1.0 INTRODUCTION

This report was prepared for the City of Dade City to provide an overview of the existing stormwater management challenges that the City faces. The report is intended to assist the City for future informed decision-making when evaluating specific stormwater improvements, and in maintaining compliance with evolving stormwater regulations. Consideration of environmental issues associated with the proposed master plan‟s flood control projects is also discussed.

1.1 Overview

The City of Dade City has a 1965 Master Plan Report for Storm Drainage Facilities. This report served to identify needs for flood control and prevention at a time when west central Florida had been through several significant hurricane seasons and flooding along the Withlacoochee River and other areas was severe. The report identified the backwatering effects into the eastern low lying areas within the City that occur when the Withlacoochee River reaches flood stage levels. The report also concluded that the land use changes and introduction of impervious surfaces associated with the City‟s development process resulted in increased stormwater runoff and flooding of areas of the town.

In 1987, Pasco County and the Southwest Florida Water Management District (SWFWMD) commissioned a study of the Duck Lake Watershed in which Dade City is centrally located. Many of the conceptual improvements discussed in this report were proposed within unincorporated Pasco County and did not necessarily affect the City‟s drainage system.

In late fall of 2010, the City commissioned BCI Engineers & Scientists, Inc. (now doing business as AMEC Environment & Infrastructure, Inc. (AMEC)) to update the 1965 Master Plan. The updated master plan was to consist of the following elements:

1. Update the Hydraulic Inventory - updates the list of pipes, inlets, pumps, conveyance systems and puts them into a geographic information system (GIS).
2. Basin Delineation Update - updates the drainage basins throughout the City to allow for a more accurate prediction of problem areas and concept improvements.
3. Existing Conditions Assessment - Estimate the flood stages under existing conditions for various design storm events.
4. Alternatives Analysis - Provide conceptual improvements to reduce flooding within the identified problem areas for existing conditions.
5. Present a draft Master Plan to the City for comments and present the final Master Plan to the City when completed.

This report is comprised of the following chapters with a brief description of what each chapter entails.

Chapter 1 - Introduction- provides an overview of the report and some background information on the purpose of the report.

Chapter 2 - Watershed Description- describes the physical characteristics of the watershed including soils, physiography, hydrology and land use.

Chapter 3 - Major Drainage Systems- describes the primary drainage basins within the City.

Chapter 4 - Hydraulic/Hydrologic Model Methodology- describes the flood routing modeling approach used for this project.

Chapter 5 - Level of Service- establishes the standards by which the City defines extent of flooding.

Chapter 6 - Existing Conditions Level of Service- provides the modeling results for various design rainfall events for current conditions.

Chapter 7 - Existing Environmental Regulations and Existing Water Quality Conditions- provides a general description of the pertinent regulations of stormwater and of the water quality condition of local water bodies.

Chapter 8 - Pollutant Load Modeling- provides an estimate of the pollutant loads discharged from the City‟s major outfalls under existing conditions.

Chapter 9 - Existing Conditions Water Quality Level of Service- generally describes the current level of stormwater treatment provided by the City‟s stormwater management system.

Chapter 10 - Alternatives Analysis- presents conceptual alternatives for reduced flooding in problem areas and the associated costs of those improvements.

