MARION COUNTY
MASTER WASTEWATER FEASIBILITY REPORT

Marion County | September 2021

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Prepared for

Marion County

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ADF	Average Daily Flow
ANSI	American National Standards Institute
ATU	Aerobic Treatment Unit
AWT	Advanced Water Treatment
BEBR	Bureau of Economic and Business Research
BMAP	Basin Management Action Plan
CBP	Concrete Batch Plant
$CBOD_5$	Five-Day Carbonaceous Biochemical Oxygen Demand
CDD	Community Development District
cfs	Cubic Feet per Second
CIP	Capital Improvement Plan
CRA	Community Redevelopment Area
DMR	Discharge Monitoring Report
DOR	Department of Revenue
DW	Domestic Waste
E{A	US Environmental Protection Agency
ERC	Equivalent Residential Connection
ERU	Equivalent Residential Unit
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FGUA	Florida Governmental Utility Authority
FLWMI	Florida Water Management Inventory
FM	Force Main
fps	Feet per second
GIS	Geographic Information System
GPCD	Gallons per Capita per Day
gpd	Gallons per Day
GPM	Gallons per Minute
IW	Industrial Waste
LDC	Land Development Codes
LF	Linear Feet
LS	Lift Station
MCUD	Marion County Utilities Department
MFL	Minimum Flows and Levels
mg/L	Milligrams per Liter
MGD	Million Gallons per Day

Acronym	Definition
MP	Master Plan
MPR	Master Plan Report
NSF	National Science Foundation
NSILT	Nitrogen Source Inventory and Loading Tool
O&M	Operation and Maintenance
OSTDS	Onsite Sewage Treatment and Disposal System
PBTS	Performance-Based Treatment System
PFA	Priority Focus Area
PHF	Peak Hourly Flow
POR	Period of Record
PPA	Priority Project Area
PPH	Persons per Household
RAF	Residual Application Facility
RCW	Reclaimed Water
RES	Residuals/Septage Management Facility
RIB	Rapid Infiltration Basin
S2S	Septic to Sewer
SCADA	Supervisory Control and Data Acquisition
SJRWMD	St. Johns River Water Management District
STEP	Septic Tank Effluent Pumped
STPO	Septic Tank Phase-Out
SWFWMD	Southwest Florida Water Management District
TMADF	Three-Month Average Daily Flow
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UFA	Upper Floridan Aquifer
USGS	US Geological Survey
WEC	World Equestrian Center
WRF	Water Reclamation Facility
WWTF	Wastewater Treatment Facility

EXECUTIVE SUMMARY

In 2016, the Florida Legislature passed the Florida Springs and Aquifer Protection Act. The new legislation identified 30 "outstanding Florida springs" – 24 historic first magnitude springs and six additional named springs. Of the 30 listed springs, 24 have been determined to be impaired for the nitrate form of nitrogen. The Florida Department of Environmental Protection (FDEP) was charged with developing basin management action plans (BMAPs) to identify the source of nitrogen impairment and recommend actions to mitigate the problem. In cases where 20 percent or more of the nitrogen loading is from on-site treatment and disposal systems (OSTDS), also known as septic systems, or as otherwise designated by FDEP, the development of an OSTDS remediation plan is required.

Two outstanding Florida spring systems are in Marion County – the Silver Springs and Silver Springs Group and the Rainbow Springs Group and Rainbow Springs Group Run – both of which are impaired for nitrogen. BMAPs were finalized for each spring system in 2015 to address the nutrient loading and required reductions, and the individual BMAPs were combined in 2018. The percentage of nitrogen loading from OSTDS in Silver and Rainbow is 29 percent and 20 percent respectively; therefore, an OSTDS remediation plan is required.

Marion County is one of nine counties to receive grant funding from FDEP to develop the OSTDS remediation plan. The Marion County Master Wastewater Feasibility Report is the result of that grant funding and contains the key elements mandated by state statute: septic system inventory, wastewater capacity and infrastructure assessment, necessary infrastructure upgrades determination, and cost-effective project solutions and financing options evaluation to fund selected projects. The overarching goal of the Report is to evaluate existing septic systems and wastewater infrastructure and develop a plan to meet the nutrient reduction goal for septic systems over the 20-year BMAP timeframe. The Report is intended to be a living and dynamic document. As changes occur over the life of the BMAP, changes may be made to this document that reflect the current conditions in Marion County.

To develop the plan to meet the nutrient reduction goal, existing septic systems were inventoried county-wide. From these data, 133 discrete priority project areas (PPAs) were selected for further evaluation based on parcel density, OSTDS density, known subdivision, proximity to springs, proximity to existing utility infrastructure, and anticipated growth. Cost estimates were developed for each PPA, which included septic tank abandonment, construction of a gravity sewer collection system and transmission system (including lift stations), and in some cases, grinder pumps. In total, implementation of septic to sewer (S2S) projects in all 133 PPAs would cost approximately $4.1 billion; over a 20-year planning period, making this level of improvement is a significant undertaking and likely infeasible due to cost.

The County's existing sewer collection and transmission system was evaluated, and a calibrated extended period simulation (EPS) hydraulic model was developed to predict system growth and infrastructure needs throughout the County's collection and transmission systems. Weighted formulas were developed to prioritize PPAs for S2S conversion based on total nitrogen load reduction, proximity to infrastructure, lot size and density, distance from springs, and whether they were inside the BMAP and/or Priority Focus Area (PFA) boundary.

Extensive public outreach was also conducted, which reflected the concern that the residents of Marion County have regarding the financial implications of the transition from septic to centralized sewer or the requirements to upgrade to an advanced unit if centralized sewer is not available. Meetings were conducted with other in-County utility stakeholders, local special interest groups, and members of the public; in total, over one dozen meetings were held to gauge public sentiments and to educate County citizens.

Once PPAs were selected and prioritized, a detailed financial model was developed for the County and a financial analysis was performed to evaluate funding options for S2S projects. Various assumptions were made, including that projects would be funded by at least 50% grant funding and some form of mandatory connection would need to be in place. Other funding mechanisms were assessed, from Countywide to parcel-specific, and a special workshop was held with the Board of County Commissioners to discuss the results and financial implications of the study. The Board directed County staff to pursue a small-scale centralized sewer project in one of the prioritized PPAs before a larger scale effort is undertaken.

Overall, a Countywide analysis was conducted to identify septic systems, select and prioritize project areas, educate and engage the public, and evaluate funding opportunities. Five PPAs were recommended for further investigation, along with other improvements to existing wastewater collection and transmission infrastructure. A matrix of funding opportunities was presented to the Board; based on Staff's recommendation, the Board motioned to accept the PPA prioritization and move forward with a pilot project. This Report details the project efforts and presents a Capital Improvement Plan to address the requirements of the State-mandated OSTDS remediation plan and help Marion County protect and preserve its beautiful springs.

1 INTRODUCTION

1.1 OVERVIEW

Marion County was an early adopter of springs protection, implementing a Springs Protection Program that includes Springs Protection Overlay Zones, restrictions, setbacks and special-use standards for critical land uses, policies and standards for new development, and remediation and research projects. The County adopted a detailed Springs Protection Ordinance in 2009, the requirements of which have been deployed throughout the County's Land Development Codes (LDCs).

Silver Springs and the Rainbow Springs Group, in central and southwest Marion County, respectively, are two of the largest freshwater spring formations in the world. Both springs groups are part of the 30 Outstanding Florida Springs established in 2016 by the Florida Legislature. Under the 2016 Florida Springs and Aquifer Protection Act, the Florida Department of Environmental Protection (FDEP) must adopt septic system remediation plans for Outstanding Florida Springs where FDEP has determined that an upgrade or the elimination of septic systems is necessary to achieve nutrient water-quality objectives. After engagement with other stakeholders, FDEP has adopted basin management action plans (BMAPs) that require development of master wastewater treatment analyses to establish the specific strategies for implementation.

The *Silver Springs and Upper Silver River and the Rainbow Springs Group and Rainbow River BMAP* water-quality restoration goal for the nitrate form of nitrogen (Nitrate-N) is 0.35 milligram per liter (mg/L). As part of the 2016 legislation, an Onsite Sewage Treatment and Disposal System (OSTDS) Remediation Plan, including an upgrade or elimination of septic systems, was required for this BMAP because the nitrogen loading to groundwater from OSTDSs was identified to be 29 percent for the Silver Springs and Upper Silver River BMAP area and 20 percent for the Rainbow Springs Group and Rainbow River BMAP area. This Master Wastewater Feasibility Report is a grant-funded project intended to develop an effective septic system remediation plan. Key elements of the Report are a septic system inventory, wastewater capacity and infrastructure assessment, necessary infrastructure upgrades determination, and cost-effective project solutions and financing options evaluation to fund selected projects.

