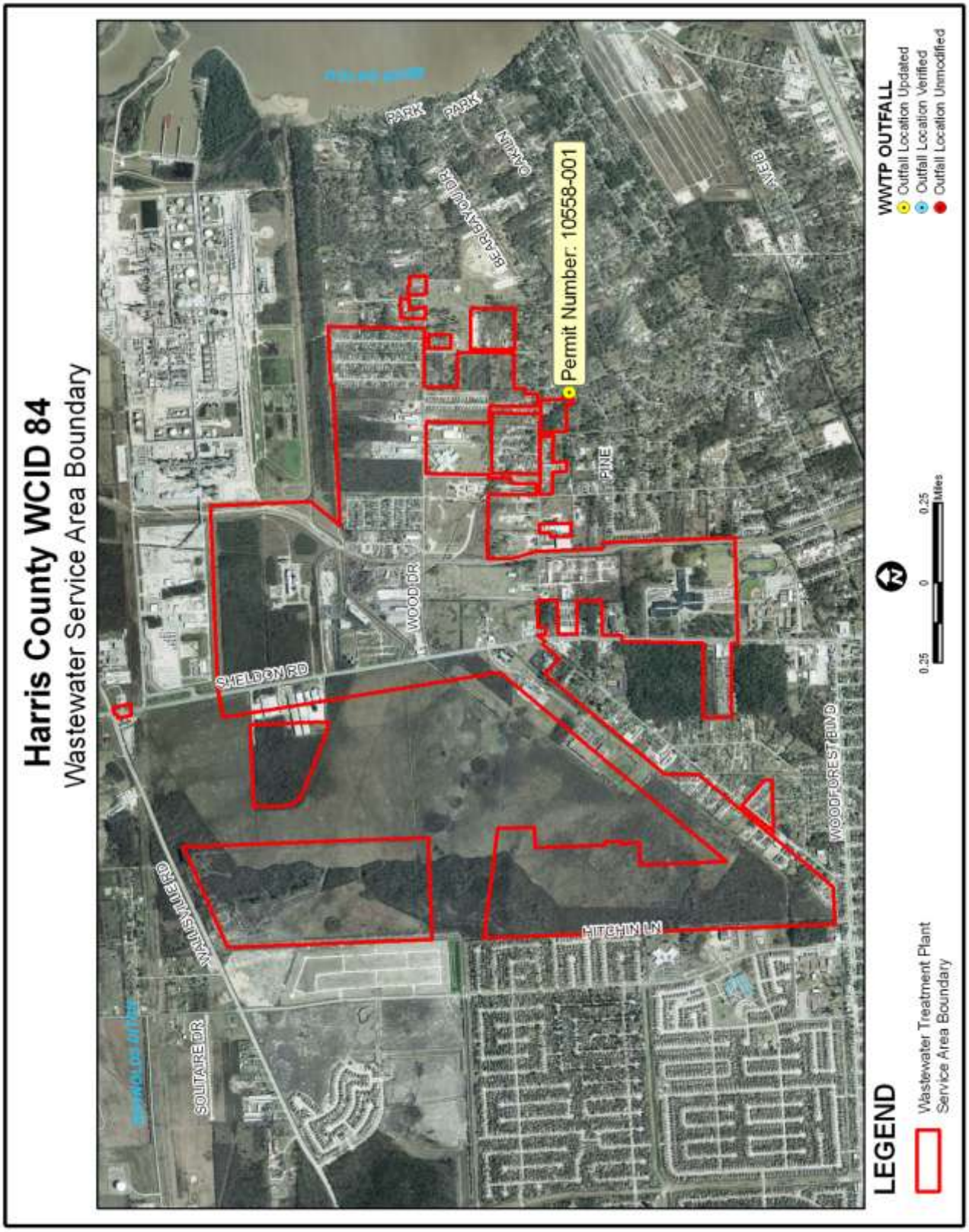

Figure 23 – Harris County WCID 84

Figure 24 – Harris County WCID [Fondren Road]