Chapter 11 - Recommendations- presents a summary of the recommended alternatives

2.0 WATERSHED DESCRIPTION

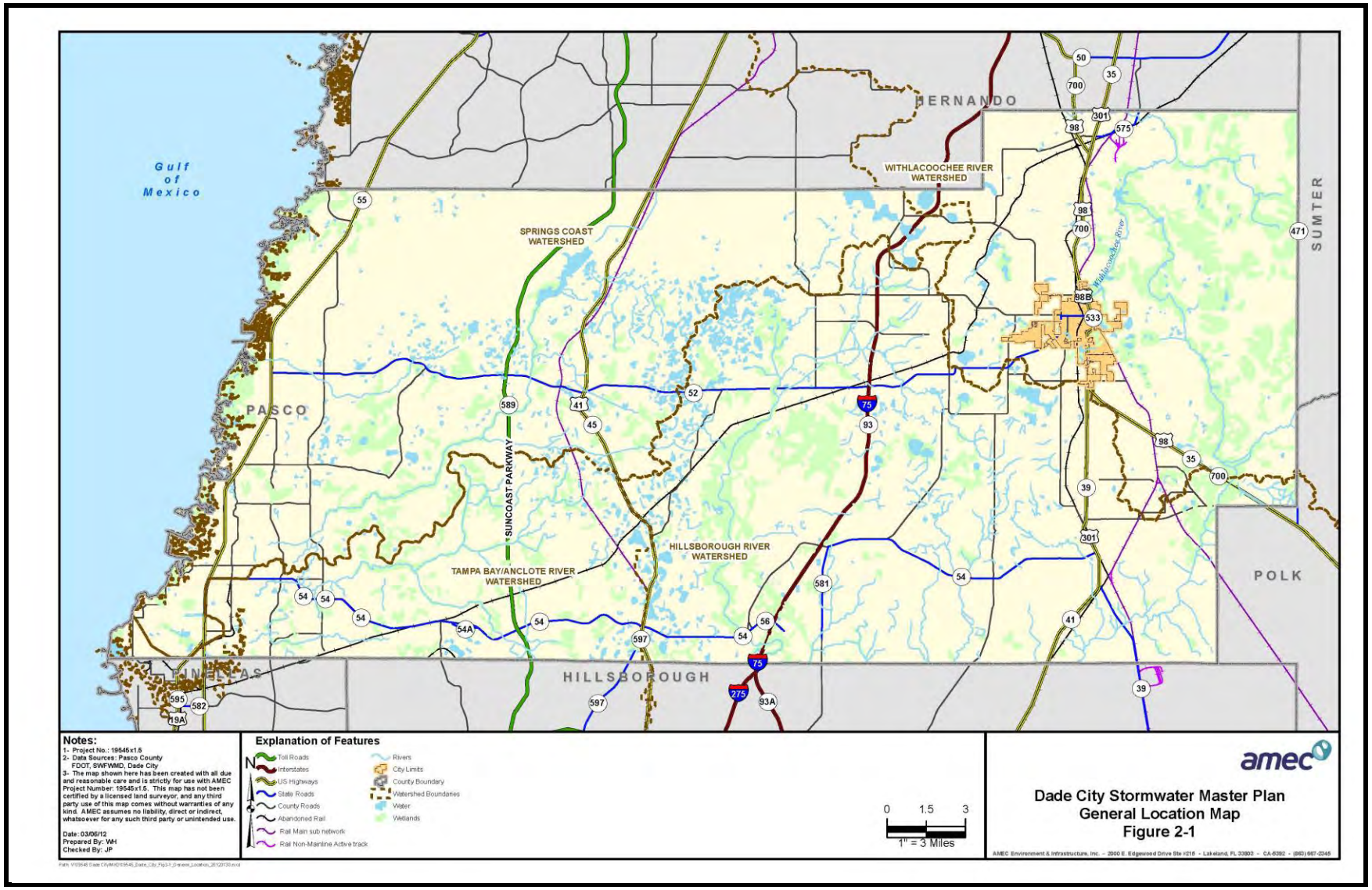
2.1 Overview

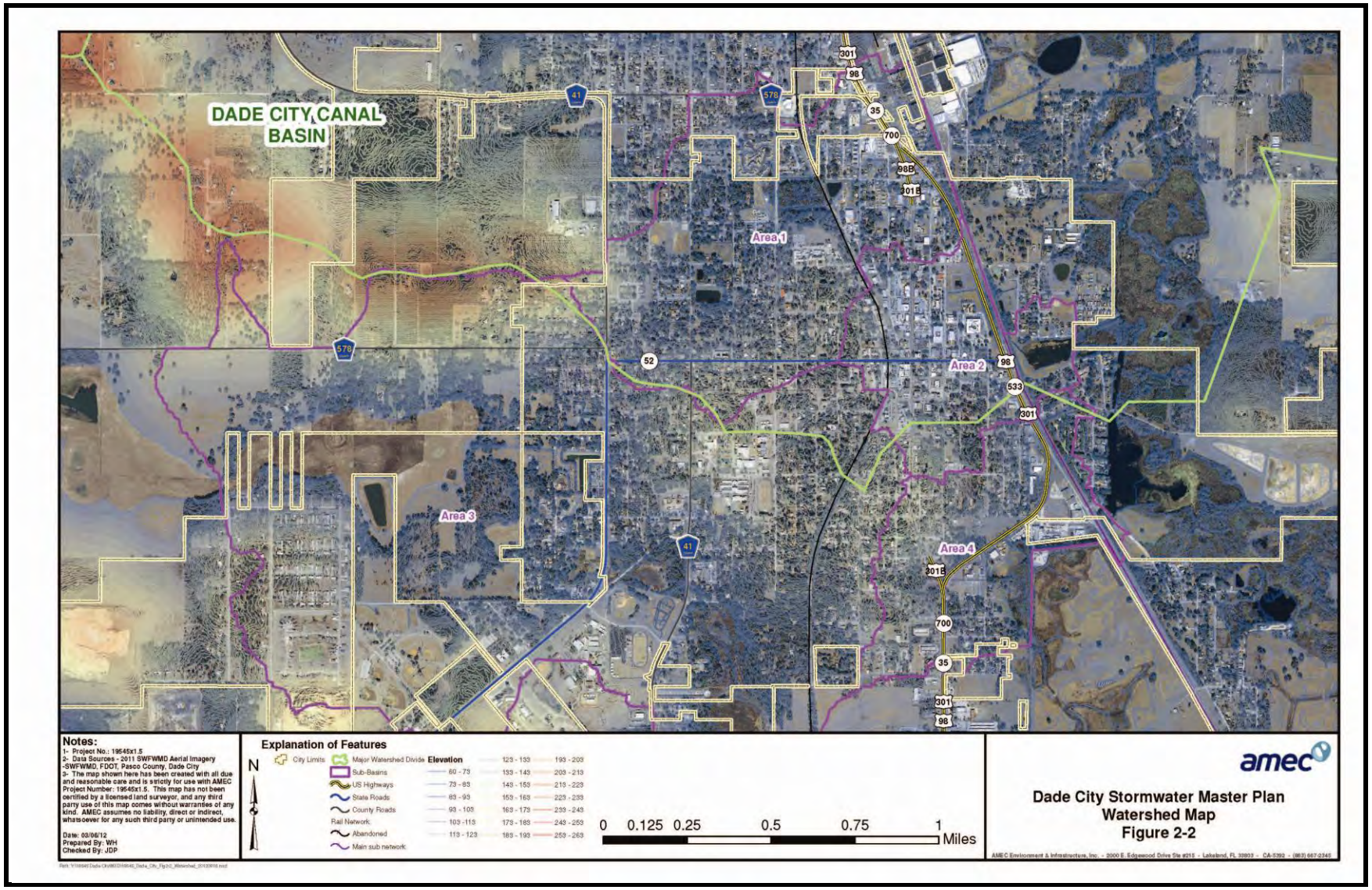
The City of Dade City incorporated limits include approximately 3920 acres or 6.1 square miles in eastern Pasco County (**Figure 2-1**). The vast majority of this area (except for a small portion at the extreme southern end) contributes to the Withlacoochee River Watershed (WRW) while the small section at the south end drains to the Hillsborough River Watershed (HRW). The area draining to HRW is an insignificant portion of the overall city's jurisdiction; does not experience any known drainage problems; and as such will not be discussed further in this report. The remainder of the city falls within the 40.2 square mile "Duck Lake" portion of the WRW. This Duck Lake area has been studied and modeled extensively by SWFWMD and is detailed in the District's 1987's "Duck Lake Stormwater Management Master Plan." Dade City is located approximately at the center of the Duck Lake basin, which generally extends from St. Leo and San Antonio to the west, across Highway US 98 to Duck Lake (southeast of Dade City) which then serves as one of several primary headwaters for the Withlacoochee River. The Duck Lake Master Plan watershed limits and the drainage basin delineations developed to perform the storm water analysis for this report are shown in **Figure 2-2**.

Dade City contains a diversity of land use types but is primarily dominated by low and medium density residential, agricultural, wetlands, commercial and institutional land uses. The commercial and industrial areas are scattered throughout the city while the residential is generally concentrated in the north and west and the agricultural is primarily located in the south and the west sections of town. The watershed drains primarily from the high sand hills along the western side of town towards the east and into the low wetlands and marshes of the Withlacoochee River floodplain. Due to the rolling topography and limited drainage infrastructure, there are numerous closed drainage basins that have no surface discharge and many others that have a discharge conveyance that is no longer adequate to handle the stormwater rates and volumes generated under the City's current state of development. These two factors are primary sources of the flooding problems that are experienced by the City. Many of the closed drainage basins rely on natural percolation of the stormwater into the ground as their only discharge, whereas four of the closed basins utilize stormwater pumping stations to discharge the flood waters.

Topography within the watershed varies from a high of over 200 feet North American Vertical Datum (NAVD '88) in the western sand hills to a low of 75 feet along US Highway 301/98 in the southern portions of the city as depicted in **Figure 2-3** (Datum is NAVD '88). Topography is also depicted on 24" x 36" sheets, located in the pockets accompanying this report, as **Figures 2-3A**. All of the areas that have a surface discharge, with the exception of the small portion draining to the HRW, ultimately drain to the Withlacoochee River floodplain. That floodplain has a published 100-year flood elevation of approximately 78 feet National Geodetic Vertical Datum (NGVD '29) which corresponds approximately to 77.1 feet (NAVD '88). As confirmed by **Figure 2-3** many areas in the eastern portions of the city are near or even below this elevation. The result is that even if drainage conveyances exist, they are of limited value during flood events

because the flood elevation of the Withlacoochee River floodplain is higher than the ground elevations in these low portions of the city. The Withlacoochee River flood waters "spill out" into the floodplain eventually reaching the City limits. In conjunction with closed basins and limited drainage infrastructure discussed earlier, the high Withlacoochee River flood elevations (sometimes referred to as "tailwater" conditions) prove to be a major cause of flooding within the city. These issues will be discussed in more detail later in this report.


Gulf of Mexico
HERNANDO
SUMTER
POLK
PASCO
PINELLAS
HILLSBOROUGH
WITHLACOOCHEE RIVER WATERSHED
SPRINGS COAST WATERSHED
SUNCOAST PARKWAY
HILLSBOROUGH RIVER WATERSHED
TAMPA BAY/ANCLOTE RIVER WATERSHED
Withlacoochee River
Notes:
1- Project No.: 19545x1.5
2- Data Sources: Pasco County FDOT, SWFWMD, Dade City
3- The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number: 19545x1.5. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.
Date: 03/06/12
Prepared By: WH
Checked By: JP
Explanation of Features
Toll Roads
Interstates
US Highways
State Roads
County Roads
Abandoned Rail
Rail Main sub network
Rail Non-Mainline Active track
Rivers
City Limits
County Boundary
Watershed Boundaries
Water
Wetlands
N
0 1.5 3
1" = 3 Miles
amec
Dade City Stormwater Master Plan
General Location Map
Figure 2-1