1.2 PURPOSE

Silver Springs and the Rainbow Springs Group are first-magnitude Outstanding Florida Springs that FDEP has assessed as impaired for Nitrate-N. The BMAP areas share a boundary running north-south along Interstate 75 (I-75). The Silver Springs and Upper Silver River (Silver Springs) BMAP area is east of I-75, and the Rainbow Springs Group and Rainbow River (Rainbow Springs Group) BMAP area is west of I-75. The boundary also coincides with the north-south boundary between the St. Johns River Water Management District (SJRWMD) and the Southwest Florida Water Management District (SWFWMD).

The Silver Springs BMAP area is mostly in central Marion County, with portions extending into Alachua and Putnam Counties, and encompasses all or portions of several municipalities in Marion, Alachua, Sumter, and Lake Counties, including the City of Ocala, City of Belleview, City of Hawthorne, Town of McIntosh, City of Fruitland Park, Town of Lady Lake,

City of Wildwood, and The Villages Community Development Districts (CDDs). The Ocala National Forest is along the east border of the BMAP area. The waterbodies delineated as Silver Springs and the Silver Springs Group, located approximately 6 miles northeast of downtown Ocala, are collectively referred to as Silver Springs and together include at least 30 named springs that contribute flow to the Upper Silver River.

Three segments of the Silver River are considered impaired for Nitrate-N. The first is Silver Springs, the uppermost portion of the Silver River, which contains the largest spring in the system – Silver Main Spring, also known as Mammoth Spring. This spring consists of two caverns or vents and on average produces approximately 45 percent of the flow in the Silver River. Historically, Silver Main Spring is the largest nontidal spring in Florida by volume and is believed to be the largest first-magnitude spring in the United States. The second impaired segment is the Silver Springs Group, the portion of the river downstream of Silver Main Spring that contains at least three major springs, 26 additional named springs, and many smaller unnamed springs. This cluster of springs contributes most of the flow to the Silver River, which flows east approximately 5 miles to the Ocklawaha River. The third impaired segment, the Upper Silver River, is the 1.7-mile stretch downstream of the Silver Springs Group. This section has no named springs.

The Rainbow Springs Group BMAP area is mostly in west Marion County, with portions extending into Levy County. Major urban centers include west Ocala, Dunnellon, Williston, Bronson, and the Bay Laurel Center CDD (On Top of the World). The Rainbow Springs Group BMAP area includes the Rainbow Springs Group, the Rainbow Springs Group Run, and the Rainbow River together with the groundwater contributing area for the springs. Located approximately 20 miles southwest of downtown Ocala, the waterbody delineated as the Rainbow Springs Group contains at least 11 named springs. The Rainbow Springs Group Run (Upper Rainbow River) also receives additional spring discharges, including those from two major springs. Together they are referred to as the Rainbow Springs Group and the Rainbow River.

Two segments of the Rainbow River are considered impaired for Nitrate-N. The first is the Rainbow Springs Group, the uppermost portion of the Rainbow River, which contains two large springs and numerous smaller springs and seeps. The primary spring, Rainbow Springs #1, comprises multiple irregular fractures within the limestone of the designated swimming area in the Rainbow Springs State Park. The second largest spring, Rainbow Springs #4, is approximately 50 feet downstream of the swimming area, flowing from beneath a limestone ledge approximately 10 feet below the surface. These two springs, together with the many other springs discharging from limestone cracks and sand boils, make up the fourth largest spring group in Florida. The second impaired segment, the Rainbow Springs Group Run, is the segment of the river downstream of the Rainbow Springs Group. The run contains two large springs, Rainbow Springs #6 and Bubbling Spring, which are approximately 0.4 mile from the head of the river and approximately 200 feet downstream of Rainbow Springs #4, respectively.

FDEP adopted a nutrient Total Maximum Daily Load (TMDL) for the Silver Springs, Silver Springs Group, and Upper Silver River in 2012 and for the Rainbow Springs Group and Rainbow Springs Group Run in 2013. These spring-related waters were determined to be impaired for nutrients based on consistent Nitrate-N concentrations over 0.6 mg/L and evidence of an imbalance of flora and fauna caused by algal smothering. Based on the

TMDL, FDEP developed and adopted a BMAP for the Silver Springs, Silver Springs Group, and Upper Silver River in October 2015 and a BMAP for the Rainbow Springs Group and Rainbow Springs Group Run in December 2015. The Silver Springs and Rainbow Springs Group BMAPs were combined in 2018, proposing a comprehensive set of strategies to achieve the required pollutant-load reduction. The combined BMAP includes the designation of Priority Focus Areas (PFAs), areas of the basin identified as most vulnerable to pollutant loading. Figure 1-1 presents the Silver Springs, the Rainbow Springs Group, and associated BMAP areas and PFAs.

The Silver Springs and Rainbow Springs Group BMAP areas extend outside Marion County. The portion of the BMAPs within Marion County include over 95 percent of the residential and commercial population of Marion County – approximately 220,000 people in the Silver Springs BMAP area and approximately 90,000 people in the Rainbow Springs Group BMAP area. Within the Rainbow Springs Group PFA, central sewer collection is provided to a small service area by the Florida Governmental Utility Authority (FGUA). Within the Silver Springs PFA, central sewer collection is provided in some areas by the Cities of Ocala and Belleview and by the Marion County Utilities Department (MCUD). However, Marion County has the second-highest number of septic systems in Florida. To avoid additional damage to the springs created by the dense use of septic systems, the County is evaluating options via this report for removing septic systems, providing additional centralized sewer collection with centralized treatment, and identifying enhanced on-site septic treatment options.

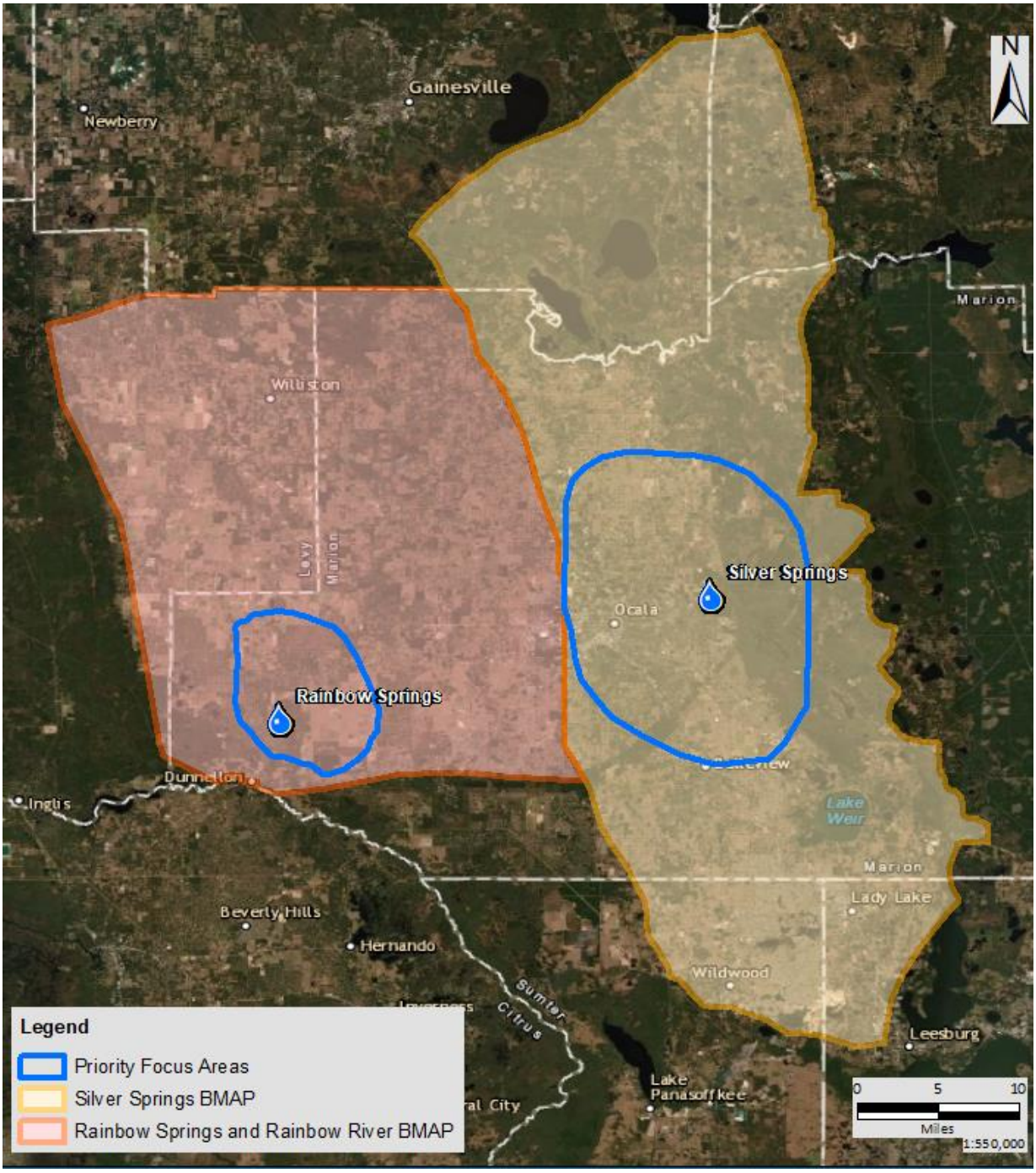
The water quality in Silver Springs, the Rainbow Springs Group, and the Upper Floridan Aquifer (UFA) has a significant impact on the community. The UFA is the primary drinking water source in this area. The springs and associated rivers provide recreational and aesthetic benefits to residents and visitors, economic opportunities, and essential habitat for fish and other wildlife. This Report is part of an effort to improve and protect this crucial natural resource, which impacts ecosystems, fisheries, marine and wildlife habitats, wetlands, tourism, home values, drinking water quality, and overall quality of life.