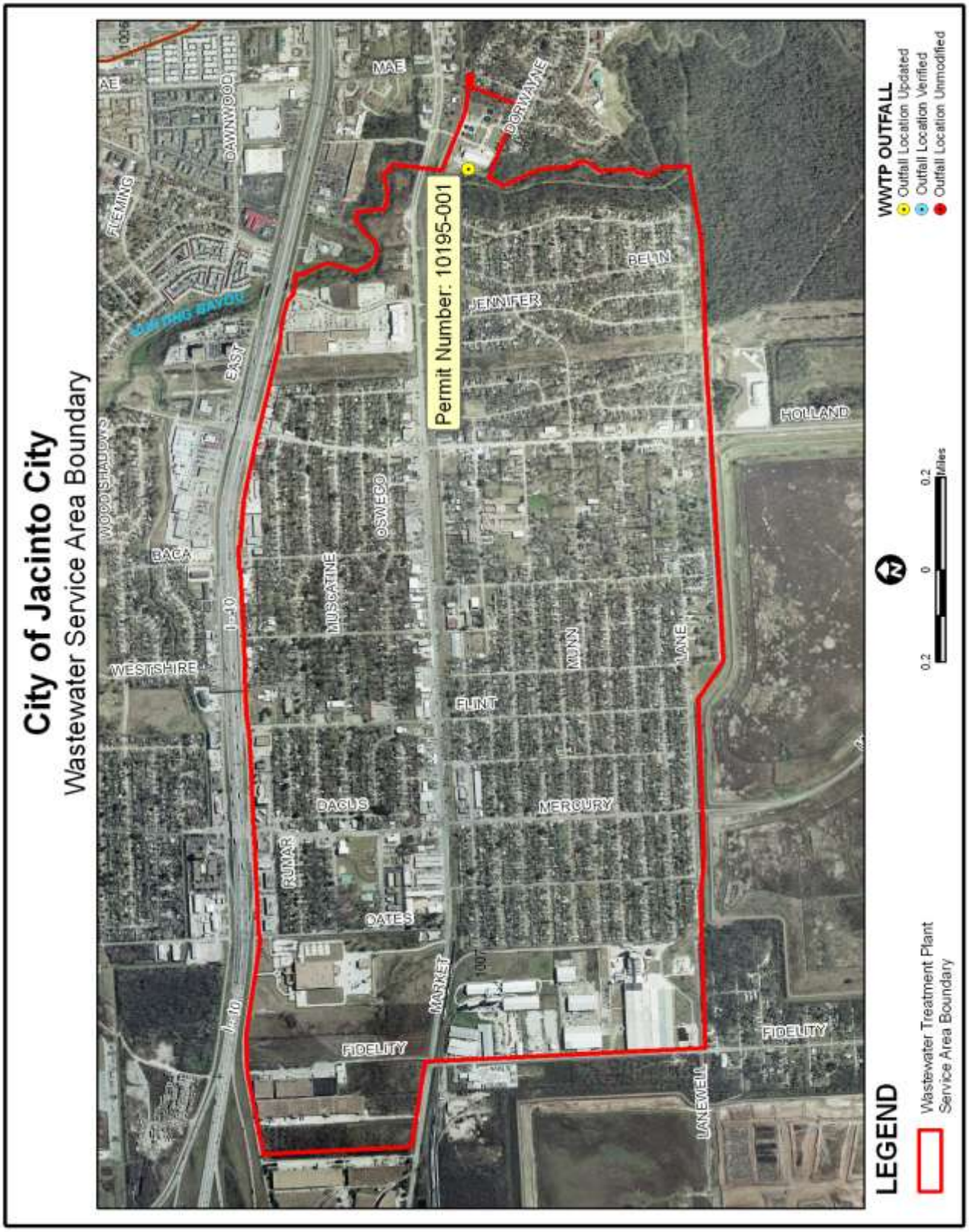

Figure 25 – City of Jacinto City

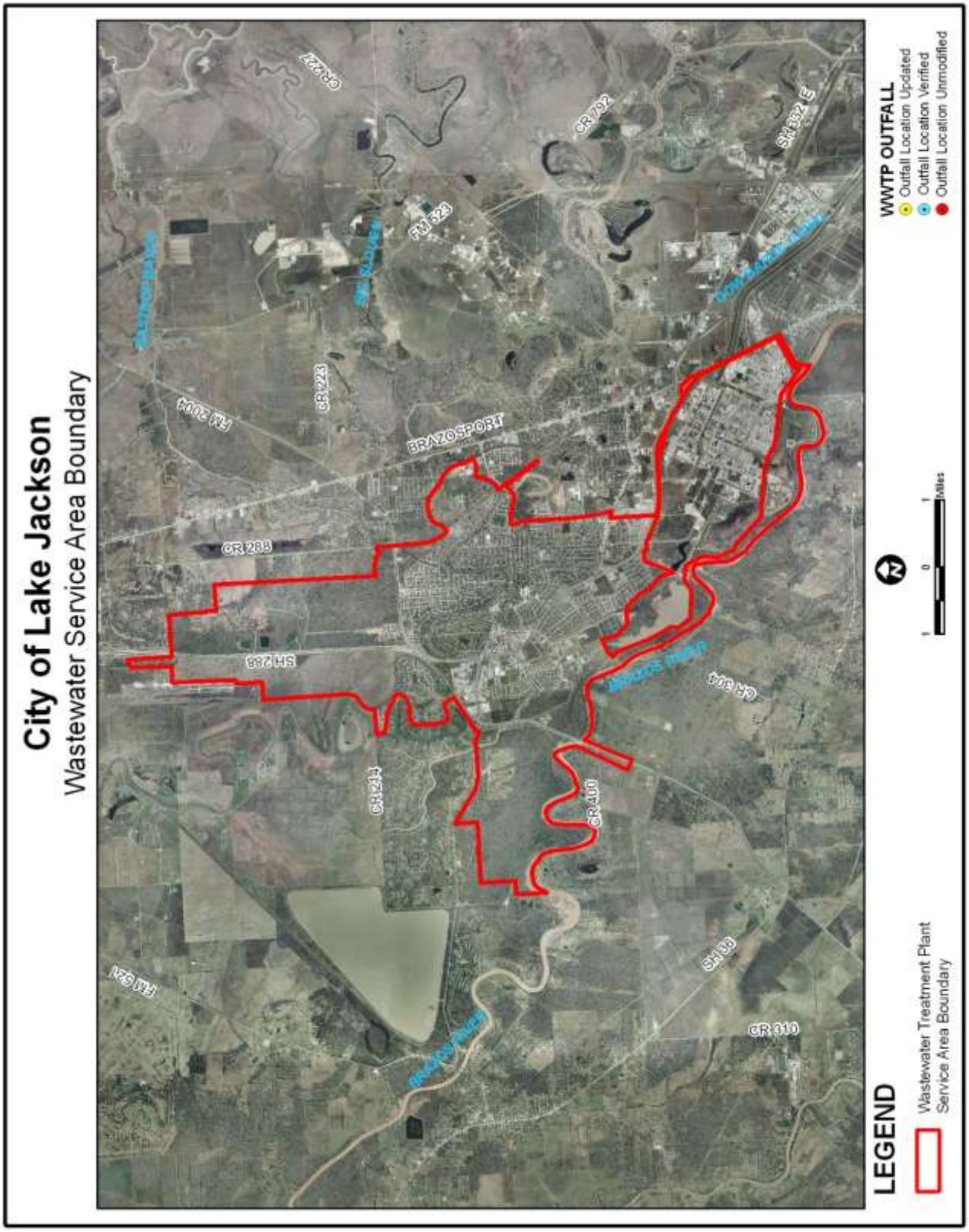

Figure 26 – City of Lake Jackson

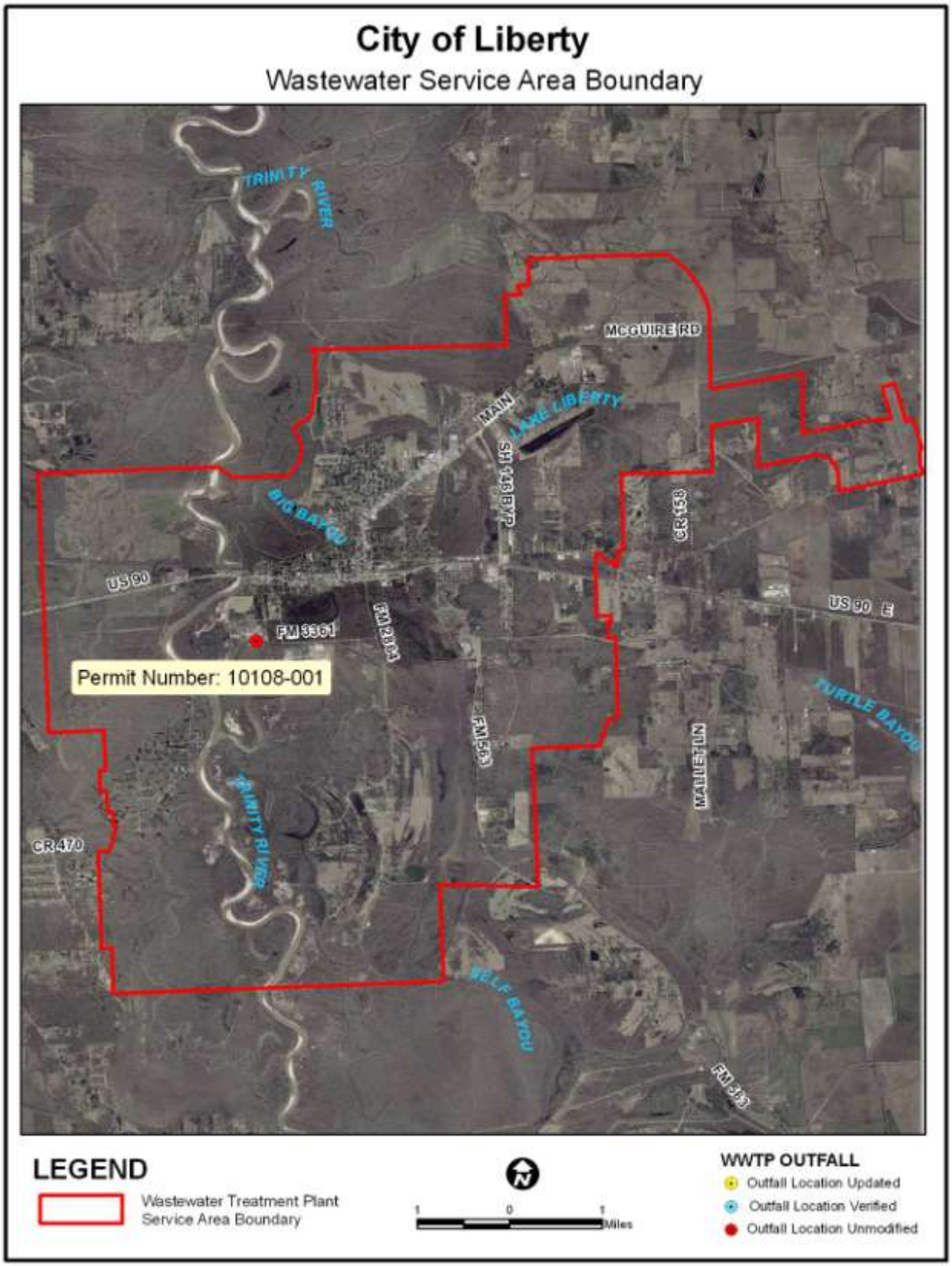

Figure 27 – City of Liberty

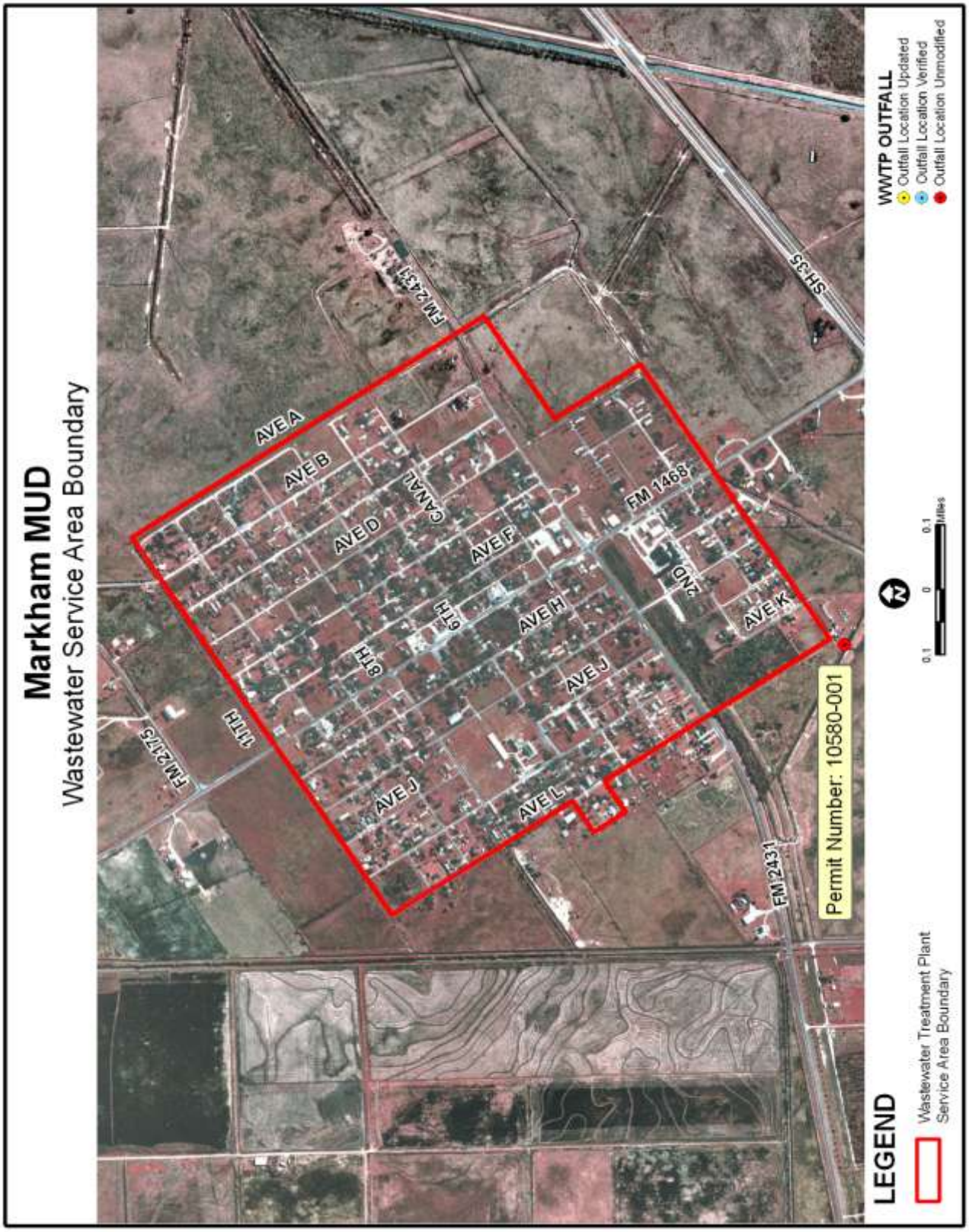

Figure 28 – Markham MUD