DADE CITY CANAL BASIN
Area 1
Area 2
Area 3
Area 4
301
98
41
578
35
700
98B
301B
52
533
Notes:
1- Project No.: 19545x1.5
2- Data Sources - 2011 SWFWMD Aerial Imagery -SWFWMD, FDOT, Pasco County, Dade City
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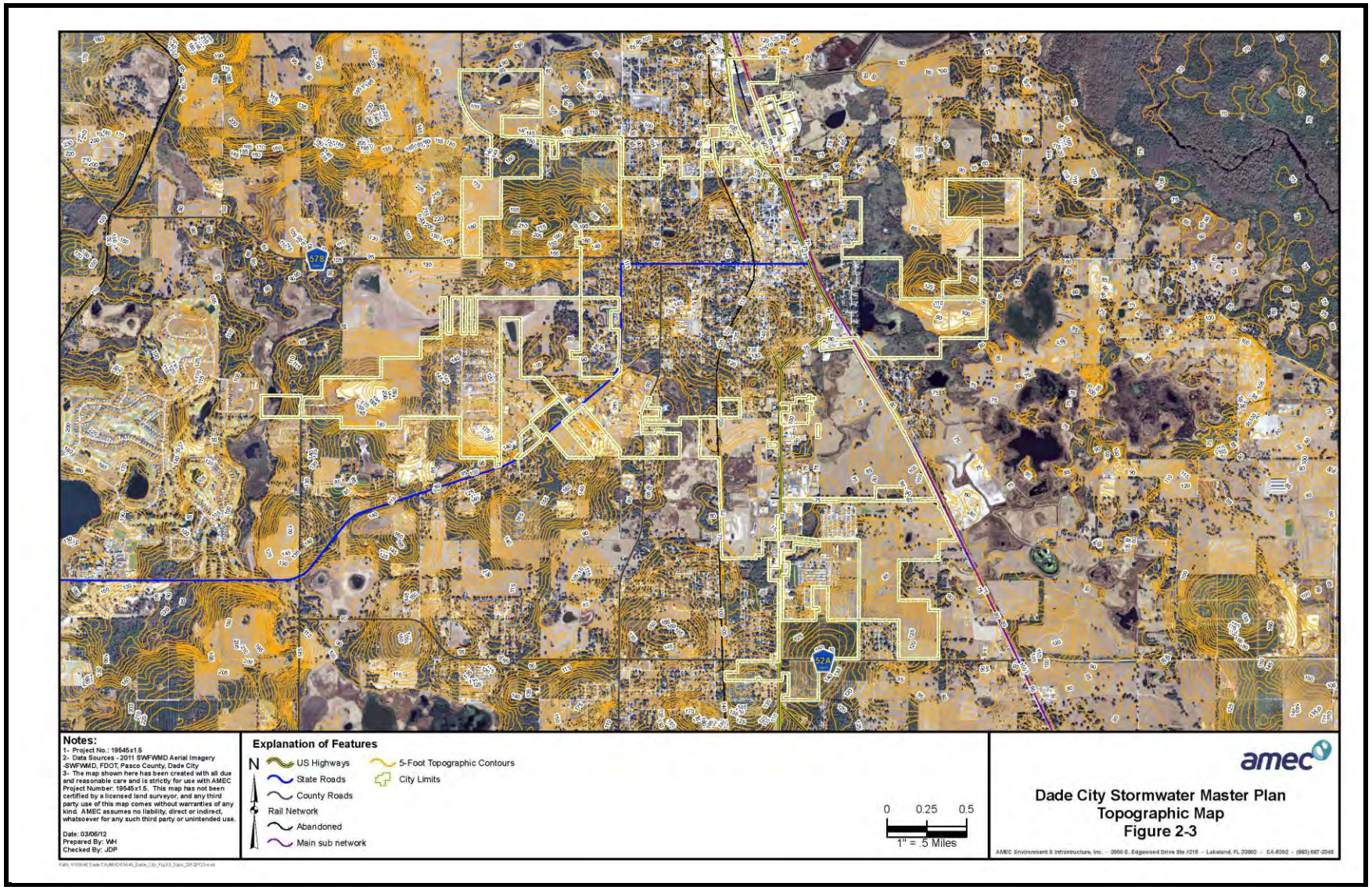
Checked By: JDP
Explanation of Features
City Limits
Major Watershed Divide
Sub-Basins
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
Elevation
60 - 73
73 - 83
83 - 93
93 - 103
103 - 113
113 - 123
123 - 133
133 - 143
143 - 153
153 - 163
163 - 173
173 - 183
183 - 193
193 - 203
203 - 213
213 - 223
223 - 233
233 - 243
243 - 253
253 - 263
N
0 0.125 0.25 0.5 0.75 1 Miles
amec
Dade City Stormwater Master Plan
Watershed Map
Figure 2-2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1- Project No.: 19545x1.5
2- Data Sources - 2011 SWFWMD Aerial Imagery -SWFWMD, FDOT, Pasco County, Dade City
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Date: 03/06/12
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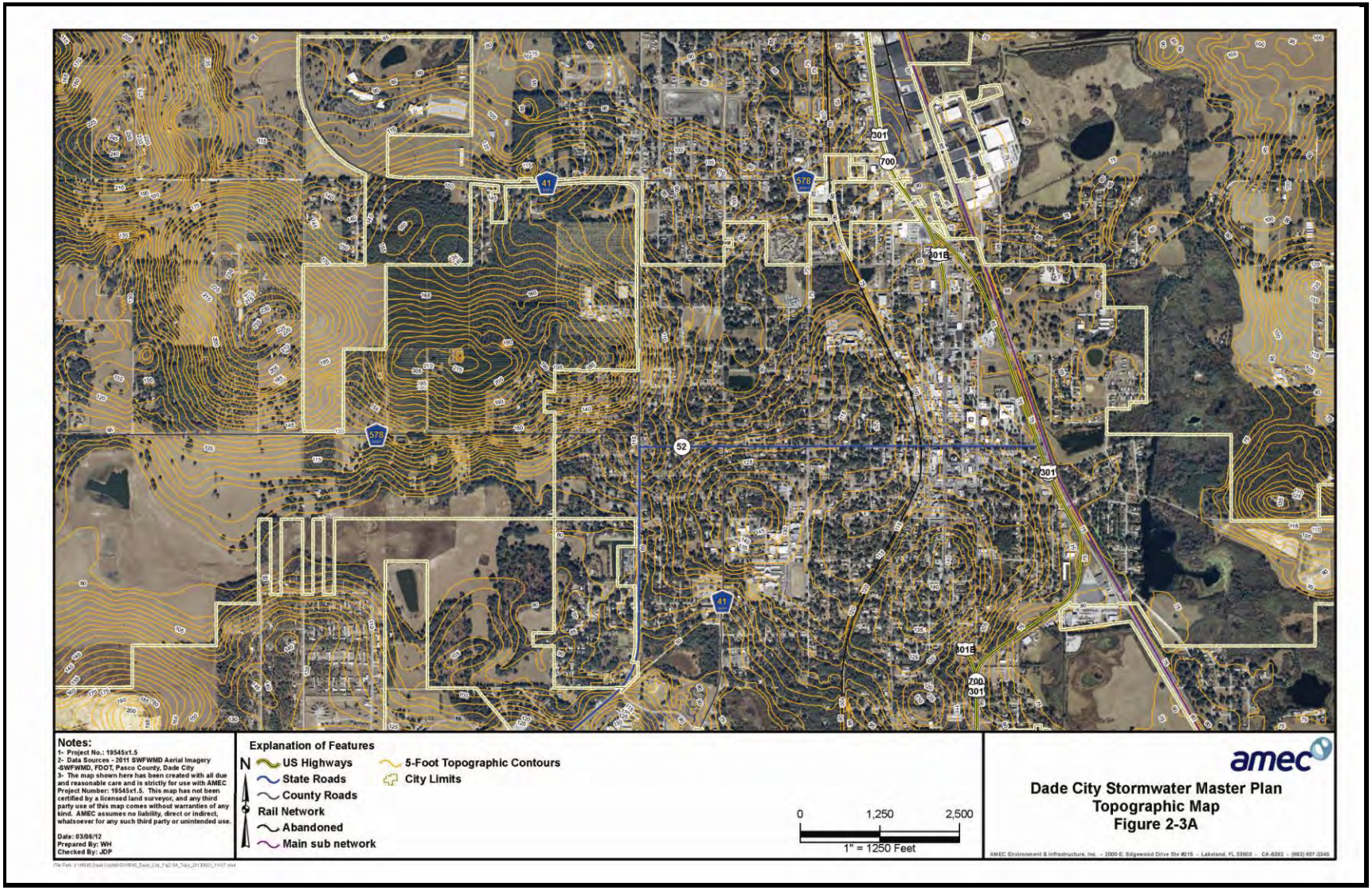
Checked By: JDP
Explanation of Features
N
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
5-Foot Topographic Contours
City Limits
0 0.25 0.5
1" = .5 Miles
amec
Dade City Stormwater Master Plan
Topographic Map
Figure 2-3
AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #216 - Lakeland, FL 33803 - CA #262 - (863) 667-2345


Notes:
1- Project No.: 19545x1.5
2- Data Sources - 2011 SWFWMD Aerial Imagery -SWFWMD, FDOT, Pasco County, Dade City
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Prepared By: WH
Checked By: JDP
Explanation of Features
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
5-Foot Topographic Contours
City Limits
N
0
1,250
2,500
1" = 1250 Feet
amec
Dade City Stormwater Master Plan
Topographic Map
Figure 2-3A

2.2 Climate

The climate of the Dade City area, and for Pasco County as a whole, can be classified as humid subtropical. Annual average precipitation is around 55 inches with approximately 60% of the total occurring during the four-month rainy season that extends roughly from June through September. This rainy season also coincides with the occurrence of most tropical storms and hurricanes. The majority of the rain events are the ubiquitous convective afternoon and evening thunderstorms that occur regularly during the summer months. Individual storms tend to be localized, and are characteristically highly variable in both intensity and volume. These regular events tend to be of high intensity and short duration that typically lead to short term flooding that abates several hours after the event. Larger, longer duration storms such as hurricanes or tropical depressions can produce much heavier volumes of stormwater that tend to produce floodwaters that remain for days to weeks after the events. Current permitting requirements and construction codes dictate that larger storm water structures and conveyances be installed for new construction, but much of the older infrastructure present throughout the City of Dade City simply cannot accommodate the large rates and volumes of stormwater produced by regular summer storm events – neither the less frequent tropical systems nor the typical daily thunderstorms.

Winter season rainfall occurs less frequently than during the summer season and is usually less intense than the events occurring in the summer months. Winter rainfall is usually the result of cold fronts passing through the area and not due to strong convective storms. Primarily during "El Nino" years, the region does occasionally see large rainfall events in the winter "dry season."