1.3 Background

The Silver Springs BMAP and the Rainbow Springs Group BMAP were individually adopted in 2015; in 2018, FDEP replaced those two plans with a single BMAP. This update was made to address the requirements of the Florida Springs and Aquifer Protection Act more efficiently, since no clear delineation exists between the zones of influence of the two spring systems, management policies are largely the same for both areas, and Marion County has the largest land area within both BMAP areas – 60 percent of Silver Springs and 65 percent of the Rainbow Springs Group. However, for the calculation of nutrient loading and the identification of nutrient sources, two distinct BMAP areas are referenced and mapped.

The 2018 BMAP was challenged in 2019. The challenge was resolved in February 2021 and a Final Order summarizing the result of the challenge was published by FDEP in May 2021. Based on the Final Order, the BMAP's new effective date is May 2021.

Figure 1-1 Silver Springs and Rainbow Springs Group BMAP Areas and PFAs



1.3.1 Silver Springs and Upper Silver River

The Upper Silver River and its headwater springs are wholly within the Silver Springs State Park; the Silver River is also entirely within the Ocklawaha River Aquatic Preserve. In 1985, the State of Florida purchased the land surrounding Silver Springs, acquiring the actual springs in 1993. However, the springs were privately managed for another 20 years. Silver Springs State Park now encompasses approximately 4,230 acres designated for public recreation and conservation and has been managed by the Florida Park Service since 2013.

Recreational opportunities for residents and visitors include camping, bicycling, canoeing, kayaking, swimming, hiking, horseback riding, and wildlife viewing.

The US Geological Survey (USGS) has collected discharge measurements from various locations along the Silver River and at the headspring since 1906 and has continuously monitored water levels downstream of the Silver Springs pool from 1947 to present. SJRWMD also collects hydrologic data at five locations along the Silver River. Flow and water-level data were compiled and analyzed from two USGS stations over a period of record (POR) from 1947 to 2010 to develop the Silver Springs minimum flows and levels (MFLs). The USGS-published annual mean discharge measurement over the selected POR was 742 cubic feet per second (cfs) or approximately 480 million gallons per day (MGD).

The primary water source into Silver Springs is the UFA, which is approximately 300 feet thick in the Silver Springs springshed. This unit of the aquifer is highly transmissive, which leads to the rapid flow of water observed in the springshed. Testing conducted in 2001 indicated that water emanating from the springs is less than 48 years old, and additional testing conducted in 2002 found sample ages to be 10, 19, and 27 years old, all of which are considered relatively young (SJRWMD, Technical Publication SJ2017-2).

Nitrate-N has been measured at Silver Springs since 1907 through a combined effort of USGS, SJRWMD, and FDEP; reporting by all three agencies has identified a clear upward trend in nitrate levels, increasing from an average of 0.38 mg/L to 1.2 mg/L from 1964 to 2010. Based on collected data, FDEP determined that elevated nutrient concentrations have impaired this body of water and established a TMDL for Silver Springs in 2012. Additionally, FDEP determined the non-impaired limit on the TMDL threshold of Nitrate-N to be 0.35 mg/L.

Due to the predominantly groundwater-supplied nature of this water body, the elevated Nitrate-N concentrations are believed to be linked to changing land uses throughout the springshed. The portion of the Silver Springs springshed in Marion County covers more than one-quarter of the County, throughout which the land use has changed significantly from 1960 to the present day.

1.3.2 Rainbow Springs Group and Rainbow River

The Rainbow Springs Group is within the Rainbow Springs State Park and comprises 1,472 acres; the Rainbow River System is also an aquatic preserve. Designated as a National Natural Landmark in 1971, Rainbow Springs first opened as a privately owned park in the 1930s. However, tourism dwindled with the growth of the interstate highway system and the park closed in 1974. In the 1990s, the park reopened as a State Park, supported by the Friends of Rainbow Springs community group and managed by the Florida Park Service. Recreational opportunities for visitors include camping, canoeing, kayaking, swimming, snorkeling, tubing, hiking, and wildlife viewing.

Historical records for the Rainbow Springs Group are limited. USGS has only collected flow measurements on the Rainbow River since 1965 from a gauge in Dunnellon, Florida, approximately 5 miles downstream of the headspring. Flow and water-level data were compiled and analyzed from this USGS station over a POR from 1965 to 2015 to develop the Rainbow River System MFL. The long-term average gauged flow during this period was 677 cfs or approximately 438 MGD.

The primary water source into the Rainbow Springs Group is the UFA, which is approximately 600 feet thick in the Rainbow Springs Group springshed. This area has minor confining units and some noted surficial aquifer; however, the springshed is generally considered unconfined UFA. This unit of the aquifer is highly transmissive, which leads to the rapid flow of water observed in the springshed. The Rainbow Springs Group has not been directly age-tested; however, the aquifer is highly transmissive between Silver Springs and the Rainbow Springs Group. Various modes of testing at Silver Springs have indicated that water emanating from these springs is relatively young – less than 48 years old; therefore, the age of the source water at the Rainbow Springs Group is also assumed to be relatively young.

Nitrate-N has been measured at Rainbow Springs since the late 1950s. The first 30 years of record show nitrate levels fluctuating between 0.1 and 0.3 mg/L. However, the nitrate concentration spiked in 1988 to 0.93 mg/L and each year since has remained above 0.5 mg/L. Based on collected data, FDEP determined that elevated nutrient concentrations have impaired this body of water and established a TMDL for the Rainbow Springs Group in 2013. FDEP determined the non-impaired limit on the TMDL threshold of Nitrate-N to be 0.35 mg/L.

Since this water body is predominantly groundwater-supplied, the elevated Nitrate-N concentrations are believed to be linked to changing land uses throughout the springshed. The portion of the Rainbow Springs Group springshed in Marion County covers nearly one-quarter of the County throughout which the land use has changed significantly from 1960 to the present day.

1.3.3 County Population and Land Use

Marion County's population has grown from approximately 52,000 in 1960 to approximately 350,000 today, representing more than 500-percent growth over the last 59 years. Figure 1-2 presents population data collected by the US Census Bureau for Marion County from 1960 to 2010, with an estimation of population in 2018 (University of Florida Bureau of Economic and Business Research [BEBR], 2019).

Figure 1-2 Marion County Population, 1960 to 2018

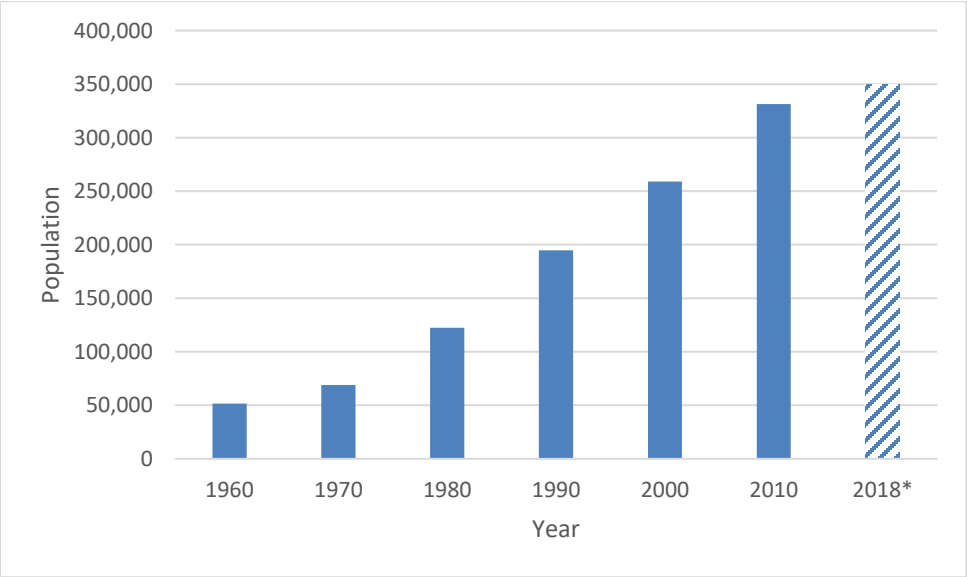


Table 1-1 presents data on the urbanization of the Marion County sections of the Silver Springs and Rainbow Springs Group BMAP and PFA areas versus the overall County's urbanization. The data presented show the growth of smaller parcels (less than 1 acre with an OSTDS) from 1960 to the present day. The total acreage of each area is displayed in the first column followed by the number of non-vacant (i.e., developed) small parcels in 1960 and 2019. The next two columns are calculations showing the growth in urbanization over the 1960 to 2019 period examined, which shows the large influx of population and provides context for the growth of OSTDSs and Nitrate-N in the area.