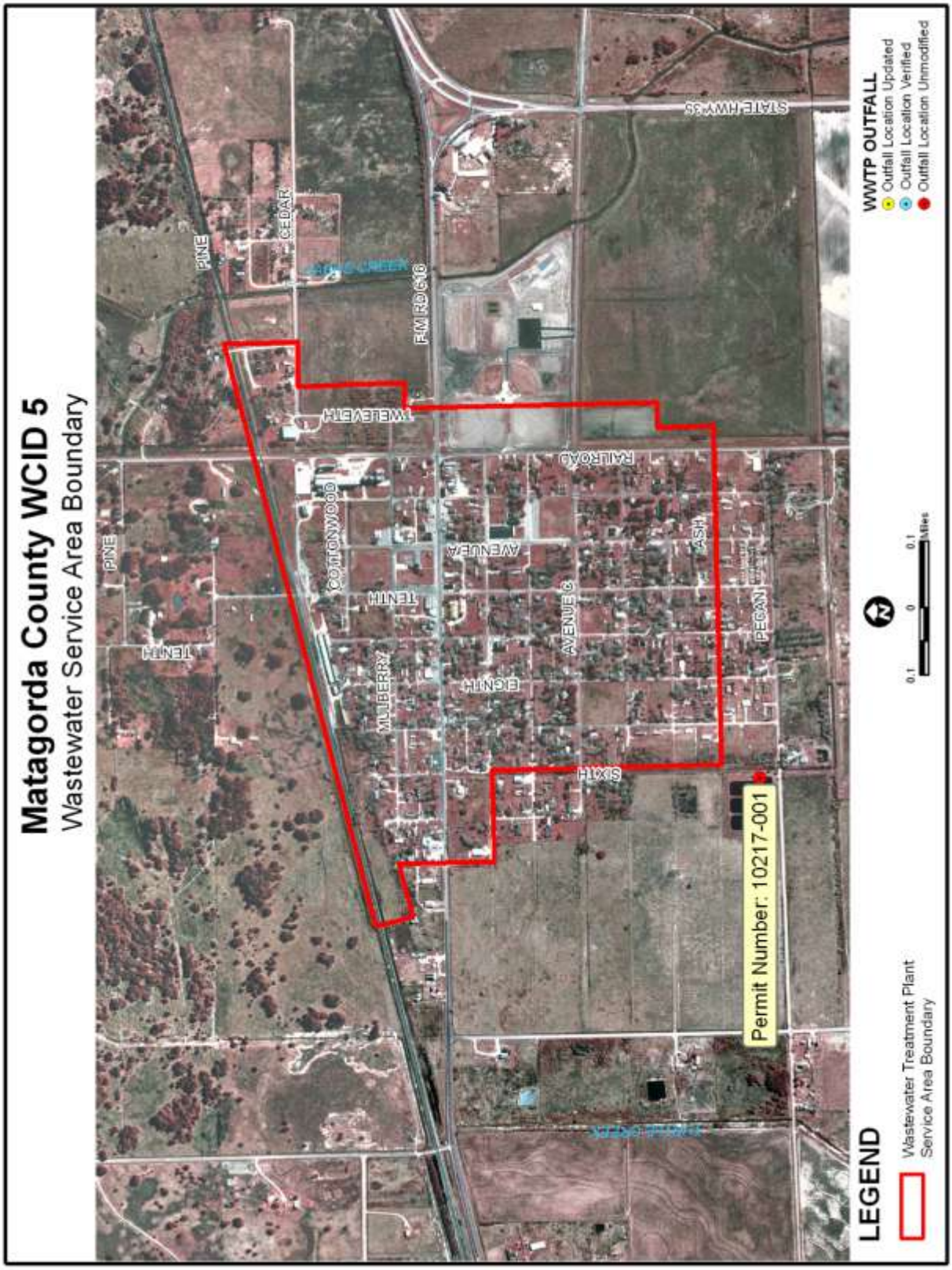

Figure 29 – Matagorda County WCID 5

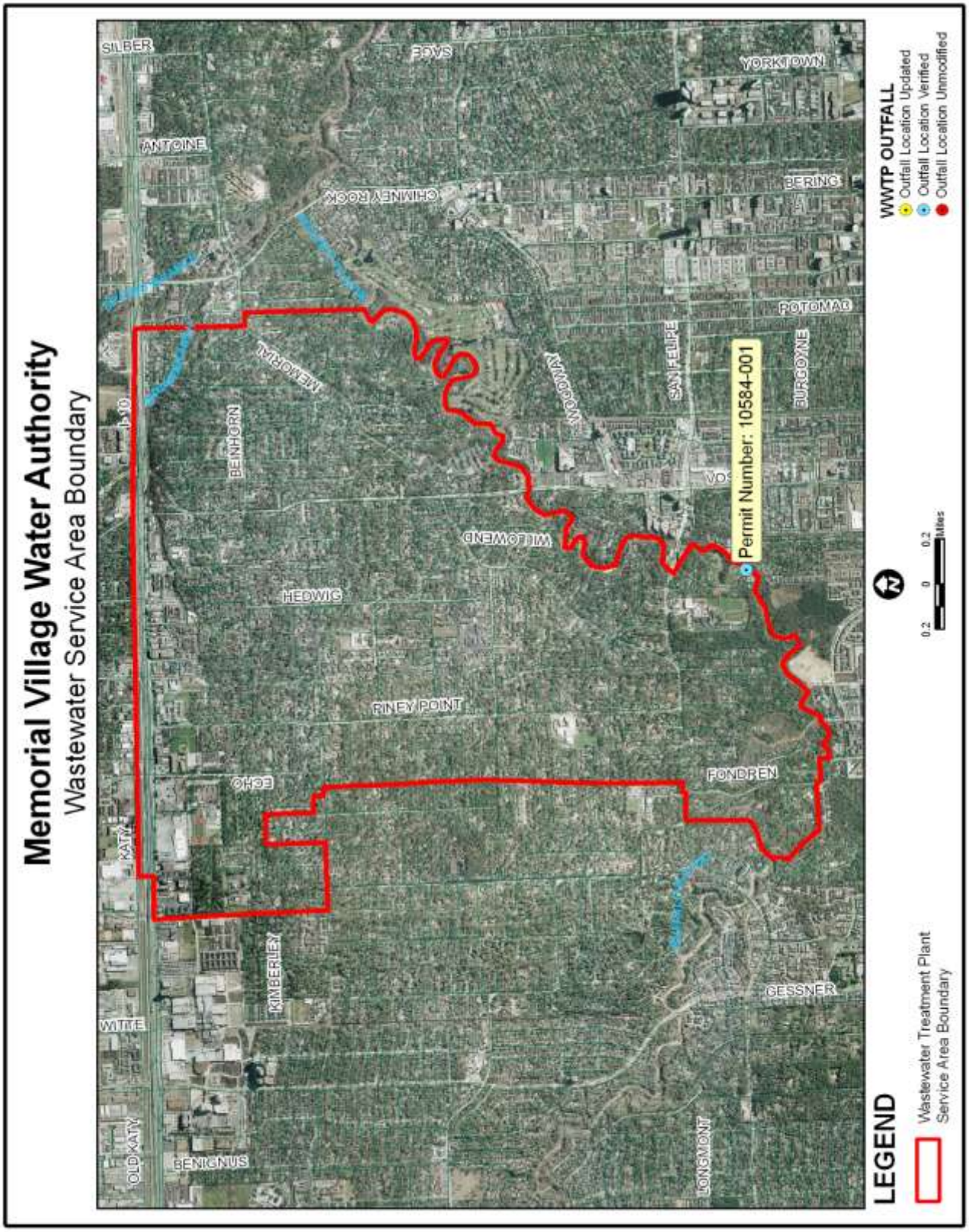

Figure 30 – Memorial Village Water Authority

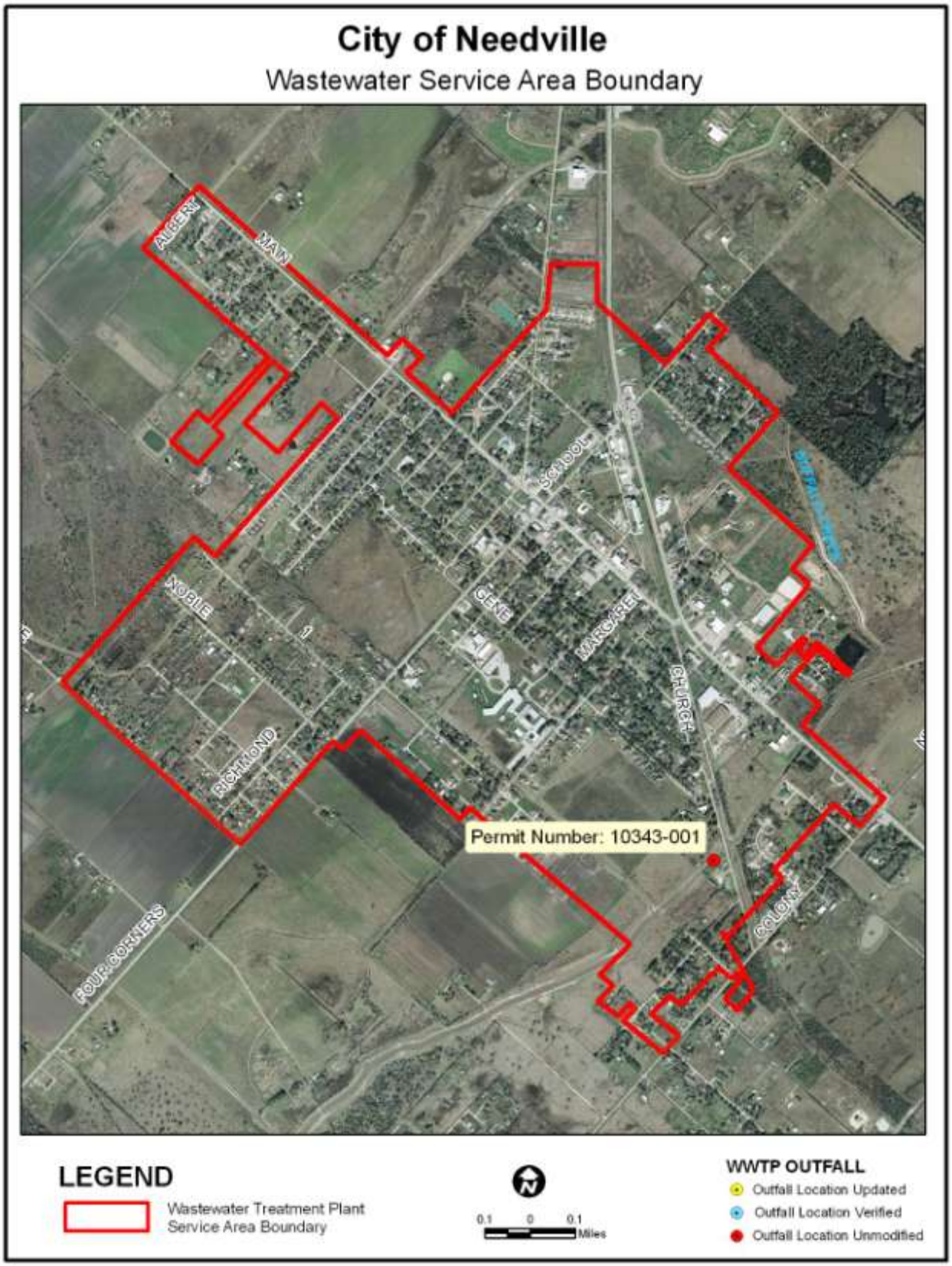

Figure 31 – City of Needville

Figure 32 – City of Palacios