The annual mean temperature in Pasco County is approximately 72°F (Fahrenheit). The average high temperature varies from a low of approximately 71°F in January to a high of approximately 91°F from June through August. Temperatures can but rarely do exceed 100°F. The average low temperatures vary from 49°F in January to 72°F in August. Winter temperatures can fall into the teens on several occasions each winter. Humidity during the summer months is consistently above 90% and somewhat lower in the winter, but generally is high year-round. Estimates of evapo-transpiration rates vary widely but are generally taken to be between 40 to 56 inches per year.

2.3 Soils

Soil distribution is shown in both **Figures 2-4, and 2-5**. These data were developed based on Geographical Information Systems (GIS) coverages developed by SWFWMD. Many useful details and design considerations can be compiled from general knowledge of an area‟s soils and by consulting the USDA Soil Conservation Service‟s Pasco County Soils survey.

Soil types are divided by the Soil Conservation Service (SCS) into four primary Hydrologic Soil Groups (HSG) – A, B, C, and D - based on their runoff potential; the distribution of these types are shown in **Figure 2-5**. The hydrologic groups are utilized to reduce the dozens of distinct soil units into a smaller set of like soils that exhibit similar characteristics. The common characteristics of each HSG allow more accurate estimates of infiltration rates, moisture capacity, runoff generation and other general hydrologic properties of large areas without requiring site-specific soil borings and tests throughout the areas to be studied. For stormwater and drainage studies, the quantity of runoff that is generated during storm events is a crucial parameter. Various soil types and groups exhibit common and differing characteristics that greatly impact that quantity of runoff. Several of those characteristics are: depth to the seasonal high water level (SHWL), permeability and porosity of the soil reflecting grain size, slope of ground surface, and depth to a confining layer such as clay or hardpan that restricts the downward infiltration of storm water. The major soil hydrologic soil groups capture these parameters and are briefly described as:

- Group A soils have high infiltration rates and a correspondingly-low runoff potential rate when thoroughly wetted. They are typically deep, well-drained, large-grained sandy or gravelly soils with a high rate of water transmission. These soils typically have permeabilities on the order of 6 – 20 inches/hour and SHWL at six feet below grade or even deeper – meaning that groundwater does not reach near the ground surface and the soils maintain their infiltrative capacity during the entire year. Representative soils types found in the Dade City watershed that fall into this group include (among others): Adamsville (11), Candler fine sand (13, 14), Tavares (6, 15), and Lake (32).

- Group B soils have moderate infiltration rates and a slightly greater runoff potential rate when thoroughly wetted than Group A. They are typically moderately deep, moderately well-drained, and fine to coarse-grained sandy soils with a moderate rate of water transmission. These soils typically also have permeabilities on the order of 6 – 20 inches/hour but often include intermittent layers of less permeable soils that restrict the overall water transmission capability. SHWL can range from at the surface to several feet below grade. These higher groundwater levels restrict the infiltrative capacity during the wet season. Representative soils types found in the Dade City watershed that fall into this group include (among others): Kendrick fine sand (45, 62).

- Group C have low infiltration rates and a much greater runoff potential rate when thoroughly wetted than either Group A or Group B. They are typically fine-grained sandy soils and/or may have intermittent layers of clay, hardpan or other restrictive layers that greatly diminish the rate of water transmission. The sandy portions of these soils typically have permeabilities less than 5 inches/hour but the restrictive layers effectively minimize even this water transmission capability. SHWL can range from at the surface to several feet

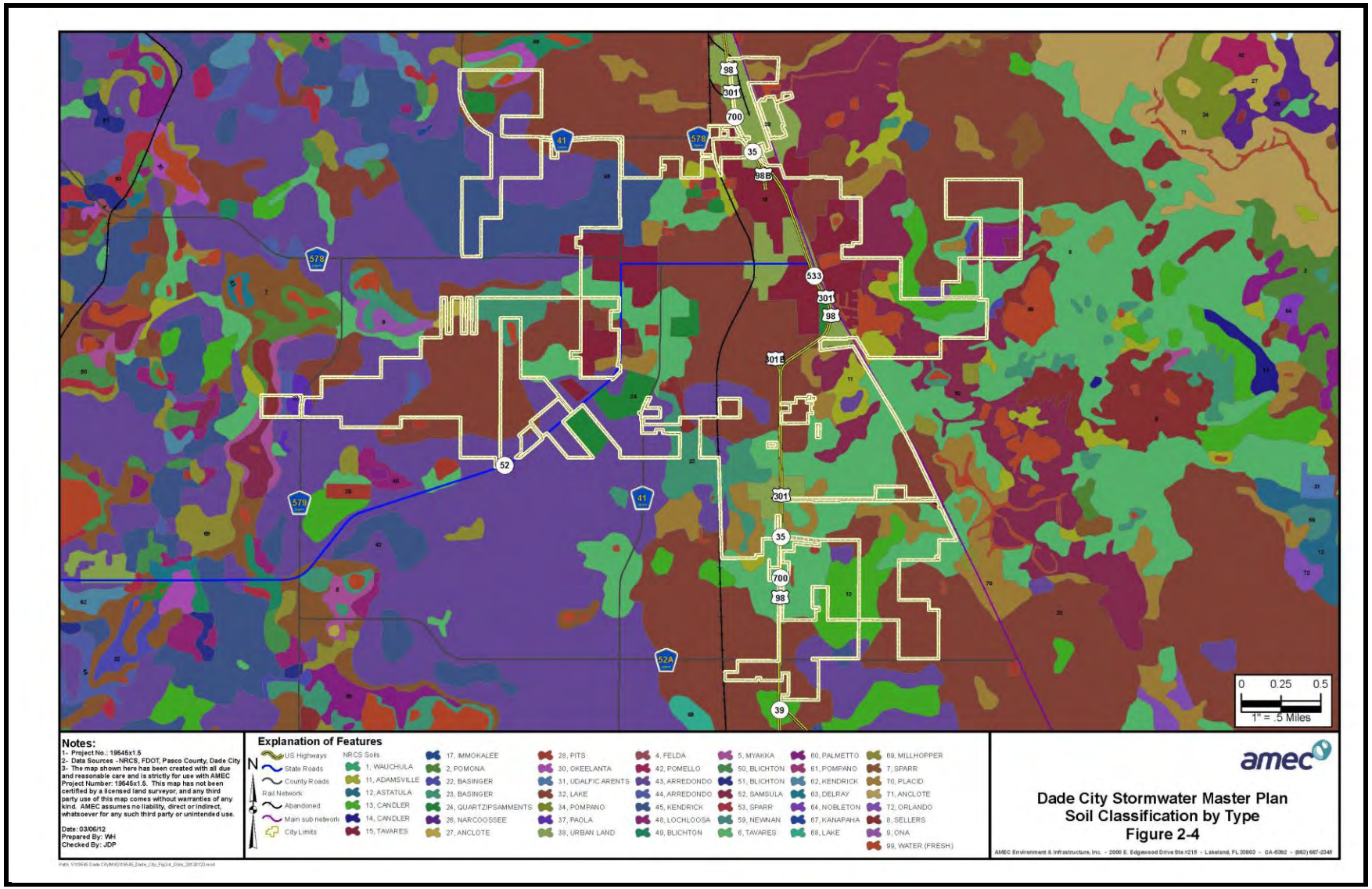
below grade. These higher groundwater levels restrict the infiltrative capacity during the wet season. Oddly enough, there are no HSG C soils found in the Dade City watershed that fall into this group.

- Group D soils have very slow infiltration rates and a much greater runoff potential rate when thoroughly wetted than the other groups. They are typically composed of clays or muck (soils with high concentrations of decaying and decayed organic materials that impede water flow); have high groundwater levels (even exceeding the ground surface); contain restrictive layers at or near the surface and generally present a very slow rate of water transmission. These soils typically have no realistic permeability due to restrictive layers and existing water levels. SHWL typically exceeds the ground surface for extended periods of time throughout the year.

Often soils are listed as "A/D", "B/D" or "C/D". These soils simply have characteristics of the two listed groups. The first group (A, B, or C) is how the soil would be described if it were improved, i.e. ditched or drained in some manor so that high groundwater levels were not a factor. The D symbolizes how the soil exists in its unimproved, natural condition. For hydrologic analysis, these soils are all treated as HSG D soils – to reflect their existing condition in the field. Soil types that fall within the A/D classification found in the Dade City watershed include: Basinger (23), Samsula (52), and Placid (70).

Urban Land (38) is simply a designation that regardless of the original soil type, the area is highly impervious due to development and as a result it is difficult to determine precisely what the natural soil might be and due to the high percentage of impervious surface the underlying soil type is of less importance. Quartzipsamments (24) is not assigned a true hydrologic soils group due to the highly disturbed nature of its mined soils.