Table 1-1 Urbanization of Marion County

Area (Acreage)	1960 Number of Non-Vacant Small Parcels	2019 Number of Non-Vacant Small Parcels	Growth in Non-Vacant Acreage, 1960-Present (%)	Growth in Number of Non-Vacant Small Parcels, 1960-Present (%)
Silver Springs PFA (135,120)	1,513	27,137	1,605	1,694
Silver Springs BMAP (632,809)	3,518	58,184	1,418	1,554
Rainbow Springs Group and Rainbow River PFA (37,328)	65	3,624	6,435	5,475
Rainbow Springs Group and Rainbow River BMAP (434,804)	638	25,807	5,835	3,945
County (1,063,947)	5,133	100,556	1,826	1,859

The County is planning for future growth of the area, expecting that it will be further urbanized as additional populations infill. Figure 1-4 presents the County's future land use map from the 2035 Comprehensive Plan.

1.3.4 Marion County OSTDS Data

Based on FDEP's Nitrogen Source Inventory and Loading Tool (NSILT) modeling conducted for the 2018 BMAP, 29 percent of all nitrates in the Silver Springs BMAP area are attributable to OSTDS and 20 percent of all nitrates in the Rainbow Springs Group BMAP area are attributable to OSTDSs. Last updated in December 2019, the Florida Department of Health's (FDOH) OSTDS Inventory geographic information system (GIS) database, the Florida Water Management Inventory (FLWMI), reported 102,484 known-, likely-, or somewhat-likely septic systems within Marion County. Of those septic systems, 59,832 are in the Marion County section of the Silver Springs BMAP area and 25,092 are in the Marion County section of the Rainbow Springs Group BMAP area. There are 28,469 septic systems in the Silver Springs PFA and 3,626 septic systems in the Rainbow Springs PFA.

Typically, septic tanks constructed from steel have a 20- to 30-year useful life. Septic tanks constructed from concrete or plastic may last 30 to 40 years. On average, FDOH data appear to indicate an overall 20- to 30-year lifespan for septic tanks, with differences stemming from the amount of use, type of use, level of maintenance, and groundwater

characteristics. Figure 1-3 presents the number of septic systems constructed between 1987 and 2017 based on available FDOH OSTDS permits, Marion County Property Appraiser actual-year built data, and Marion County OSTDS permitting data.

Figure 1-3 Septic System Construction, 1989 to 2017

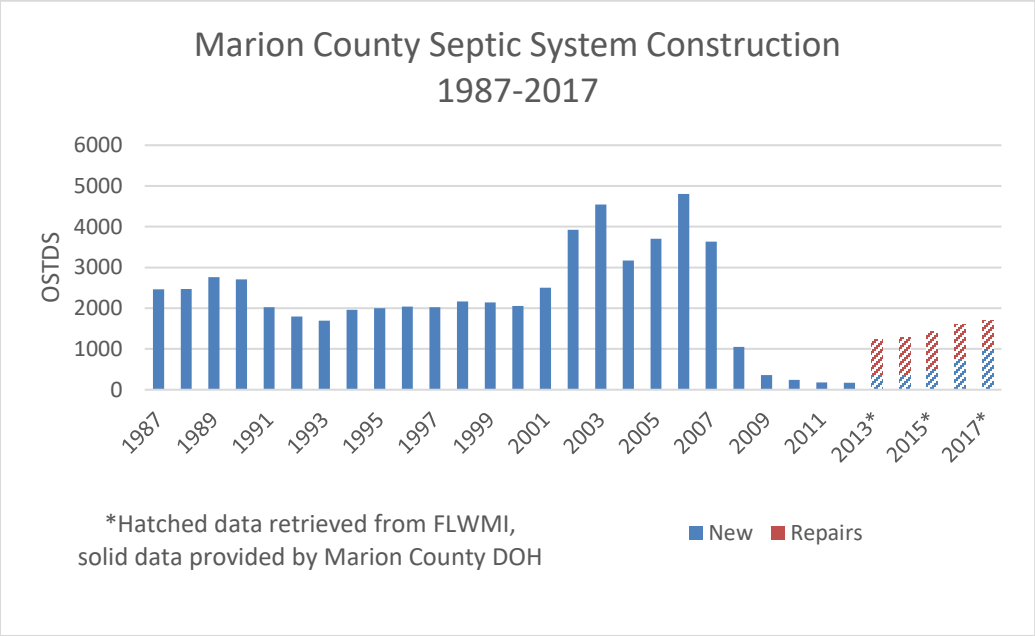
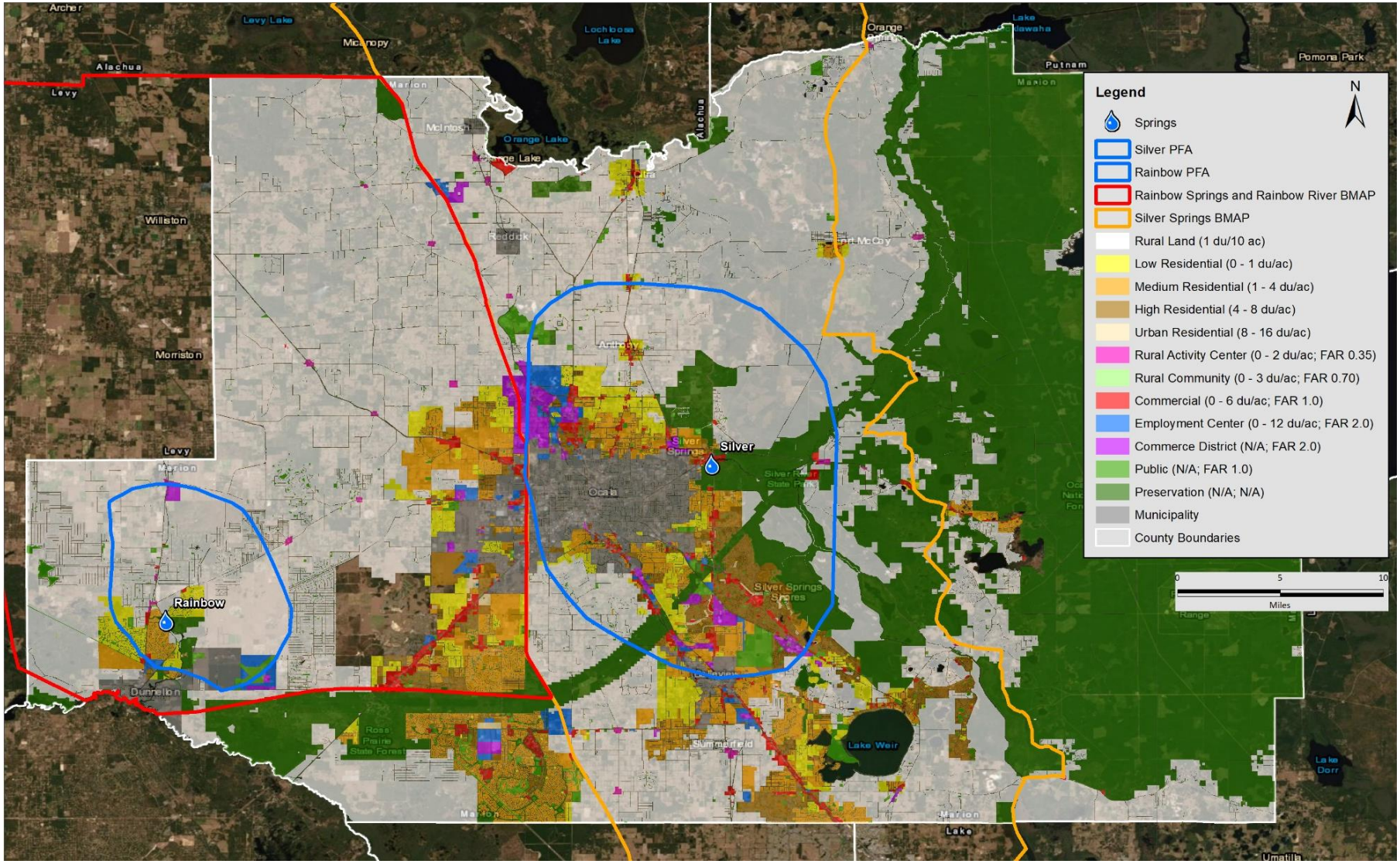


Figure 1-4 Marion County Future Land Use, 2035



1.4 THE SCIENCE ON SEPTIC NUTRIENTS ENTERING GROUNDWATER

Septic systems operate through a multi-step process that includes a septic tank and drainfield (or leach field). Once in the septic tank, solids settle out and the liquid effluent flows through a series of perforated pipes that are embedded in a drainfield. The effluent percolates into the drainfield and through a deep layer of soil, allowing additional treatment to occur before entering the groundwater. According to the FDEP's October 2017 *Springs Funding Guidance Document*, conventional septic systems attenuate approximately 50 percent of the nitrogen load – approximately 30 percent through the drainfield and approximately 20 percent through the soil.