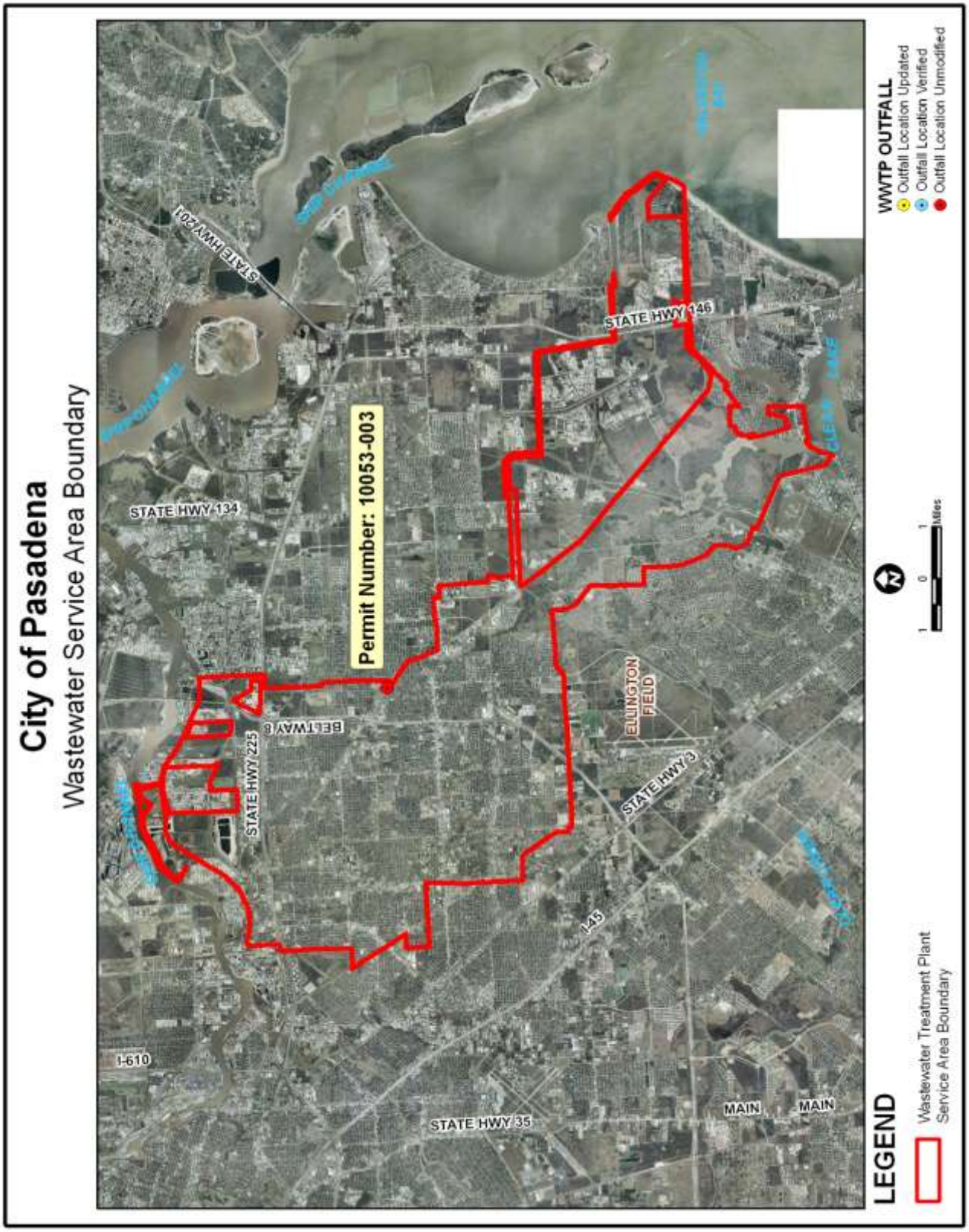

Figure 33 – City of Pasadena

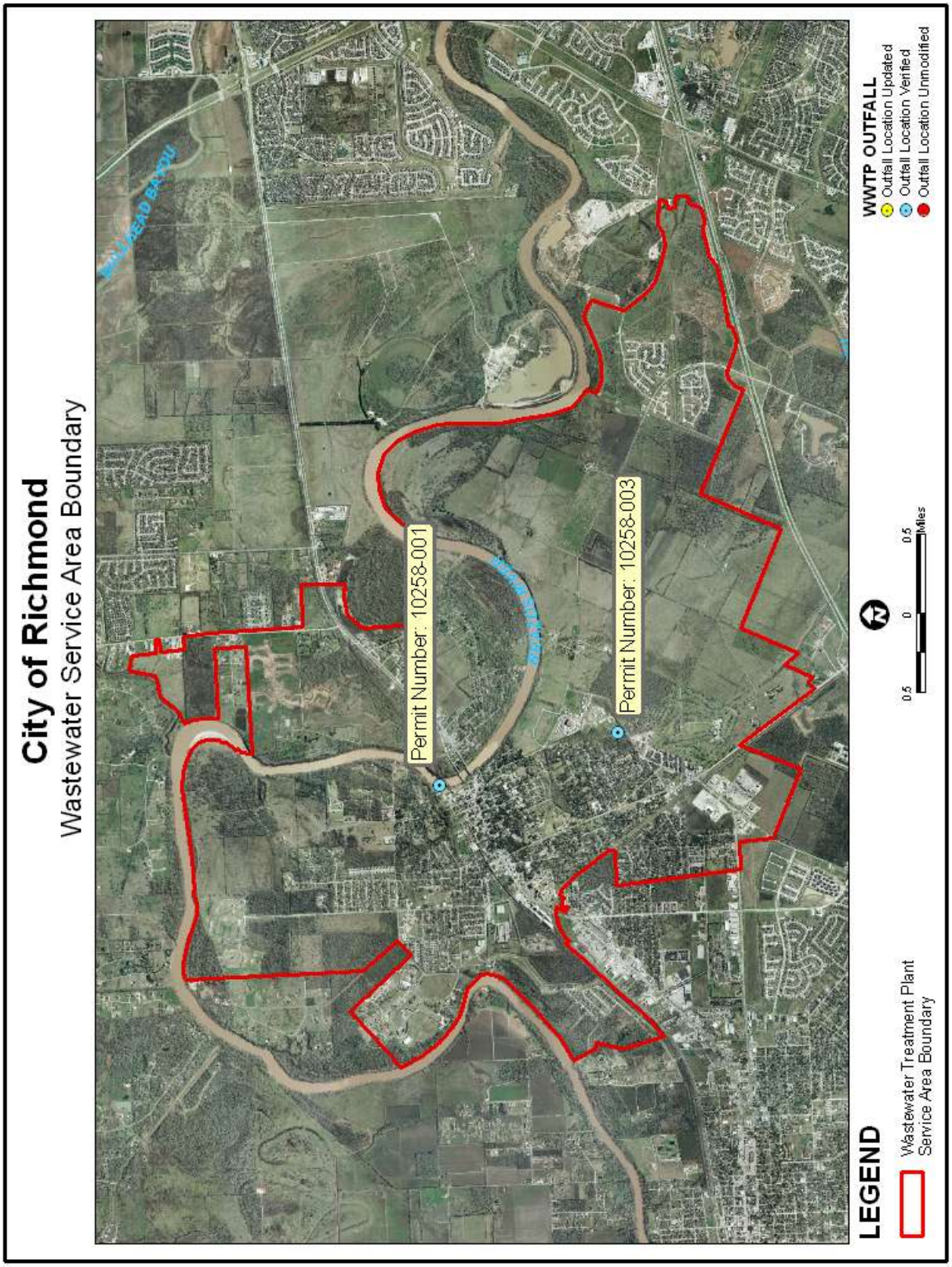

Figure 34 – City of Richmond

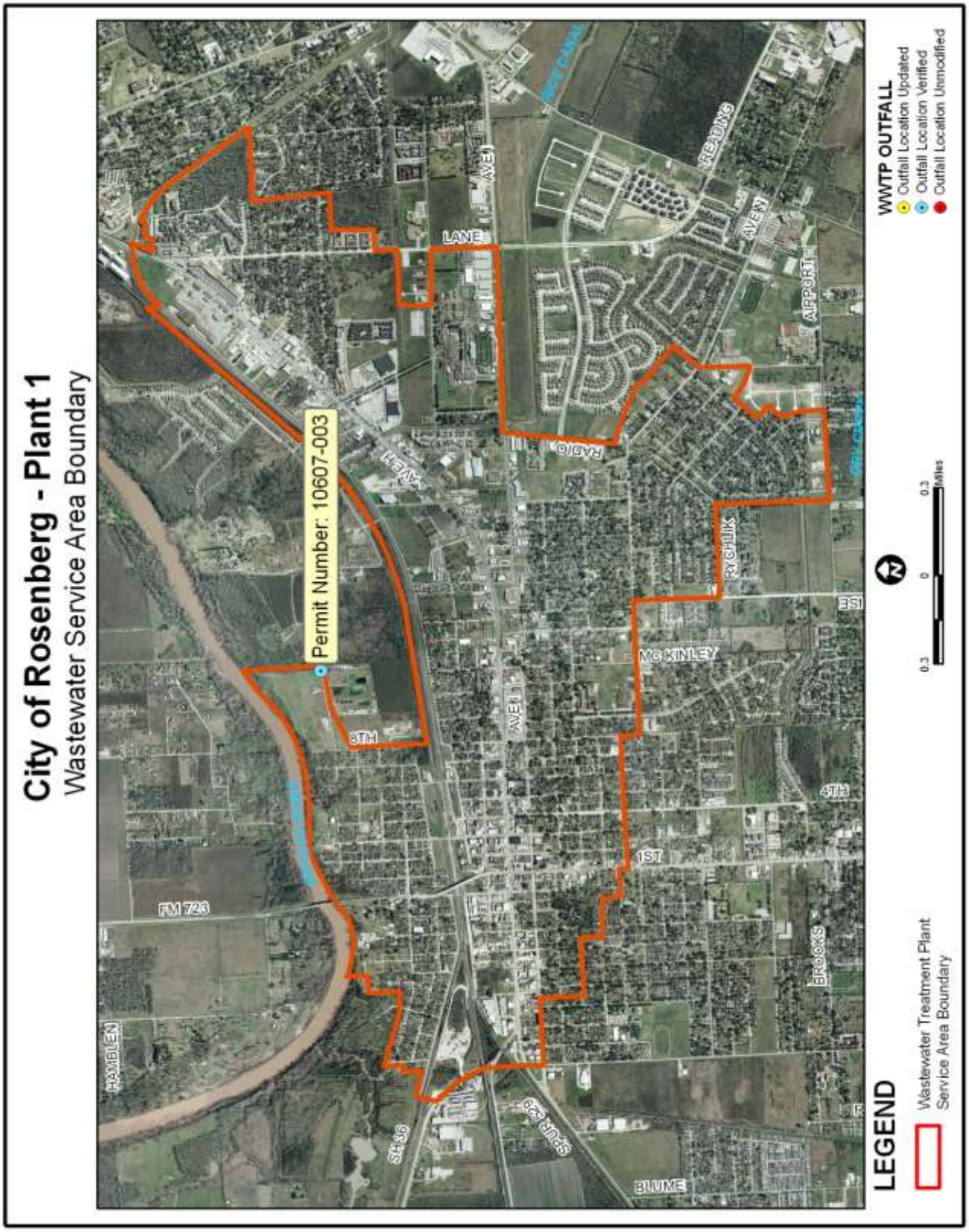

Figure 35 – City of Rosenberg [Plant 1]

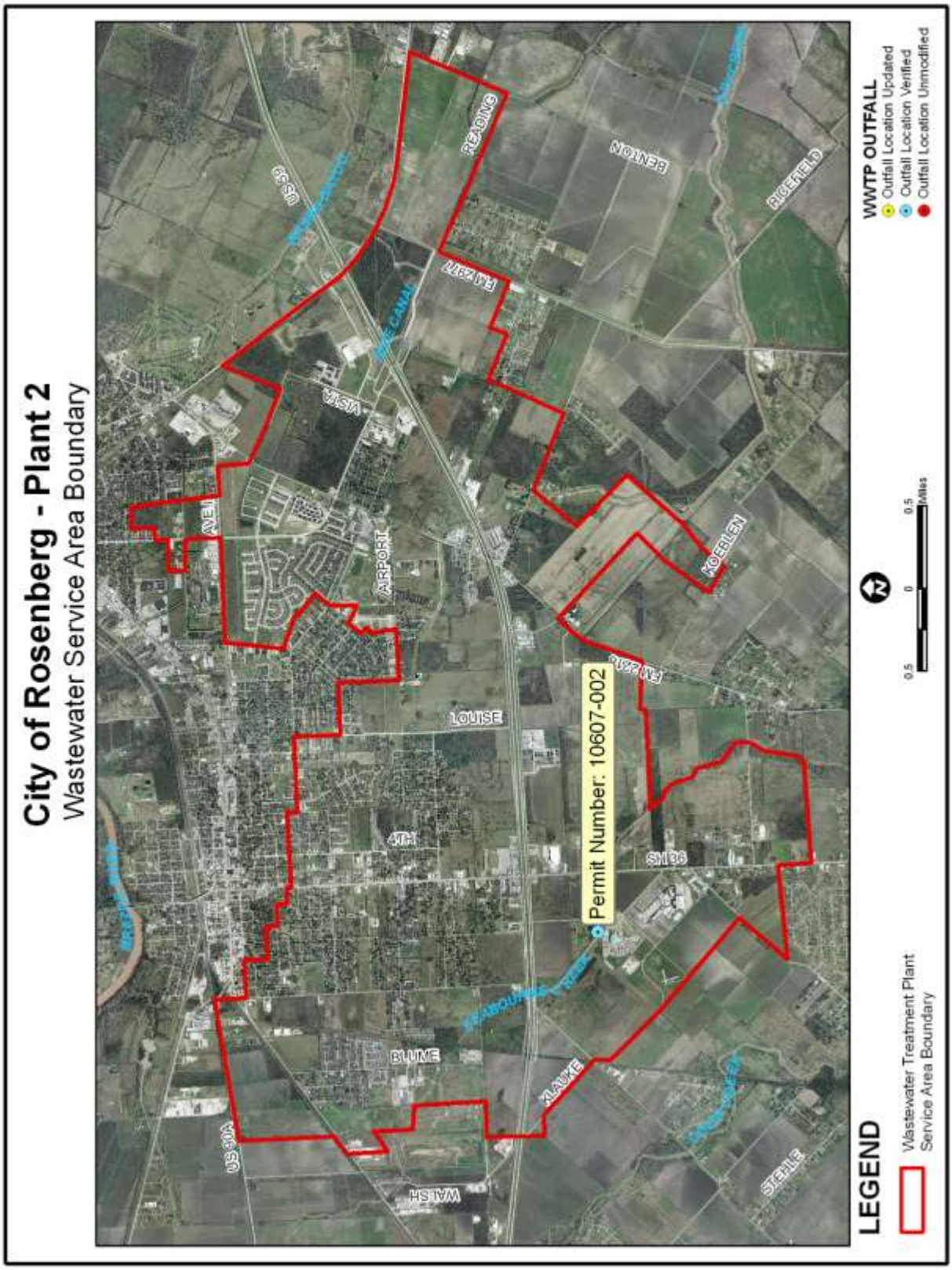

Figure 36 – City of Rosenberg [Plant 2]