Soil types can also be differentiated as either hydric or non-hydric. Hydric soils are typically high in organics, typically are mucks or contain mucks, are inundated below water level for regular intervals every year, typically occur within natural depressions and as a result are usually within wetlands. These soils are all HSG D or one of the dual groups – A/D, B/D, or C/D. Non-hydric soils are upland soils, are not regularly inundated, contain smaller amounts of organic material and typically are developed and exist in aerobic conditions.


Notes:
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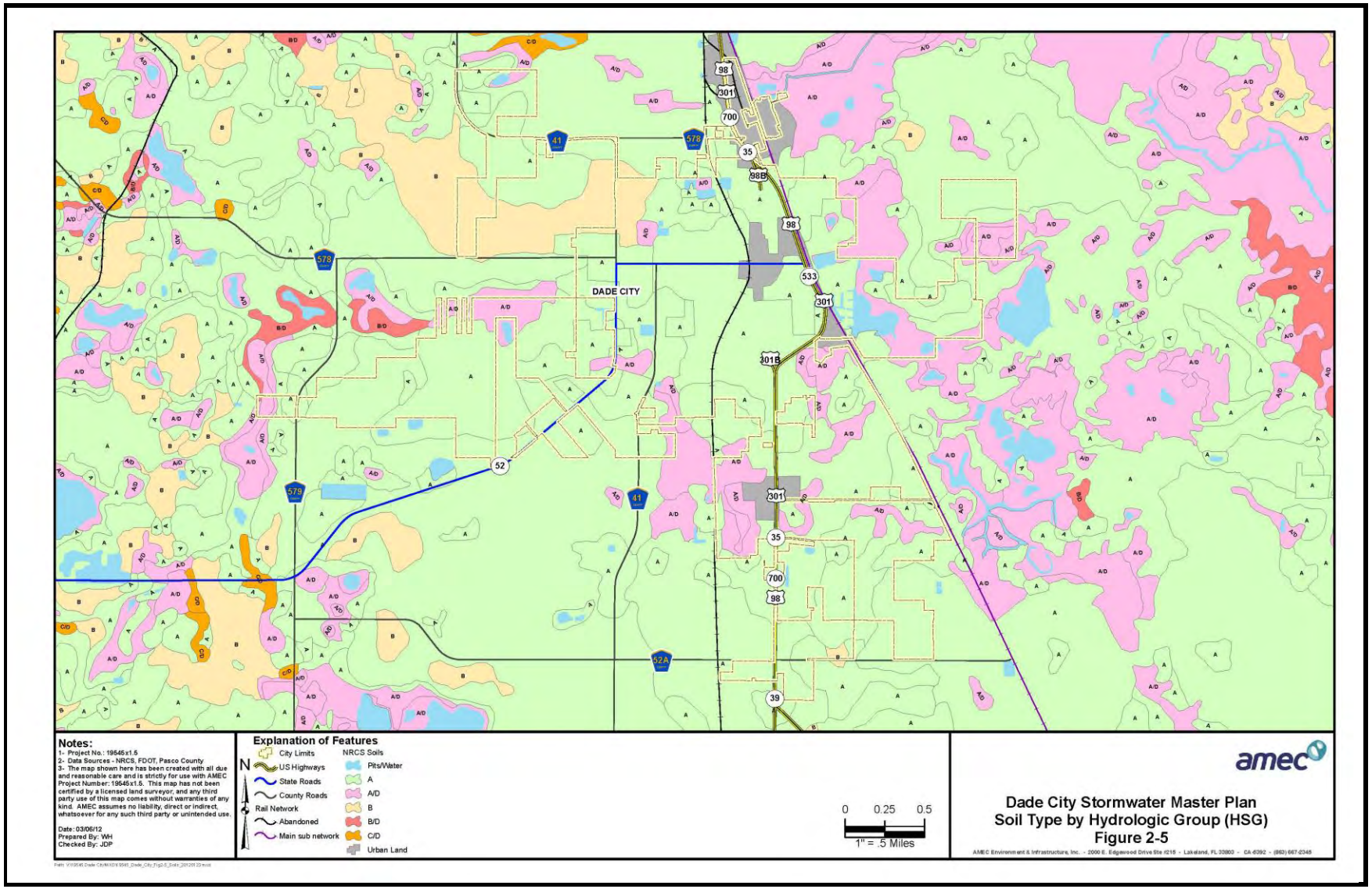
Date: 03/06/12
Prepared By: WH
Checked By: JDP
Explanation of Features
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
City Limits
NRCS Soils
1, WAUCHULA
11, ADAMSVILLE
12, ASTATULA
13, CANDLER
14, CANDLER
15, TAVARES
17, IMMOKALEE
2, POMONA
22, BASINGER
23, BASINGER
24, QUARTZIPSAMMENTS
26, NARCOOSSEE
27, ANCLOTE
28, PITS
30, OKEELANTA
31, UDALFIC ARENTS
32, LAKE
34, POMPANO
37, PAOLA
38, URBAN LAND
4, FELDA
42, POMELLO
43, ARREDONDO
44, ARREDONDO
45, KENDRICK
48, LOCHLOOSA
49, BLICHTON
5, MYAKKA
50, BLICHTON
51, BLICHTON
52, SAMSULA
53, SPARR
59, NEWNAN
6, TAVARES
60, PALMETTO
61, POMPANO
62, KENDRICK
63, DELRAY
64, NOBLETON
67, KANAPAHA
68, LAKE
69, MILLHOPPER
7, SPARR
70, PLACID
71, ANCLOTE
72, ORLANDO
8, SELLERS
9, ONA
99, WATER (FRESH)
0 0.25 0.5
1" = .5 Miles
amec
Dade City Stormwater Master Plan
Soil Classification by Type
Figure 2-4


DADE CITY
Notes:
1- Project No.: 19545x1.5
2- Data Sources - NRCS, FDOT, Pasco County
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Date: 03/06/12
Prepared By: WH
Checked By: JDP
Explanation of Features
City Limits
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
NRCS Soils
Pits/Water
A
A/D
B
B/D
C/D
Urban Land
N
0 0.25 0.5
1" = .5 Miles
amec
Dade City Stormwater Master Plan
Soil Type by Hydrologic Group (HSG)
Figure 2-5

2.4 Physiography and Hydrology

According to the SCS Soil Survey, the Dade City watershed lies within the Brooksville Ridge – an area characterized by shallow sands, intermittent sinkholes, widely varying elevations from elevation 75± feet along US Highway 301/98 in Dade City to as high as elevation 300 feet on Clay Hill located just northwest of Dade City. The underlying strata are primarily Miocene sands and clay that have eroded at different rates to produce the characteristic hills and closed basins common throughout the area. These elevation patterns are shown on **Figure 2-3**.

There is limited surface drainage from rainfall over undeveloped portions of the watershed and most of the flow is downward via infiltration. This infiltrated water can dissolve the underlying limestone and over time contributes to the undulating topography prevalent in the area. The surface flows that do exist are generally from the west to east toward the Green Swamp and the Withlacoochee River. The Green Swamp is a protected environmental system that provides the headwaters not only for the Withlacoochee River but also for the Hillsborough River and Palatlakaha River systems. Together, these two rivers are the dominant surface hydrologic features in this section of central Florida.

2.4.1 Watershed Sub-basins

The primary watershed studied under this Master Plan for the City can be divided into four main areas or sub-basins as shown in **Figure 2-2**. The majority of chronic flooding problems have been reported in the locations designated as Area 1 and Area 2; therefore the flood model was developed in these two areas only.

Area 1 is primarily the northern section of the city and contains many small closed drainage basins with no surface outfall but also includes large areas that ultimately drain easterly through multiple storm sewer conveyances to the existing lift station at the Cogen facility located on the east side of US Highway 98/301. From here the stormwater is pumped eastward to a wetland and ditched system referred to as the Dade City Canal and conveyed to the Withlacoochee River floodplain. Low lying portions of Area 1 are plagued by flooding which is experienced by residents via roadway flooding; yard flooding, and infrequent residential structure flooding. The area along 10th Street and north of Whitehouse Avenue is simply lower than the surrounding areas and so stormwater naturally collects and ponds in this location. Section 3.1 of the report describes the drainage in more detail.

Area 2 includes a densely developed portion of town and includes the highly impervious downtown area. The downtown area experiences frequent flooding due to the absence of a drainage conveyance system. Although the downtown area has seen an increase of imperviousness to over 80% or so, reliance on surface drainage has continued. The existing shallow roadway gutters easily flood from drainage from typical thunderstorm. The downtown area is discussed in more detail in Section 3.2 in the report. The proposed improvements to the downtown drainage system have already been submitted to the

Southwest Florida Water Management District (SWFWMD) and the Florida Department of Transportation (FDOT) for permitting.