All septic systems release the nutrients of nitrogen (primarily in the form of ammonia-nitrogen [Ammonia-N (NH_4^+ -N)]) and phosphorus to the groundwater from the drainfield. In a properly operating system, nitrifying bacteria in the upper portions of the drainfield naturally convert Ammonia-N to Nitrate-N (NO_3^- -N) in the presence of oxygen (O_2) in porous soils. As the effluent percolates deeper in the ground, denitrifying bacteria will convert a portion of the Nitrate-N to nitrogen gas (N_2 gas) if a carbon source is present and soil conditions are anoxic (low oxygen content). The N_2 gas will then escape to the atmosphere. The soil type and separation depth relative to the groundwater table play significant roles in the septic systems' treatment effectiveness. High-porosity soils found in many regions of Florida are saturated due to high groundwater and may also have a low organic matter content, making conditions unsuitable for providing the necessary treatment for nitrogen removal.

Figure 1-5 depicts how wastewater from the home is typically collected and conveyed to the septic system through drainpipes. High groundwater creates flooded soils, which reduce oxygen transfer and create low-oxygen levels leading to incomplete removal of nitrogen. In this situation, the conversion of Ammonia-N to Nitrate-N and Nitrate-N to nitrogen gas are impeded, leaving Ammonia-N to persist in the groundwater and ultimately impact surrounding surface waters including springs. If soils have high oxygen content and are not saturated and organic matter is not present (such as well-drained sandy soils), which is common for many areas of Marion County, the Ammonia-N will be converted to Nitrate-N. However, the denitrification process will not occur, and the Nitrate-N will percolate to groundwater and the local springs.

1.5 MASTER WASTEWATER FEASIBILITY ANALYSIS OBJECTIVES

Developing and implementing this Report is a joint effort of the Marion County Government and FDEP. Required under the 2016 Florida Springs and Aquifer Protection Act, this effort is based on the FDEP-adopted BMAP for Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River. It is the first major step in converting the BMAP areas from predominantly using septic systems to using centralized sewer collection and treatment or enhanced on-site treatment. This Report provides solutions and associated funding strategies that address the common goals of improving and restoring water quality in Silver Springs and the Rainbow Springs Group, protecting crucial fish and wildlife habitat, maintaining drinking water quality, and enhancing the community's quality of life. The following objectives support these BMAP goals:

- Summarize the need to reduce nutrient discharges.

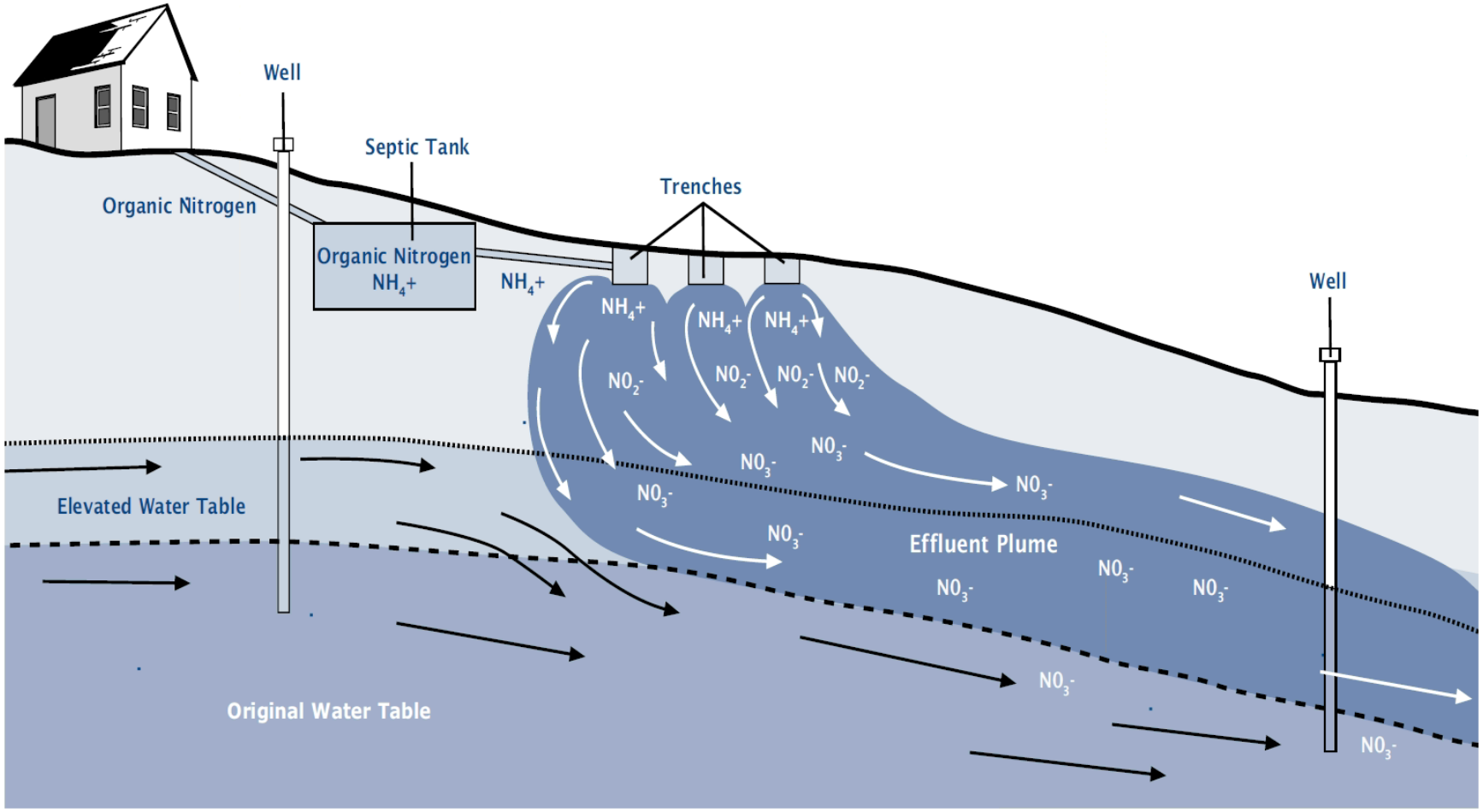
- Review and compile historical sewer system and water reclamation facility (WRF) flows and loads data.
- Model and predict system growth.
- Develop detailed consumer and wastewater flow estimates through buildout.
- Review existing wastewater collection and transmission systems.
- Review existing WRFs and prepare infrastructure extension recommendations.
- Develop Capital Improvement Plan (CIP) recommendations based on existing infrastructure needs.
- Develop a Public Outreach and Education Plan to disseminate information to the impacted communities and build stakeholder buy-in.

1.6 Guiding Criteria for Evaluating Septic-to-Sewer Conversions

This Report addresses the local and regional community's goal of reducing nitrogen loading to Silver Springs and the Rainbow Springs Group through septic to sewer (S2S) conversions, improving the sewer network, and identifying enhanced on-site treatment system options as appropriate. The conversion area evaluations and prioritizations incorporate the guiding principles of affordability, sustainability, efficiency, and reliability as described below:

- Affordability – Each project identified in the Report focuses on developing solutions and associated funding strategies to minimize the burden on residents and business owners.
- Sustainability – The Report incorporates a balanced approach to prioritize septic system replacements to maximize environmental benefits and provide long-term reductions in nutrient loadings in a manner that is financially and operationally sustainable for residents and business owners.
- Efficiency – The Report considers existing utility infrastructure and implements efficient construction methods based on the location of each project.
- Reliability – The Report considers existing wastewater treatment and conveyance infrastructure and identifies which components will require updating to provide a reliable product to the County's residents and businesses.
- Suitability – The Report identifies areas where enhanced OSTDS are appropriate due to long-term centralized sewer expansion limitations.