Figure 37 – City of Rosenberg [Plant 3]

Figure 38 – Royalwood MUD

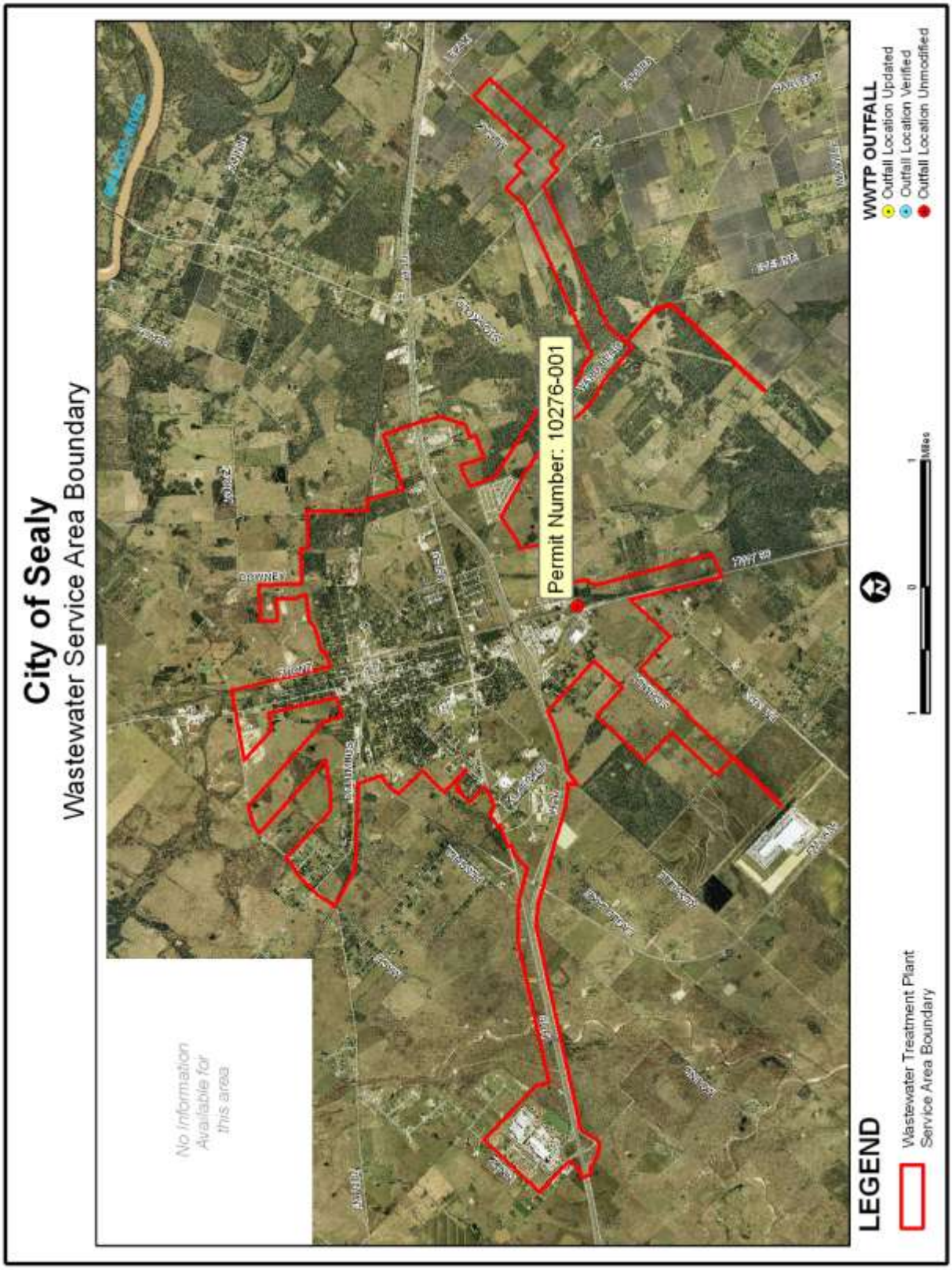

Figure 39 – City of Sealy

Figure 40 – Sheldon Road MUD [Rolling Hills]

Figure 41 – Sheldon Road MUD [Sheldon Woods]

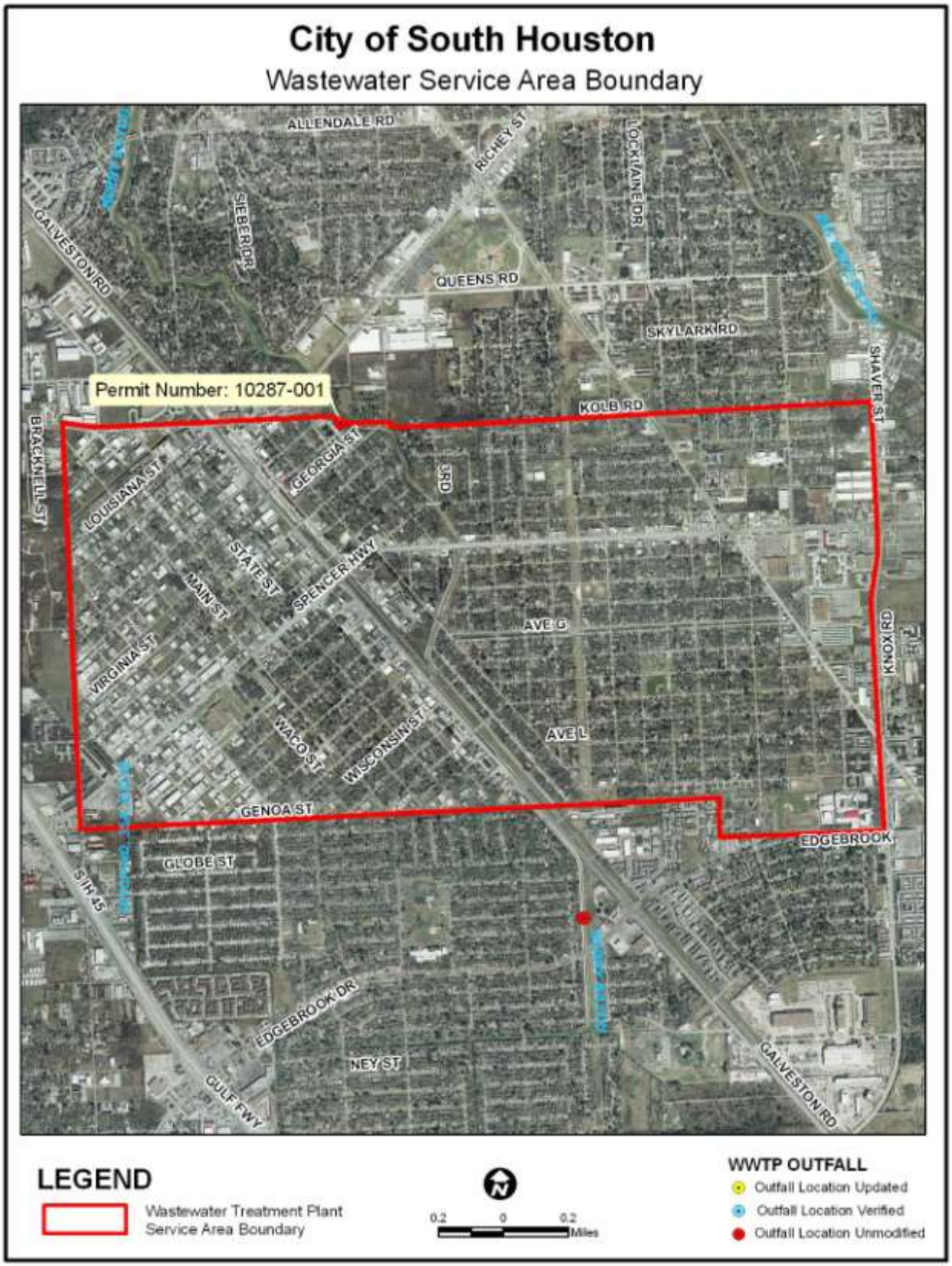

Figure 42 – City of South Houston

Figure 43 – Sunbelt FWSD [Fairgreen]

Figure 44 – Sunbelt FWSD [Heather Glen]

Figure 45 – Sunbelt FWSD [High Meadows]

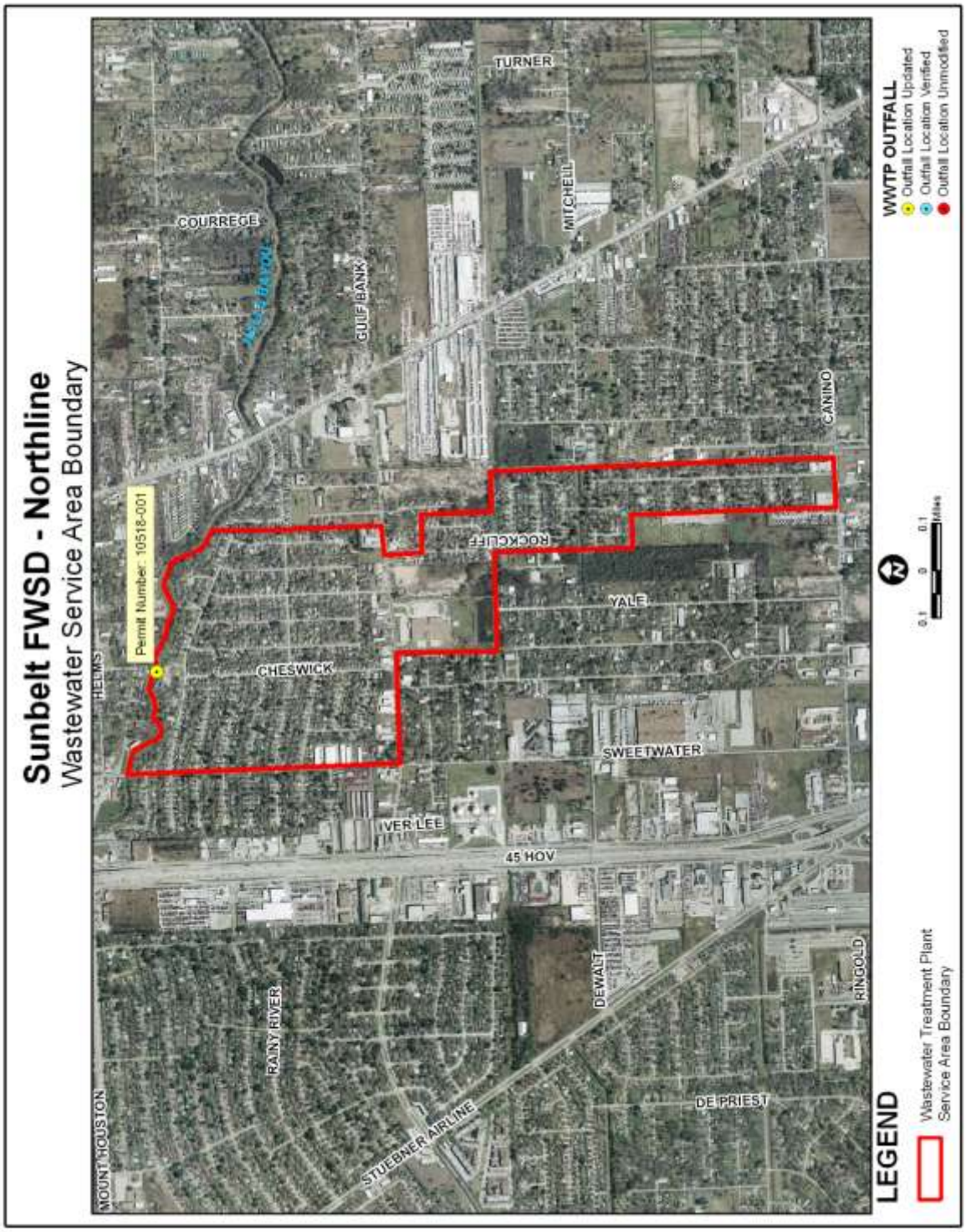

Figure 46 – Sunbelt FWSD [Northline]