Area 3 is the southwestern portion of the City and generally is bordered by St. Joe Road (CR 578) on the north, 10th Street on the east, Pasco High School complex on the south and The Pines subdivision on the west. This area is part of the larger Tank Lake Drainage Basin of Special Concern designated by the City in 2008 for special stormwater criteria. This sub-basin has several low lying areas that are "closed basins" or areas that are flood prone due to the lack of a surface discharge. Drainage from residential and commercial areas on the north side of Highway 52 collects in a low area located north of John Burks Memorial Park complex. Stormwater runoff from areas located east of Fort King Road collect in low lying areas inclusive of "Hester Lake" and "Tank Lake". During extreme flood conditions, these two flood prone areas are connected at the confluence of Fort King Road, Old Saint Ann Road and Highway 52. There have been instances of flooding within this area although no specific structure flooding was reported during the preparation of this Master Plan.

Area 4 is located in the east central portion of town and includes the intersection of 7th Street and US 98 Bypass and the intersection of Old Lakeland Highway and US 98 Bypass. Surface water runoff from residential areas on the north side sheetflows to the south and east under US 98 Bypass into low lying flood prone areas. Drainage from these low areas discharge easterly under Old Lakeland Highway and flow to the north toward the Withlacoochee River floodplain. No structure flooding was noted for this area by City staff during the course of the Master Plan development.

2.5 Existing and Future Land Use

Land use information was gathered from two primary sources. The existing land use was determined by using 2009 Southwest Florida Water Management District and Pasco County Comprehensive Plan information. The future land use information was acquired from the Pasco County Comprehensive Plan. Please note that the acreages in the two coverage‟s are slightly different as the future land use information reflects the up-to-date limits of 3920.94 acres while the existing land use data has not been completely updated and therefore the acreages refer primarily to the 3828 acres that comprise the city limits when those data were compiled in 2009.

2.5.1 Existing Land Use

Dade City contains a diversity of land use types but consists primarily of low and medium density residential (1148 acres), agricultural (1042 acres), wetlands (361 acres), commercial (294 acres) and institutional (248 acres) land uses. The Southwest Florida Water Management District‟s 2009 Land Use/Land Cover Map is shown in **Figure 2-6**. Additional existing land use information provided by the County‟s Property Appraiser‟s Office is illustrated in **Figure 2-7**. The most intensely developed land uses are in the east

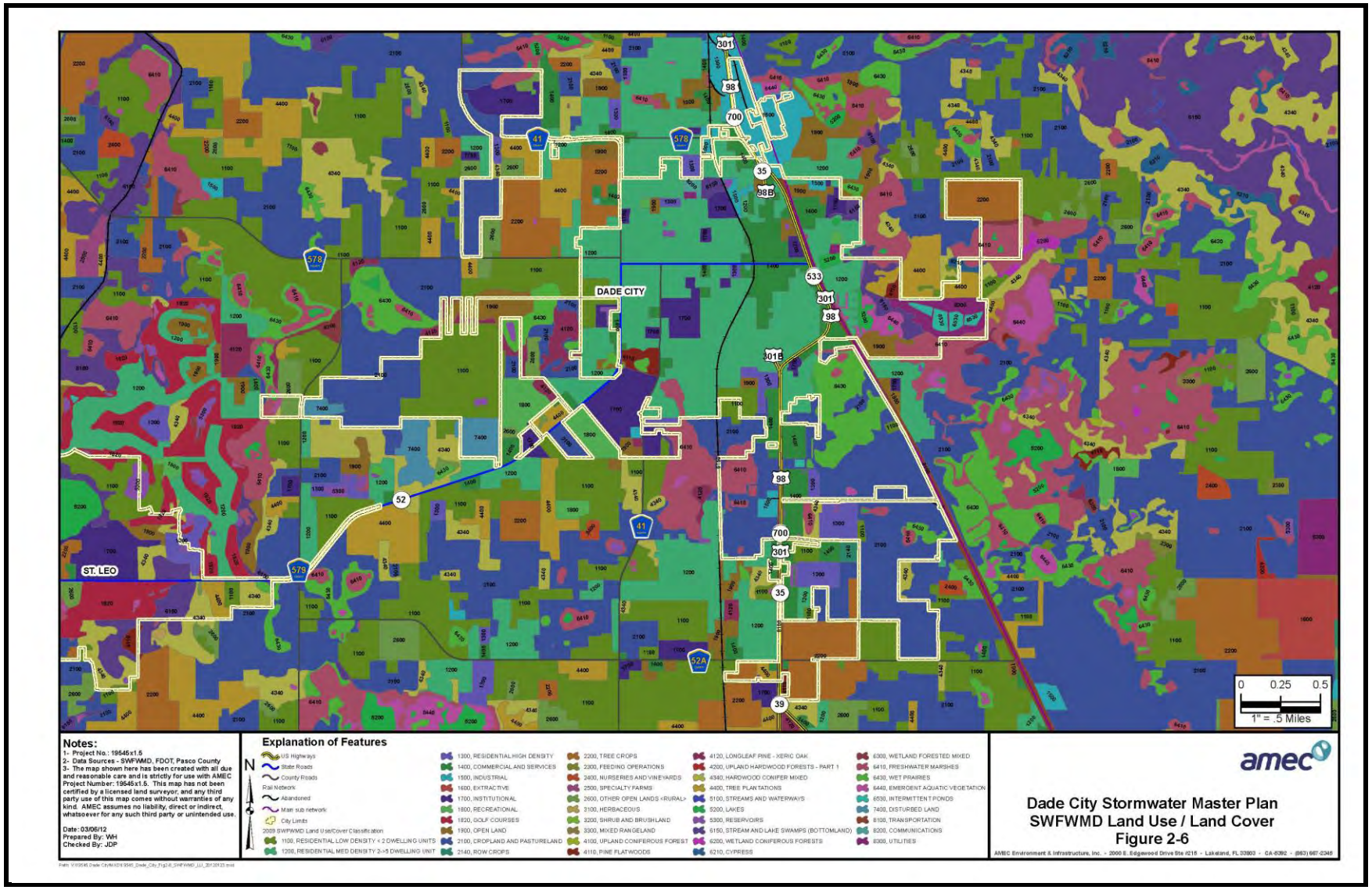
central portion of the city around the main thoroughfare – US Highway 98/301 and the adjacent CSX railroad facility.

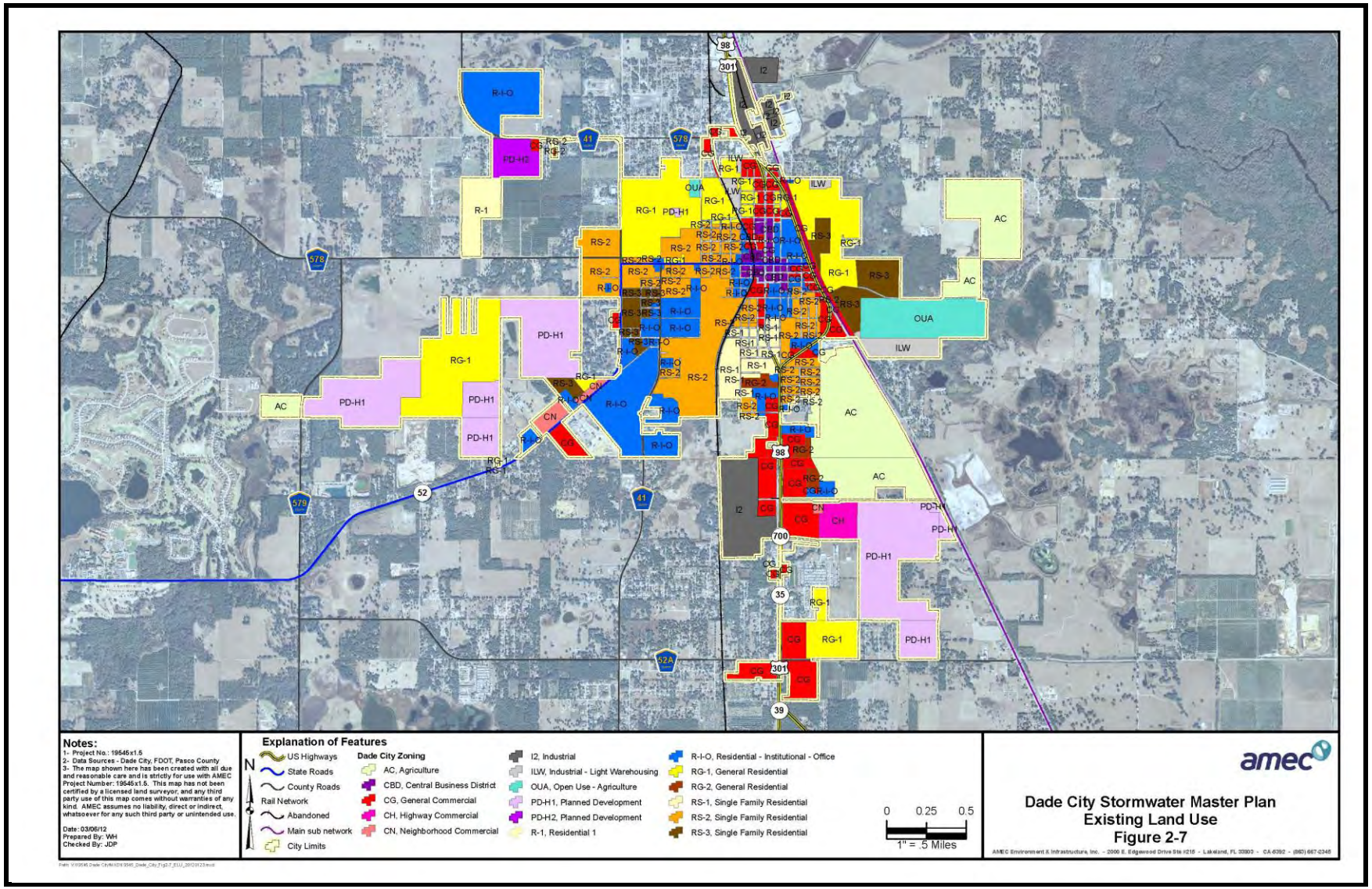
The majority of the developed areas – commercial, industrial and residential - tend to be older construction and as such have little or no stormwater treatment or attenuation provided since state stormwater regulations were not in force until the early 1980"s. Many of the drainage problems have developed over the years as development reduced the available pervious surface area for stormwater to infiltrate into the ground and simultaneously increased the volume of stormwater produced from the basin area. The stormwater subsequently drained overland or through undersized storm sewers, conveyances and pumping systems that were not designed to handle the current level of stormwater volumes and rates generated from their contributing drainage areas. As shown in **Figure 2-8**, there are several Master Planned Unit Developments in the general area of the County – but none within the study area for the City.