Figure 1-5 Typical Septic System and Drainfield



National Environmental Services Center, PIPELINE – Summer 2012; Vol. 23, No 1, Page 5.

2 PAST AND PRESENT – DEVELOPMENT OF A SEWER SYSTEM

This chapter provides a historical perspective of the County's sewer system development, a review of private utilities within the service area, and a summary of the present-day sewer system. This chapter also reviews the County and Cities' ongoing wastewater projects in the planning, design, and construction phases.

2.1 SEWER SYSTEM GROWTH AND DEVELOPMENT

Figure 2-1 shows Marion County is in North Central Florida, bordered approximately by the Withlacoochee River and the geopolitical boundaries of Sumter and Lake Counties to the south, Orange Creek and a number of small lakes to the north, and the geopolitical boundaries of Levy County to the west and Lake and Putnam Counties to the east. Marion County was officially formed in 1844 by Florida's territorial legislative council, creating it from portions of Alachua, Mosquito (Orange), and Hillsborough Counties. According to the 1850 US Census, Marion County had 3,338 residents and the common sewage disposal method consisted of outhouses or privies. The County population grew steadily over the next 100 years, reaching nearly 38,187 residents by the end of World War II. The post-war period was a time of significant growth for the County, with the population tripling between 1950 and 1980. Growth has yet to slow; the 2018 BEBR population estimate was 331,303.

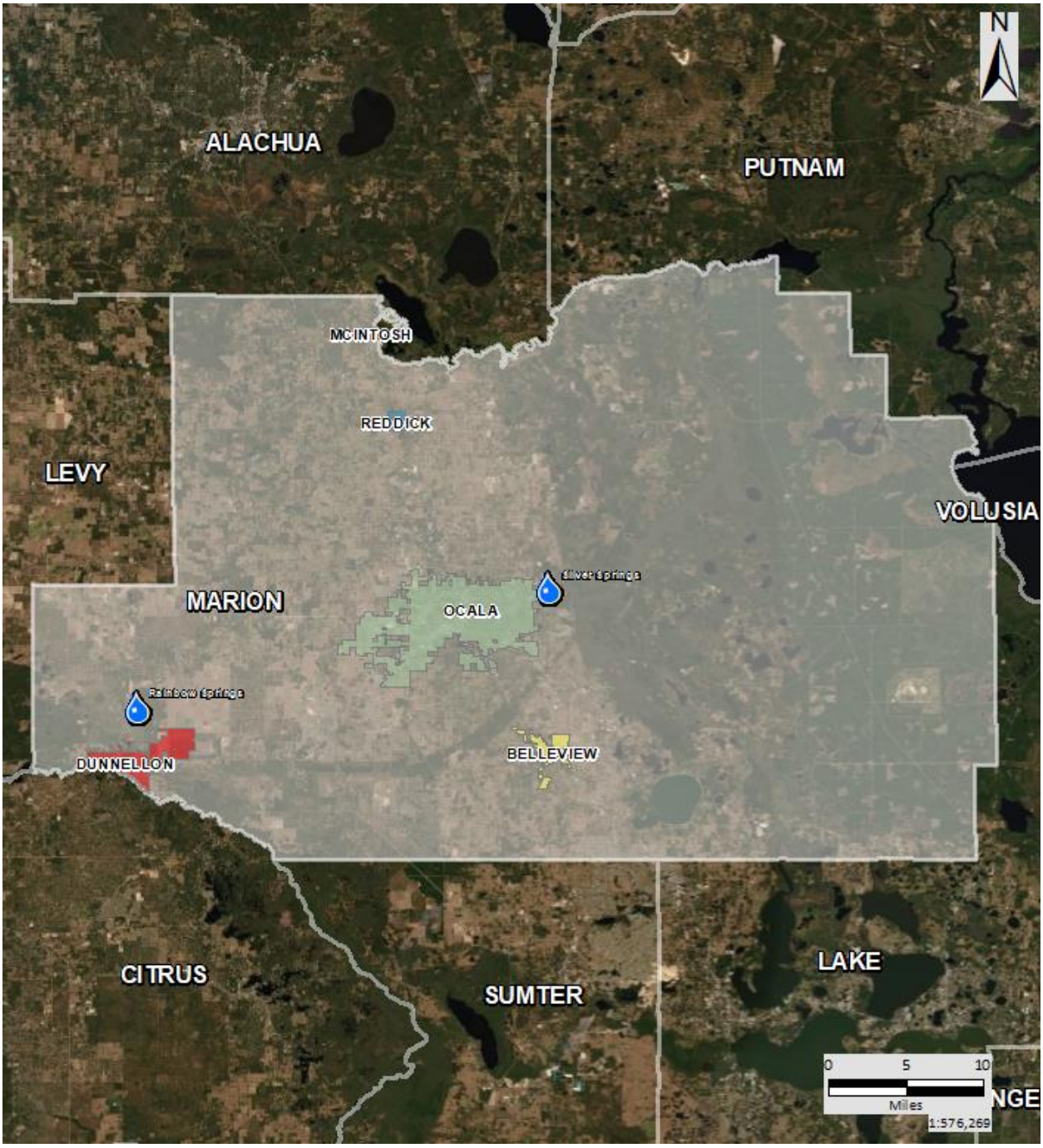
Four public utility providers serve the population of Marion County – two cities, a utility authority, and Marion County. The City of Ocala is the largest municipal utility provider of wastewater services by permitted treatment volume. Ocala has three WRFs – WRF #1, built in 1949, which is in the process of being decommissioned and no longer receives flows; WRF #2, which has been in operation since 1972 and is permitted to treat up to 6.5 MGD; and WRF #3, which has been in operation since 2003 and is permitted to treat up to 4 MGD. A significant portion of Ocala's treated effluent is reused for irrigation purposes, and the remaining unused treated effluent is discharged via land application methods.

The City of Dunnellon's utilities are now operated by FGUA, which locally operates three wastewater treatment facilities (WWTFs) with a combined capacity of 0.675 MGD – one in the City of Dunnellon, one in Rainbow Springs (in the process of being decommissioned), and one in Juliette Falls (in the process of being converted to a pump station). FGUA's treated effluent is completely discharged via land application to sprayfields.

The City of Belleview operates one 0.76-MGD WWTF and discharges restricted-public-access effluent to a sprayfield and public-access reuse to a local golf course. The incorporated municipalities of Reddick and McIntosh do not provide wastewater utility services.

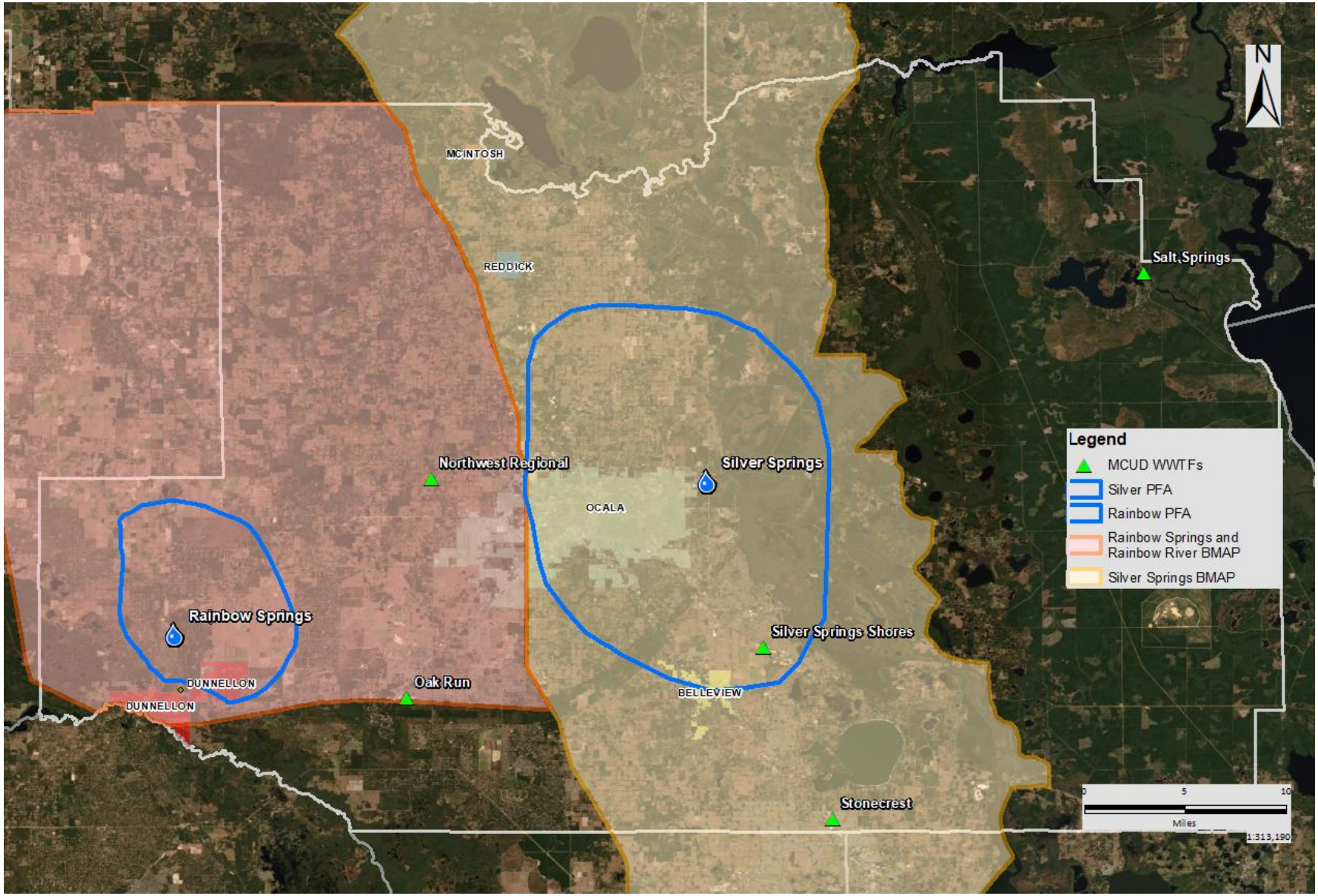
As the population of Marion County continues to grow and the demand for services rises, widescale septic-to-sewer conversion efforts will be a collaborative effort shared between these local utilities, Marion County, and the State of Florida.