Figure 47 – Sunbelt FWSD [Oakwilde]

Figure 48 – Sunbelt FWSD [Woodland Oaks]

Figure 49 – City of Sweeny

Figure 50 – City of Texas City

Figure 51 – City of Waller

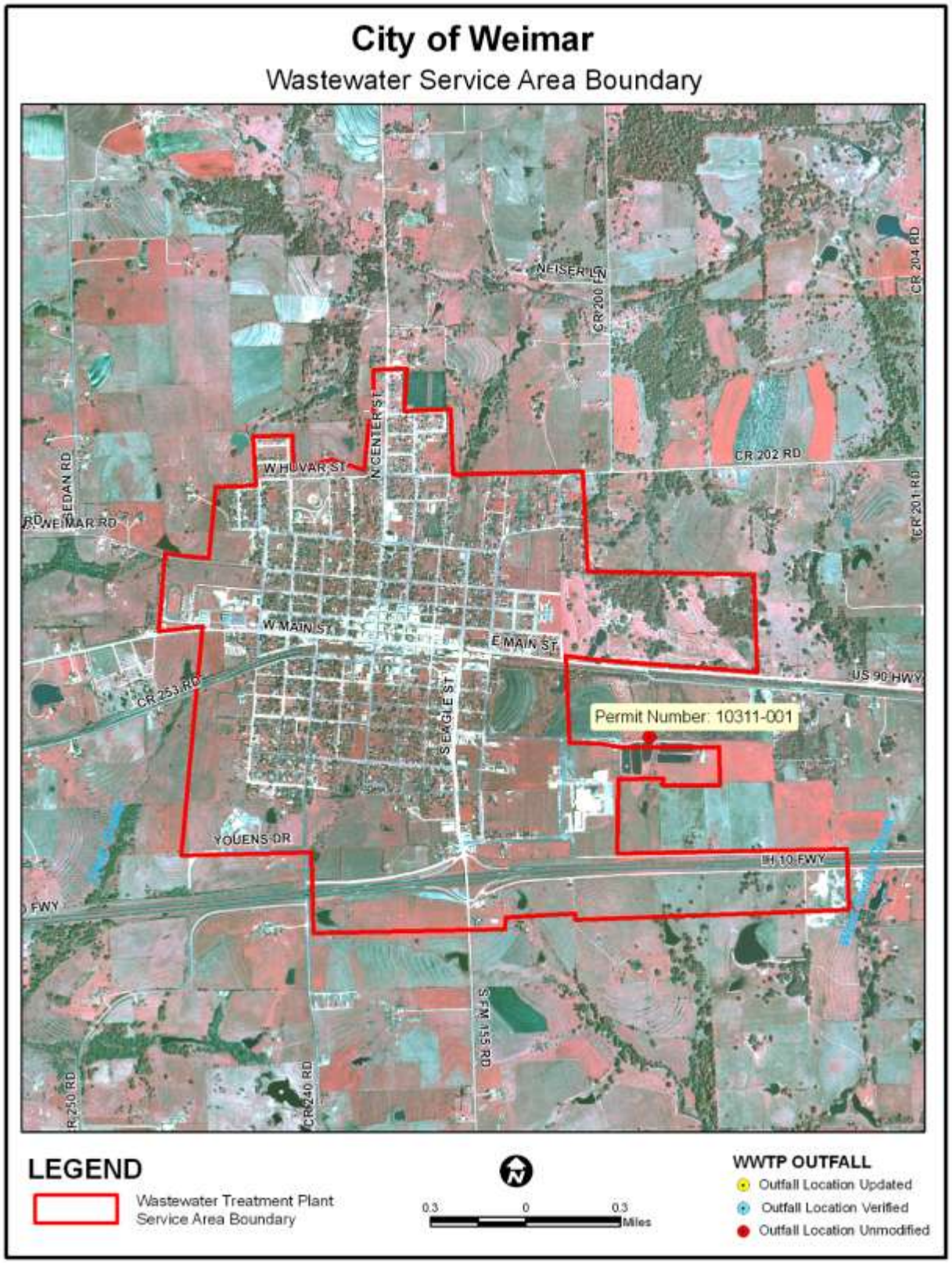

Figure 52 – City of Weimar

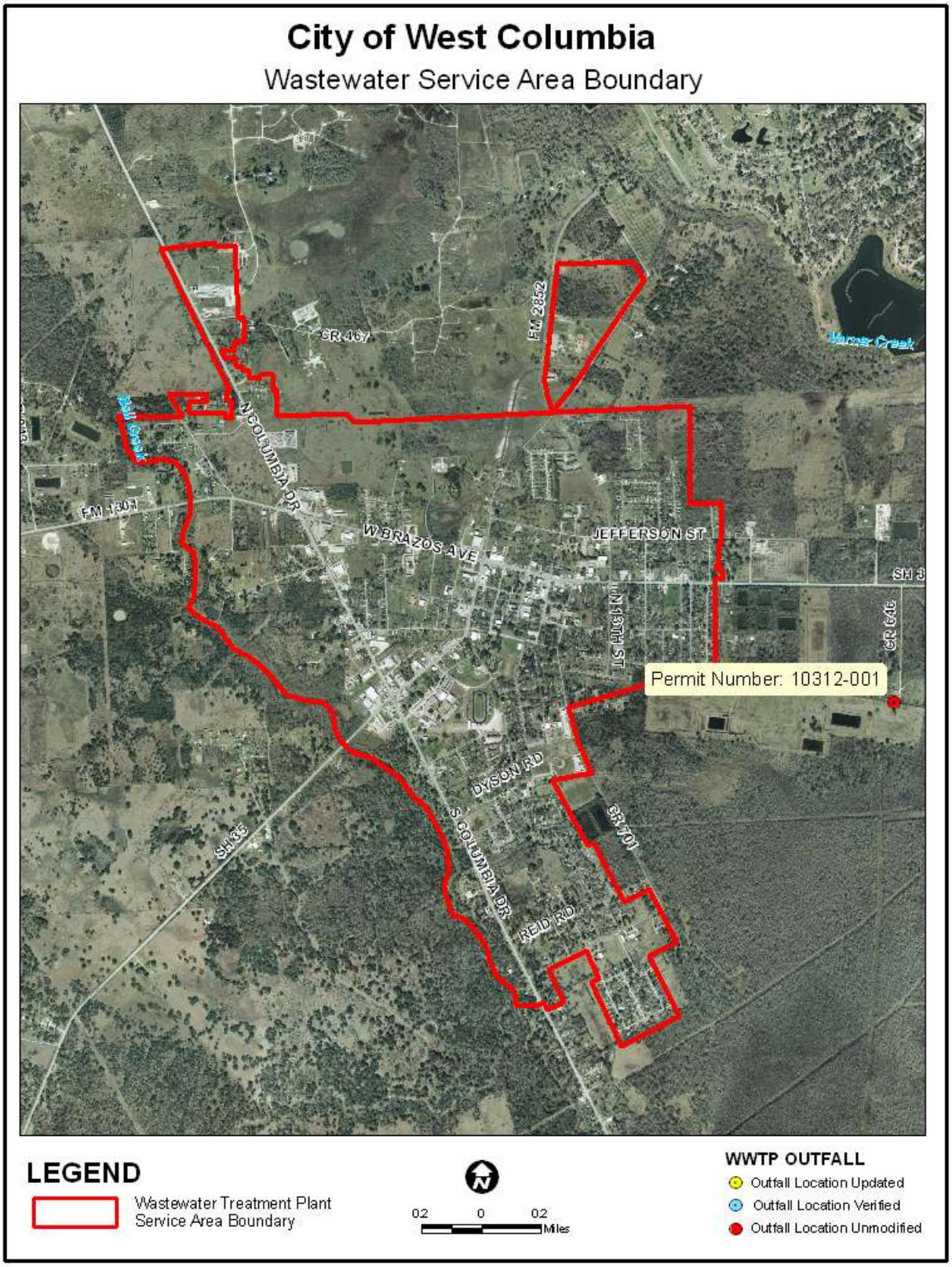