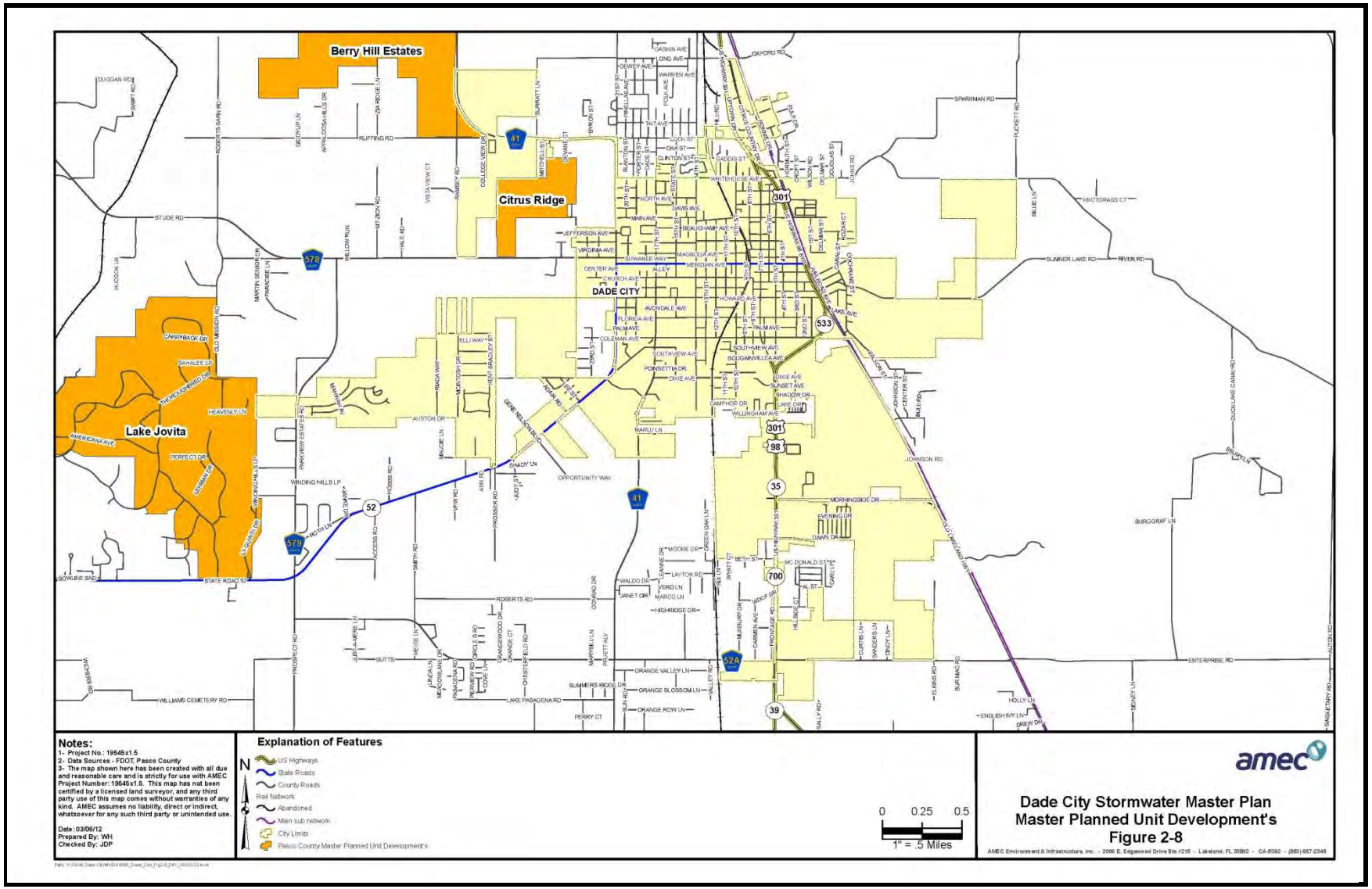
Table 2.1 indicates that of the 3,920+ acres in the watershed within the city limits, approximately 2,012+ acres or 51.3% of the watershed has been developed, another 1,196+/- acres or 30.5% are agricultural, open or recreational, and the remaining 712 +/- acres are either natural areas or water/wetlands or unaccounted for in the existing land use code.

Table 2.1
Existing Land Uses – Dade City Area Watershed
(Based on 2009 Southwest Florida Water Management District Information)

Land Use Category	Total Acreage	Percent of Total
Low / Medium Density Residential	1147.80	29.28
High Density Residential	83.43	2.13
Industrial	104.33	2.66
Agricultural	1042.29	26.58
Commercial	294.39	7.51
Institutional	248.49	6.34
Highway / Utility	133.65	3.41
Recreational	8.84	0.22
Open Land	145.15	3.70
Extractive (Mining) / Disturbed	55.27	1.41
Upland Forested	88.69	2.26
Wetland Forested	9.1	0.23
Wetland Non-Forested	352.14	8.98
Water	115.33	2.94
Undetermined	92.04	2.35
TOTAL	**3920.94**	**100.00**


DADE CITY
ST. LEO
0 0.25 0.5
1" = .5 Miles
Notes:
1- Project No.: 19545x1.5
2- Data Sources - SWFWMD, FDOT, Pasco County
3- The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number: 19545x1.5. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.
Date: 03/06/12
Prepared By: WH
Checked By: JDP
Explanation of Features
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
City Limits
2009 SWFWMD Land Use/Cover Classification
1100, RESIDENTIAL,LOW DENSITY < 2 DWELLING UNITS
1200, RESIDENTIAL,MED DENSITY 2->5 DWELLING UNIT
1300, RESIDENTIAL,HIGH DENSITY
1400, COMMERCIAL AND SERVICES
1500, INDUSTRIAL
1600, EXTRACTIVE
1700, INSTITUTIONAL
1800, RECREATIONAL
1820, GOLF COURSES
1900, OPEN LAND
2100, CROPLAND AND PASTURELAND
2140, ROW CROPS
2200, TREE CROPS
2300, FEEDING OPERATIONS
2400, NURSERIES AND VINEYARDS
2500, SPECIALTY FARMS
2600, OTHER OPEN LANDS <RURAL>
3100, HERBACEOUS
3200, SHRUB AND BRUSHLAND
3300, MIXED RANGELAND
4100, UPLAND CONIFEROUS FOREST
4110, PINE FLATWOODS
4120, LONGLEAF PINE - XERIC OAK
4200, UPLAND HARDWOOD FORESTS - PART 1
4340, HARDWOOD CONIFER MIXED
4400, TREE PLANTATIONS
5100, STREAMS AND WATERWAYS
5200, LAKES
5300, RESERVOIRS
6150, STREAM AND LAKE SWAMPS (BOTTOMLAND)
6200, WETLAND CONIFEROUS FORESTS
6210, CYPRESS
6300, WETLAND FORESTED MIXED
6410, FRESHWATER MARSHES
6430, WET PRAIRIES
6440, EMERGENT AQUATIC VEGETATION
6530, INTERMITTENT PONDS
7400, DISTURBED LAND
8100, TRANSPORTATION
8200, COMMUNICATIONS
8300, UTILITIES
amec
Dade City Stormwater Master Plan
SWFWMD Land Use / Land Cover
Figure 2-6
AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #216 - Lakeland, FL 33803 - CA-6362 - (863) 667-2345