Figure 2-1 Marion County Geographic Area



In 1987, the Florida Legislature created the Marion County Utility Authority to authorize the Board of County Commissioners of Marion County to own and operate utility services. The MCUD was officially established in 1993 with the acquisition of the Silver Springs Shores WRF. Today, MCUD provides wastewater collection, treatment, and disposal services to nearly 30,000 residents – almost 10 percent of the county-wide population – and operates five WWTFs: Northwest Regional (formerly Golden Ocala), Oak Run, Salt Springs, Silver Springs Shores (formerly Emerald), and Stonecrest. Figure 2-2 shows the MCUD facilities.

Figure 2-2 Marion County Wastewater Treatment Facilities



The 0.2-MGD Northwest Regional WWTF, formerly known as Golden Ocala, was originally constructed by Marion County in 2005 and is currently under construction for a planned expansion to 0.8 MGD and an upgrade to advanced wastewater treatment (AWT) standards. The expansion of the Northwest Regional WWTF is under consideration to accommodate the new World Equestrian Center (WEC) currently under development; through rerating, the WWTF permitted capacity can be increased to 1.0 MGD.

The Stonecrest WWTF, constructed by Marion County in 1989, was designed to treat 1 MGD, but it has a permitted capacity of 0.670 MGD because of the maximum capacity of the rapid infiltration basins (RIBs) and irrigation reuse system.

Oak Run, constructed in 1984, is a 1.6-MGD WWTF that was acquired by MCUD in 2001. Oak Run is expected to require expansion within the next 20 years to accommodate growth in the Marion Oaks and Oak Run service areas.

Salt Springs, a 0.085-MGD WWTF constructed in 2004, was acquired from a private developer. Marion County reconstructed this facility between 2010 and 2013, converting it to a membrane bioreactor plant.

Silver Springs Shores, constructed in 1993 by a private developer, was acquired by MCUD in 2004. Silver Springs Shores was a 1.5-MGD WRF that was recently rerated to a 2.0-MGD permitted capacity; construction is underway to expand the Silver Springs Shores WRF to 2.0 MGD and update the WWTF to AWT standards.

2.2 Private Utilities Within the Service Area

Over 100 private package plants continue to operate in Marion County as of December 2019. Appendix A presents a full listing of all private package plants, including domestic wastewater (DW), industrial wastewater (IW), concrete batch plant (CBP), residual application facility (RAF), and residuals/septage management facility (RES). Figure 2-3 shows 96 DW package plants currently in operation. Table 2-1 lists the number of DW facilities within each BMAP and PFA area. The DW package facilities may connect into the County or one of the three other municipal wastewater systems in the future. However, wastewater from industrial facilities tend to have poor water quality for domestic wastewater treatment as evidenced by low biological oxygen demand and other constituents not common to domestic wastewater. Treating this type of discharge at one of the centralized WWTFs within the County is not recommended without pretreatment or without a thorough understanding of the industrial wastewater composition. The RAF and RES facilities are not expected to connect.

Figure 2-3 Private Package Plants in Marion County

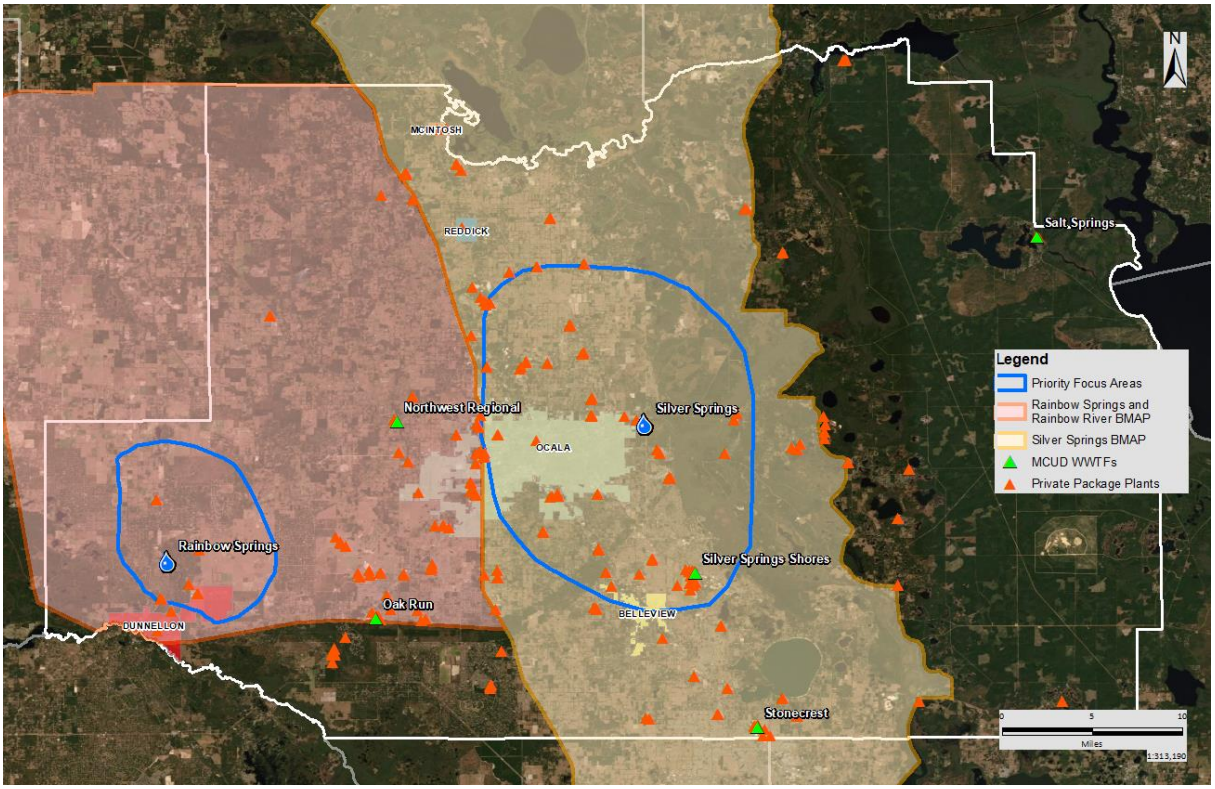


Table 2-1 Private Domestic Wastewater Facilities in BMAP Areas and PFAs

BMAP Area	# of Facilities	PFA	# of Facilities
Rainbow	27	Rainbow	4
Silver	55	Silver	23
Outside BMAP	14	Outside PFA	69
Total	96	Total	96

2.3 Ongoing Projects and Programs

Marion County is committed to maintaining and, where feasible, expanding its program of effluent recharge, reuse, and disposal. The County is also committed to protecting and improving the springs and associated waterbodies, focusing on sustainable future development and environmental stewardship. To support these goals, the County is currently managing several projects and planning several new projects that will impact the overall wastewater system.

2.3.1 MCUD PROJECTS

2.3.1.1 Recent Feasibility and Planning Efforts

MCUD has undertaken various planning efforts to understand the plant expansion needs at the Oak Run, Marion Oaks, and Northwest Regional WWTFs. Additionally, Marion County is exploring the feasibility of a new Rainbow Springs regional WWTF and associated S2S projects.