Figure 53 – City of West Columbia

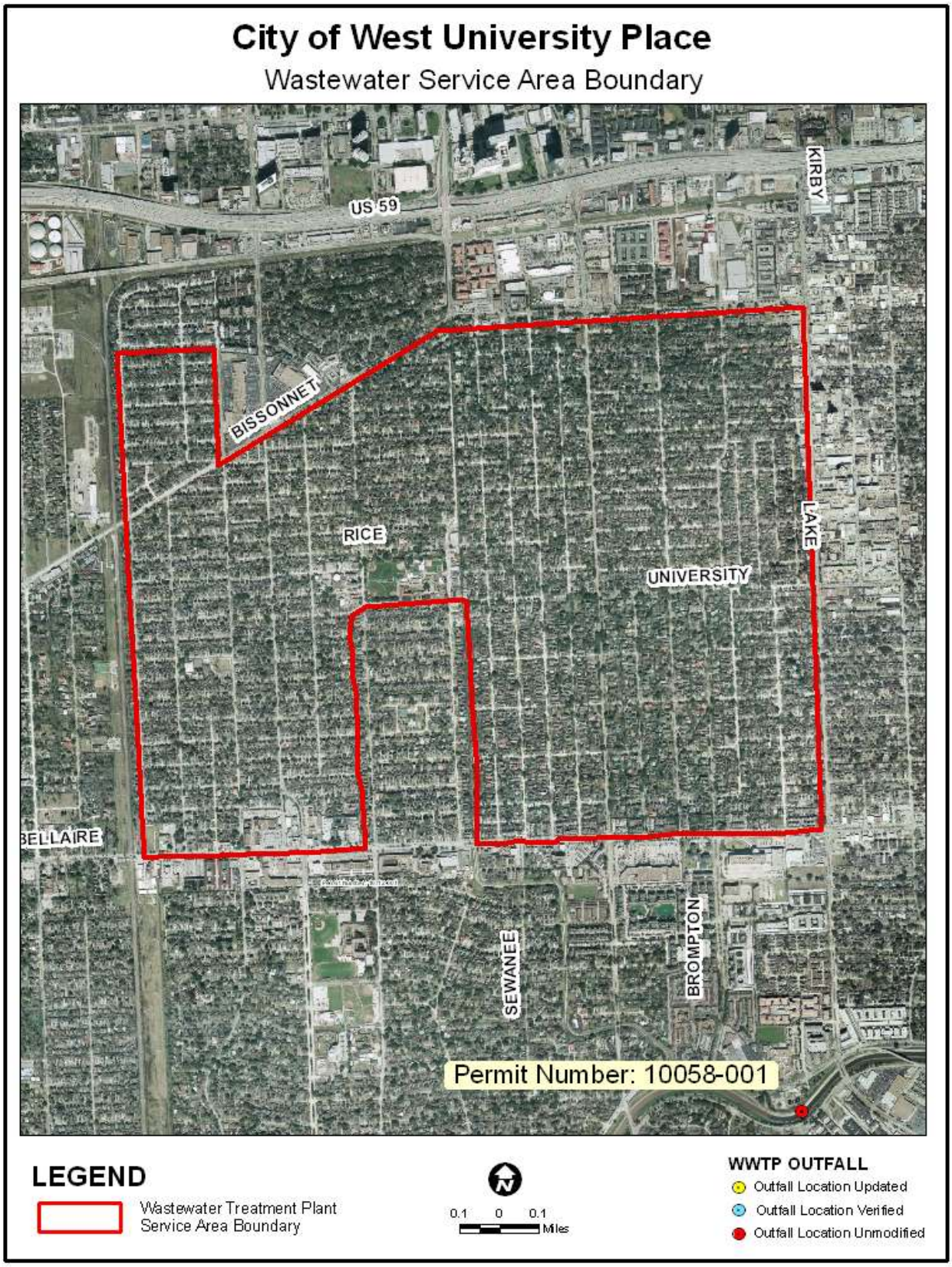

Figure 54 – City of West University Place

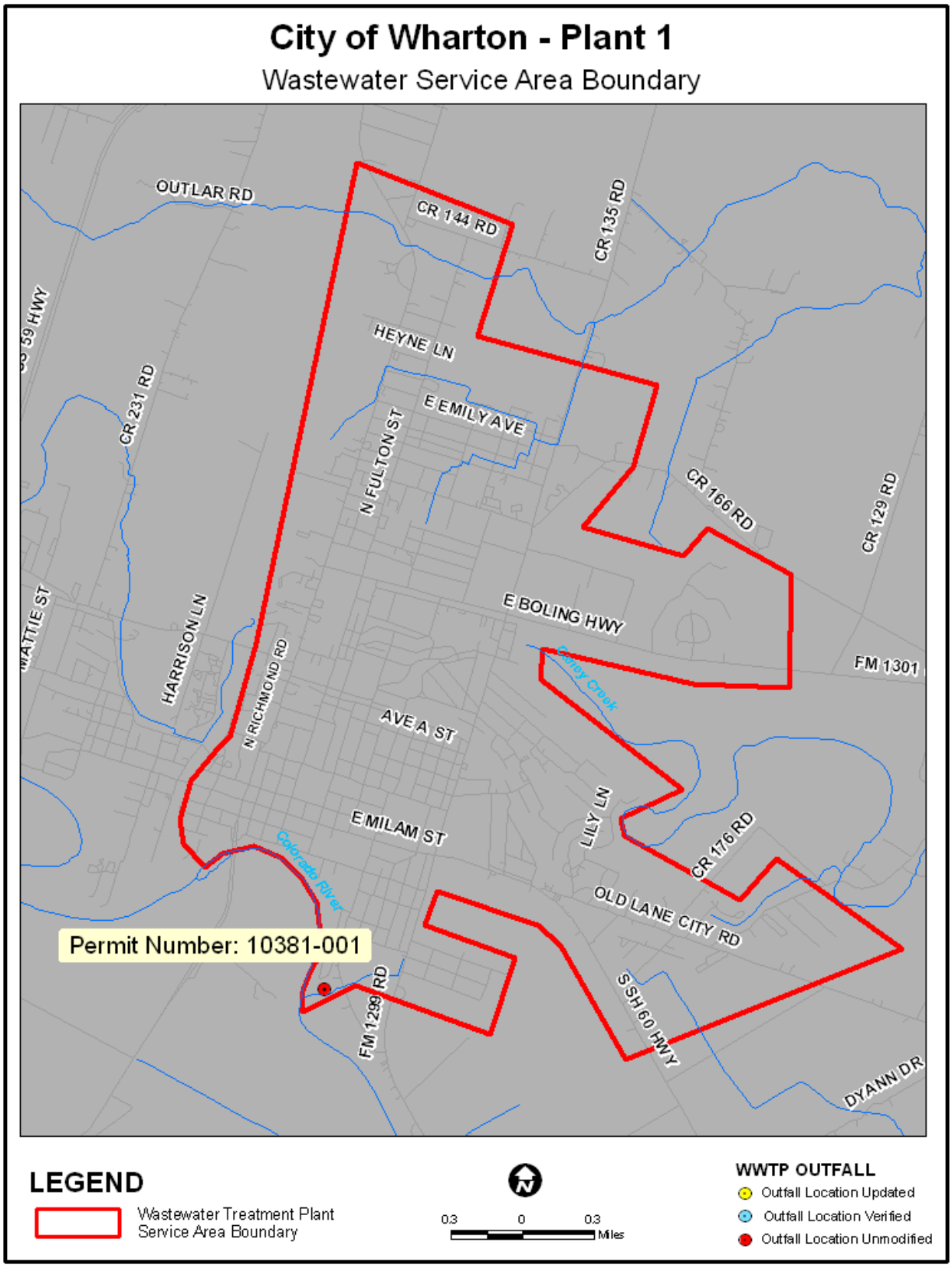

Figure 55 – City of Wharton [Plant 1]

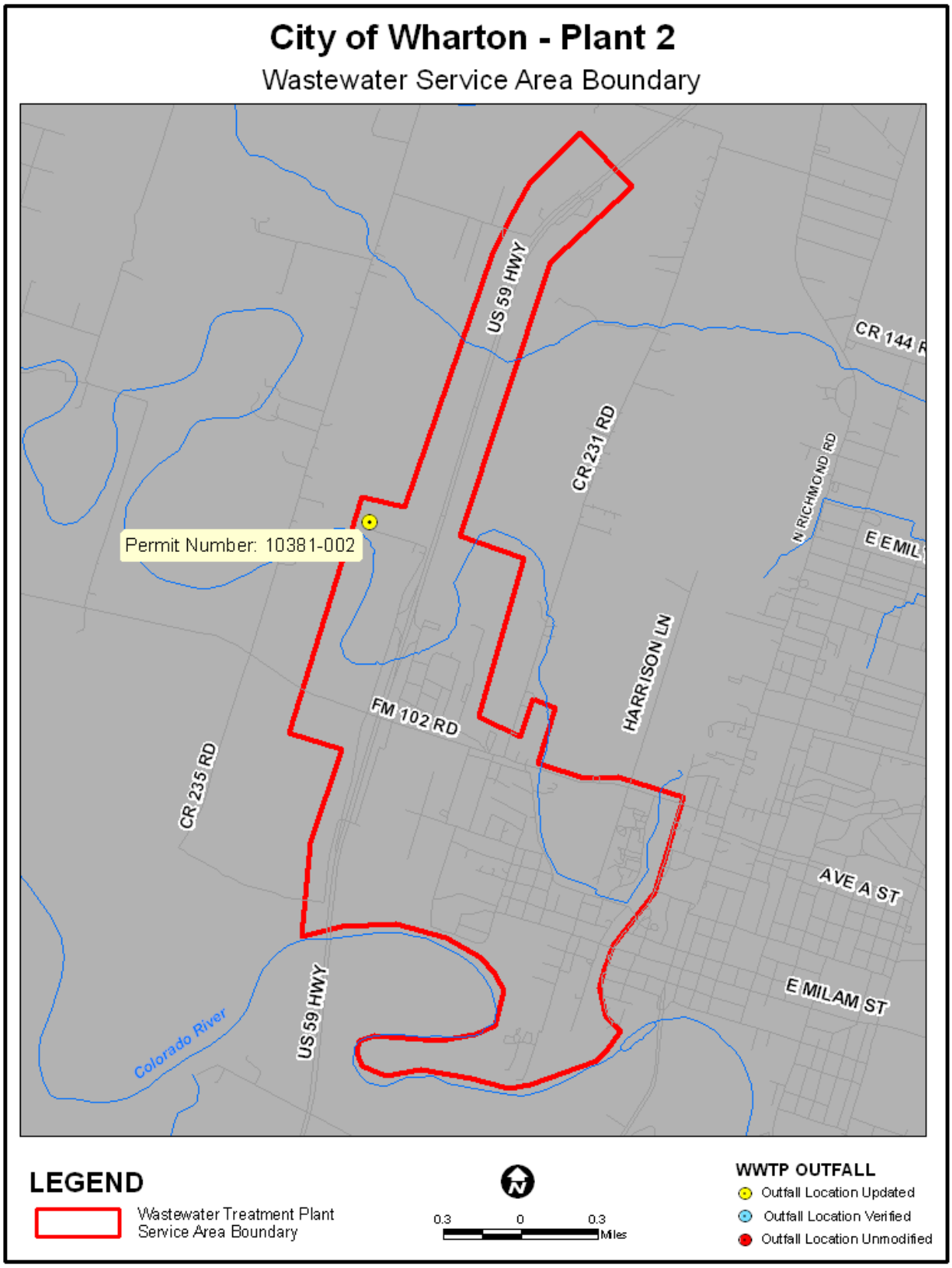

Figure 56 – City of Wharton [Plant 2]