Notes:
1- Project No.: 19545x1.5
2- Data Sources - Dade City, FDOT, Pasco County
3- The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number: 19545x1.5. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.
Date: 03/06/12
Prepared By: WH
Checked By: JDP
Explanation of Features
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
City Limits
Dade City Zoning
AC, Agriculture
CBD, Central Business District
CG, General Commercial
CH, Highway Commercial
CN, Neighborhood Commercial
I2, Industrial
ILW, Industrial - Light Warehousing
OUA, Open Use - Agriculture
PD-H1, Planned Development
PD-H2, Planned Development
R-1, Residential 1
R-I-O, Residential - Institutional - Office
RG-1, General Residential
RG-2, General Residential
RS-1, Single Family Residential
RS-2, Single Family Residential
RS-3, Single Family Residential
N
0 0.25 0.5
1" = .5 Miles
amec
Dade City Stormwater Master Plan
Existing Land Use
Figure 2-7
AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-6392 - (863) 667-2345

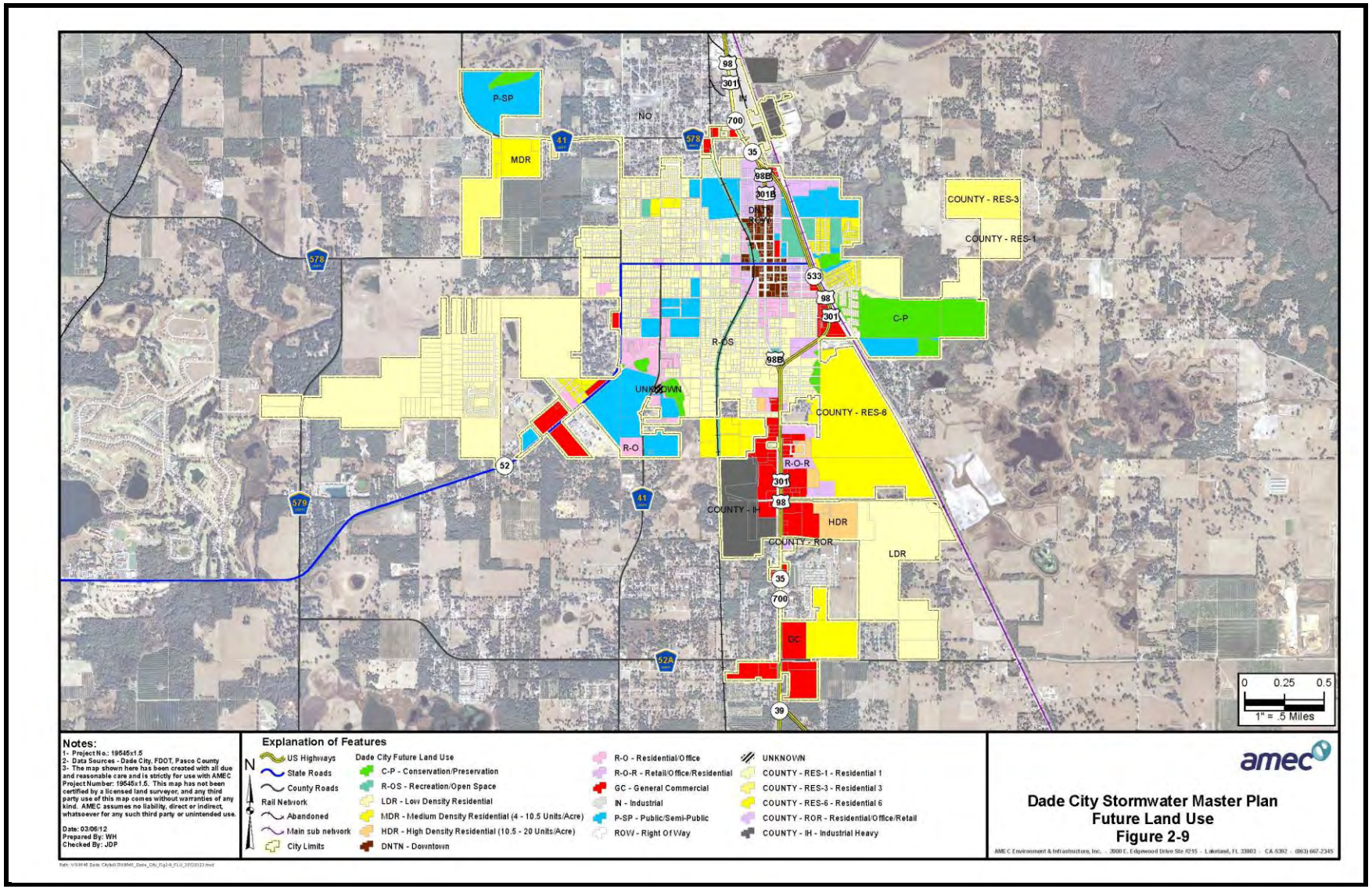

Berry Hill Estates
Citrus Ridge
DADE CITY
Lake Jovita
Notes:
1- Project No.: 19545x1.5
2- Data Sources - FDOT, Pasco County
3- The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number: 19545x1.5. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.
Date: 03/06/12
Prepared By: WH
Checked By: JDP
Explanation of Features
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
City Limits
Pasco County Master Planned Unit Development's
N
0 0.25 0.5
1" = .5 Miles
amec
Dade City Stormwater Master Plan
Master Planned Unit Development's
Figure 2-8
AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-8392 - (863) 667-2345

2.5.2 Future Land Uses

Figure 2-9 shows the projected future land use map according to the Pasco County Comprehensive Plan. Due to the highly developed nature of the City watershed, not many significant changes in land use are predicted. The majority of predicted changes will be associated with the agricultural and open land areas and will most likely change over to a mixed urban use of residential and light commercial land uses. The names of the various categories have been changed and standardized but the general land uses have not been significantly changed (see **Table 2.2**).

Table 2.2
Future Land Uses – Dade City Area Watershed
(Based on Pasco County Comprehensive Plan Information)

Land Use Category	Total Acreage	Percent of Total
Residential 1	89.38	2.28
Residential 3	132.84	3.39
Residential 6	410.64	10.47
Residential/Office	116.16	2.96
Retail/Office/Residential	110.80	2.83
Light Industrial	41.07	1.05
Heavy Industrial	149.87	3.82
Public/Semi-Public	369.10	9.41
Residential/Office/Retail	7.84	0.20
General Commercial	265.92	6.78
High-density Residential	57.36	1.46
Low-density Residential	1382.79	35.28
Medium-density Residential	107.77	2.75
Downtown	46.19	1.18
Right of Way	384.14	9.80
Major Recreation and Open Space	63.66	1.62
Conservation/Preservation	183.28	4.67
Unknown	2.14	0.05
TOTAL	**3920.94**	**100.0**


P-SP
MDR
NO
IN
DNTN
COUNTY - RES-3
COUNTY - RES-1
C-P
R-OS
UNKNOWN
COUNTY - RES-6
R-O
R-O-R
COUNTY - IH
HDR
COUNTY - ROR
LDR
GC
0 0.25 0.5
1" = .5 Miles
Notes:
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Date: 03/06/12
Prepared By: WH
Checked By: JDP
Explanation of Features
US Highways
State Roads
County Roads
Rail Network
Abandoned
Main sub network
City Limits
Dade City Future Land Use
C-P - Conservation/Preservation
R-OS - Recreation/Open Space
LDR - Low Density Residential
MDR - Medium Density Residential (4 - 10.5 Units/Acre)
HDR - High Density Residential (10.5 - 20 Units/Acre)
DNTN - Downtown
R-O - Residential/Office
R-O-R - Retail/Office/Residential
GC - General Commercial
IN - Industrial
P-SP - Public/Semi-Public
ROW - Right Of Way
UNKNOWN
COUNTY - RES-1 - Residential 1
COUNTY - RES-3 - Residential 3
COUNTY - RES-6 - Residential 6
COUNTY - ROR - Residential/Office/Retail
COUNTY - IH - Industrial Heavy
amec
Dade City Stormwater Master Plan
Future Land Use
Figure 2-9