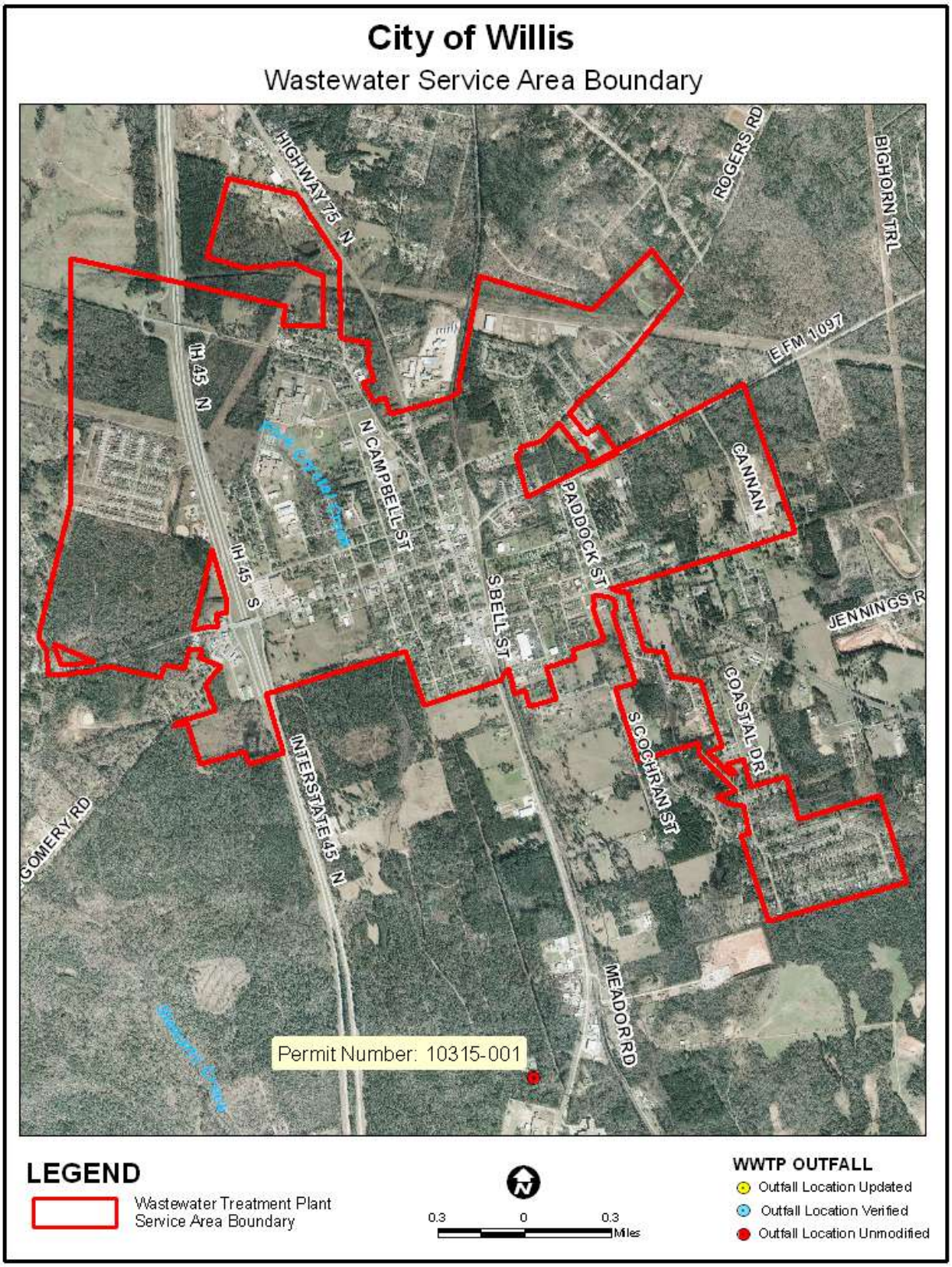

Figure 57 – City of Willis

Designated Management Agencies

In order to be designated as a management agency for wastewater collection or treatment, an entity must demonstrate the legal, institutional, managerial and financial capability necessary to carry out the entity's responsibilities in accordance with Section 208 (c) of the Clean Water Act (see list of requirements below). Before an entity can apply for a state revolving fund loan, it must be recommended for designation as the management agency in the approved WQMP. Designation of a management agency does not require the designated entity to provide wastewater services, but enables it to apply for grants and loans to provide the services. There were no requests for DMA status in this area.

Section 208 (c)(2) Requirements for Management Agency

208(c)(2)(A): to carry out portions of an area-wide waste treatment plant provisions.
208(c)(2)(B): to manage wastewater treatment works.
208(c)(2)(C): to design and construct, directly or by contract, new water works
208(c)(2)(D): to accept and utilize grants.
208(c)(2)(E): to raise revenues, including assessment of waste treatment charges.
208(c)(2)(F): to incur short and long-term indebtedness.
208(c)(2)(G): to assure community pays proportionate cost.
208(c)(2)(H): to refuse to receive waste from non-compliant dischargers.
208(c)(2)(I): to accept for treatment industrial wastes.

State Revolving Fund (SRF) Reviews Completed in Fiscal Year 2008

Facilities with wastewater treatment plant and transport infrastructure make loan applications to assist in the cost to the Texas Water Development Board. TCEQ reviews the applications. H-GAC completes SRF review as requested by TCEQ to determine if the applicant has conformed to regional water quality management plans. As part of the process, H-GAC determines population projections for the service area. Information on the applications reviewed during the 2009 WQMP Update period is shown in Table 4.

Table 4: SRF Reviews for 2009 WQMP Update

Planning Agency	Segment	County	Comments	Year	Population	Conformance
H-GAC	1006	Harris	Harris County WCID 36 Rehabilitation of collection system	2000 2005 2010 2015 2020	Concur with Texas Water Development Board	Yes
H-GAC	1102	Harris	Harris County WCID 89 Construction of Wastewater treatment Plant	2000 2005 2010 2015 2020	Did not Concur with Texas Water Development Board	Yes (if revised population #'s)

Recommendations for 2010 Water Quality Management Planning Activities

Population forecasts predict that an additional 3.5 million people will be living in the region by the year 2035. This growth will require supporting infrastructure to ensure safe and adequate drinking water. The wastewater treatment system will need to be adequately sized to protect our water bodies from increased pollutant loads. In addition to point sources, nonpoint sources (NPS) will continue to be a major contributor of pollutants to the region's water bodies. It is important to continue the education of municipal and county officials on steps they can take to mitigate NPS pollution. In view of these water quality issues, staff have attempted to identify activities that should be continued for H-GAC to provide the most comprehensive water quality management planning effort possible. The following recommendations are proposed for inclusion in the 2010 Water Quality Management Planning Work Plan:

1. Continue update of service area boundaries and incorporate into H-GAC's Geographic Information System (GIS) database. Utilize service boundary information from TCEQ.

2. Continue development, maintenance, and integration of wastewater treatment facility and related data into the H-GAC Data Clearinghouse.

3. Assist applicants for state revolving fund loans and the Texas Commission on Environmental Quality (TCEQ) in resolving conflicts between proposed project data and the data in the regional water quality management plan (WQMP). Review applications for funding from sources other than SRF for conformance with the WQMP and assist TCEQ in wastewater permit reviews.

4. Provide staff for the H-GAC Natural Resources Advisory Committee to deal with regional watershed management issues. Coordinate with major state and federal water programs and local governments, targeting prevention of duplication of efforts and to promote watershed management. Continue participation in stakeholder activities and information-sharing events related to the Total Maximum Daily Load Program not covered under current TMDL contracts with TCEQ.

5. Provide education to municipal officials, developers, construction companies, septic system installers and the general public on nonpoint source pollution through educational materials and H-GAC's Clean Waters Initiative workshops.

6. Work with cities in the Coastal Zone that are not covered under Phase 1 or Phase 2 stormwater permits to begin planning for BMP implementation for new and existing development, construction site management and watershed protection management measures.

7. Support watershed planning and source water protection in the Lake Houston watershed by operating continuous water quality monitoring sites on the West Fork of the San Jacinto River.

8. Complete analysis to determine what role age of infrastructure in sanitary sewer systems plays in bacteria levels in adjacent waterbodies.

9. Continue to look into the consolidation of wastewater treatment plants, start to investigate how intervening issues such as water supply, water reuse and cost might impact the ability or desire of individual districts to move toward wastewater treatment service consolidation.

10. Complete Halls Bayou – Westfield Estates and Bastrop Bayou Watershed Protection Plan

H-GAC will discontinue estimating wastewater treatment plant expansion needs based on population forecasts.

Plan Participants (Not for Certification)

2009 H-GAC Board of Directors

AUSTIN COUNTY
County Judge Carolyn C. Bilski
Commissioner David Hubenak

BRAZORIA COUNTY
Commissioner Mary Ruth Rhodenbaugh
Commissioner Stacy Adams

CHAMBERS COUNTY
Commissioner Gary Nelson
Commissioner Bill Wallace

COLORADO COUNTY
County Judge A.G. Jamison
Commissioner Darrell Gertson

FORT BEND COUNTY
Commissioner Andy Meyers
County Judge Robert E. Hebert

GALVESTON COUNTY
Commissioner Ken Clark
Commissioner Pat Doyle

HARRIS COUNTY
County Judge Ed Emmett
Commissioner Sylvia Garcia

LIBERTY COUNTY
Commissioner Todd Fontenot
County Judge Phil Fitzgerald

MATAGORDA COUNTY
County Judge Nate McDonald
Commissioner Dan Pustka

MONTGOMERY COUNTY
Commissioner Craig Doyal
Commissioner Mike Meador

WALKER COUNTY
Commissioner B.J. Gaines, Jr.
County Judge Danny Pierce

WALLER COUNTY
Commissioner Glenn Beckendorff
Commissioner Terry Harrison

WHARTON COUNTY
Commissioner Chris King
County Judge John Murrile

CITY OF BAYTOWN
Councilman Brandon Capetillo
Mayor Stephen DonCarlos

CITY OF CONROE
Councilman Toby Powell
Councilman Jay Martin

CITY OF DEER PARK
Councilman Thane Harrison
Councilwoman Beckie Stockstill- Cobb

CITY OF FRIENDSWOOD
Councilmember Andy Rivera
Councilmember Michael E. Barker

CITY OF GALVESTON
Mayor Lyda Ann Thomas
Council Member Susan Fennewald

CITY OF HOUSTON
Council Member Anne Clutterbuck
Council Member Mike Sullivan
Council Member James Rodriguez
Council Member Sue Lovell

CITY OF HUNTSVILLE
Mayor James M. Turner
Councilman Mac Woodward

CITY OF LA PORTE
Councilman Chuck Engelken, Jr.
Councilperson Louis Rigby

CITY OF LAKE JACKSON
Mayor Bob Sipple
Councilman Bob Geter

CITY OF LEAGUE CITY
Mayor Toni Randall

CITY OF MISSOURI CITY
Councilman Brett Kolaja

CITY OF PASADENA
Vacant

CITY OF PEARLAND
Mayor Tom Reid
Councilwoman Helen Beckman

CITY OF SUGAR LAND
Council Member Thomas Abraham
Council Member Donald L. Smithers

CITY OF TEXAS CITY
Commissioner Tommy Clark
Commissioner J.W. "Scooter" Wilson, Jr.

HOME RULE CITIES
Councilman Pat McLaughlan, Bellaire
Councilman Cecil Willis, Stafford
Councilman Kerry Neves, Dickinson
Councilman Bob Fry, West Univ. Place

GENERAL LAW CITIES
Mayor Delores Martin, Manvel
Councilwoman Kay Mudd, Iowa Colony
Alderman Terry Henley, Meadows Place
Alderman Wayne Browning, Bellville

ISDs
Trustee Louis Tucker, Waller ISD
Trustee Suzy Roberts, Pearland ISD

Note: Names of Alternates are indented

H-GAC - Natural Resources Advisory Committee

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BRAZORIA COUNTY
Jeff Brennan

CHAMBER OF COMMERCE
Jamie Brewster

COLORADO COUNTY
Kathy Burris

MONTGOMERY COUNTY
Patrick Buzbee

GALVESTON BAY FOUNDATION
Glenda L. Callaway

SOIL & WATER CONSERVATION
Del Cannon

INDUSTRY
Dennis Caputo

CHAMBER OF COMMERCE
Jim Dannenbaum

RIVER AUTHORITIES
Reed Eichelberger

GULF COAST WASTE DISPOSAL AUTHORITY
Lori Gernhardt

INDUSTRY
Aston Hinds

AUSTIN COUNTY
David Hubenak

CITY OF HOUSTON
Andy Icken

WALKER COUNTY
Andrew Isbell

PROFESSIONAL ORGANIZATIONS
Jim Joyce

CITIZENS
Jim Kachtick

HC PUBLIC HEALTH & ENVIR. SERVICES
B.Z. Karachiwala

OTHER CITIES
Brett Kolaja

HARRIS COUNTY
Carole J. Lamont

OTHER CITIES
Sarah Metzger

CONSULTING ENGINEERS
Jack Miller

BUILDERS/DEVELOPERS
Tom Northrup

MATAGORDA COUNTY
John p. O'Connell

LIBERTY COUNTY
Ellis Pickett

PUBLIC HEALTH
Ronald Shultz

ENVIRONMENTAL GROUP
Linda Shead

CITIZENS
Brian R. Shmaefsky

FORT BEND COUNTY
Adam Smith

HARRIS COUNTY
Mike Talbott

ELECTRIC UTILITY
Kerry Whelan

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