The *Marion Oaks WWTF 2016 Master Plan* was conducted by Pigeon-Roberts & Associates to assess capacity needs to serve the Marion Oaks area flow that is currently served by the Oak Run WWTF. The *Oak Run Water Reclamation Facility Capacity Study Report* from 2018 was conducted by the County to assess the current and future capacity needs of the Oak Run WWTF. A future study is needed to combine the results of the two reports and determine the most cost-effective way to provide long-term capacity for the surrounding communities. Current options include building a new Marion Oaks WWTF, expanding the Oak Run facility, or building a brand new regional WWTF that will accept flows from Marion Oaks, Oak Run, and surrounding communities and can be expandable as demand increases.

An expansion of the existing Golden Ocala WWTF was determined as required to provide additional treatment capacity to accommodate the flows from the new World Equestrian Center (WEC), future septic conversion projects, and general population growth in northwest Marion County. The expanded facility is to become Marion County's Northwest Regional WWTF, with current plans to expand to 0.8 MGD and potential rerating to 1.0 MGD. A future 1.0 MGD planned expansion will bring the total permitted capacity to 2.0 MGD. The expanded treatment facility will also be upgraded to AWT standards.

The County is currently working on the Rainbow Springs Sewer Feasibility Study. The purpose of the Study is to evaluate the feasibility of constructing a regional WWTF near Rainbow Springs and evaluate the viability of connecting surrounding areas to the new WWTF by means of S2S conversion projects. These projects will extend sewer service to commercial and residential parcels and eliminate septic systems. This effort is in conjunction with and in support of the current update of the Silver Springs and Rainbow Springs BMAP implemented by FDEP.

2.3.1.2 Utility Extensions

Marion County received a Community Development Block Grant to provide water and sewer extensions within the Silver Springs Shores subdivision. The project includes four phases of new utilities. Phase One includes 18 parcels and will go out to bid in 2021. The three additional phases include 37 parcels, 31 parcels, and 38 parcels.

2.3.2 FGUA (FORMERLY CITY OF DUNNELLON) PROJECTS

2.3.2.1 Burkitt Road S2S Project

FGUA, with support from FDEP, has received initial funding for a project to design and construct a sanitary sewer system that will remove from service approximately 11 septic tanks from the associated single-family residential lots. The Burkitt Road S2S Project is expected to reduce Nitrogen loading within the Rainbow Springs Group BMAP by approximately 111 pounds per year. Design services began in 2019.

2.3.2.2 Chatmire S2S Project

FGUA, with support from FDEP, is pursuing a project to design and construct a sanitary sewer system that will remove from service approximately 117 septic tanks and provide stub-outs to an additional 93 single-family residential lots. The Chatmire S2S Project is expected to reduce Nitrogen loading within the Rainbow Springs Group PFA by approximately 2,119 pounds per year. Design services began in 2020.

2.3.2.3 Rainbow River – Rio Vista S2S Project

FGUA, with support from FDEP, is pursuing a project to design and construct a sanitary sewer system that will remove from service approximately 333 septic tanks from the associated single-family residential lots. The Rainbow River Rio Vista S2S Project is expected to reduce Nitrogen loading within the Rainbow Springs Group PFA by approximately 3,353 pounds per year. Design services are underway.

2.3.2.4 180th Avenue Package Plant Abatement

FGUA, with support from FDEP, is working on a project that includes design, permitting, and construction of a wastewater force main from the Juliette Falls WWTF to the Dunnellon WWTF. The project will allow the decommissioning of the Juliette Falls WWTF and the Rainbow Springs State Park Campground package WWTF and provide the opportunity to decommission the Dunnellon High School/Elementary School complex and Sateke Village package WWTFs in the future. This project will remove 2,630 pounds of Nitrogen per year from the Rainbow Springs Group BMAP.

2.3.3 City of Belleview Efforts

2.3.3.1 S2S Planning Study

The City of Belleview, with support from FDEP, completed a comprehensive S2S study in 2019. The purpose of the study was to identify projects that will eliminate OSTDSs, reduce total Nitrogen, and provide environmental benefits to Silver Springs. This study identified six regions where sewer service could be extended, and septic tanks eliminated including recommended alternatives and estimated probable costs.

2.3.3.2 Green Meadows S2S Project

The City of Belleview, with support from FDEP, has received initial funding for a project to design and construct a sanitary sewer system that will remove from service up to 155 septic tanks from the associated single-family residential lots. The Green Meadows S2S Project was identified in the 2019 Septic to Sewer Planning Study and is expected to reduce Nitrogen loading within the Silver Springs springshed by approximately 1,593 pounds per year. The project was approved in October 2019 and design is underway.

2.3.4 City of Ocala Efforts

2.3.4.1 Well and Septic Tank Reduction Program

The City of Ocala, with support from FDEP and SJRWMD, is connecting approximately 850 properties with septic tanks to centralized sewer within the Silver Springs springshed. Once connected, the septic tanks will be abandoned. Projects in the design phase include

Timberwood, Leonardo Estates, and four phases along 35th Street that are being developed in conjunction with the County. The Southwood Villas project is under construction. In addition to sewer connections, properties that do not have potable water connections will receive metered potable water services. The completion of this project will remove 20,321 pounds of Nitrogen per year from the Silver Springs BMAP.

2.3.4.2 WRF #2 Nutrient Reduction Plan

The City of Ocala, with support from FDEP and SJRWMD, is designing, permitting, and constructing a project that will upgrade WRF #2 to provide AWT and expand the availability of reclaimed water for irrigation use. The completion of this project will remove 623,000 pounds of Nitrogen per year from the Silver Springs BMAP and will produce 1 MGD of reuse water, replacing groundwater withdrawals.

3 OSTDS REMEDIATION PLAN

3.1 RESTORATION OPTIONS

This chapter reviews different centralized collection system and de-centralized enhanced Nitrogen treatment septic remediation alternatives as restoration options for the project area. Chapter 8 presents the cost analyses conducted to determine affordable improvements and efficient implementation sequencing.

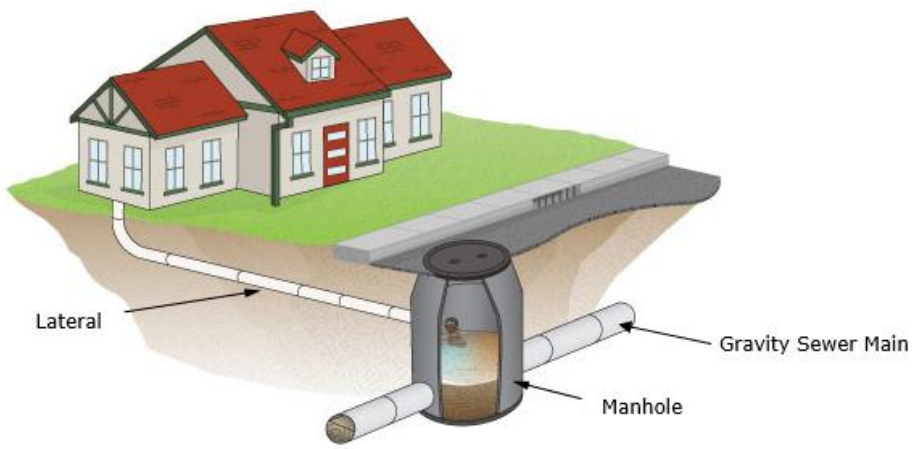
3.1.1 CENTRALIZED COLLECTION SYSTEM ALTERNATIVES

Sewer collection systems are generally categorized by their transport mechanism, which include pressure, vacuum, and gravity. The most common types of collection systems currently implemented in Florida include low-pressure septic tank effluent pumped (STEP) and grinder pump, vacuum collection, and gravity collection systems.

3.1.1.1 Gravity Collection System

Figure 3-1 shows a typical gravity collection system.

Figure 3-1 Gravity Collection System



(Schematic from RMIT University.)

Gravity collection systems are a common, traditional method to collect wastewater for public utilities. Sewage flows by gravity from the home through 4-inch sloped service lateral pipes to the gravity sewer mains. Gravity sewer mains are typically 8-inch diameter and larger. Manholes are typically required every 400 feet, at each main intersection, and at changes in flow direction. The network of gravity sewer mains and manholes is considered the gravity collection system. The gravity collection system typically conveys sewage to a transfer LS that pumps the sewage under pressure to the WWTF for treatment.

Advantages

- Lowest O&M costs.
- Highest long-term reliability; operates during power failures and emergency situations.

- Gravity system can provide some storage of wastewater flows during emergencies or system failures.
- Homeowner easements not needed (but may require temporary easement during construction).
- Discharges to centralized system which provides higher nutrient removal.
- "Flush it and forget it" approach for homeowners.

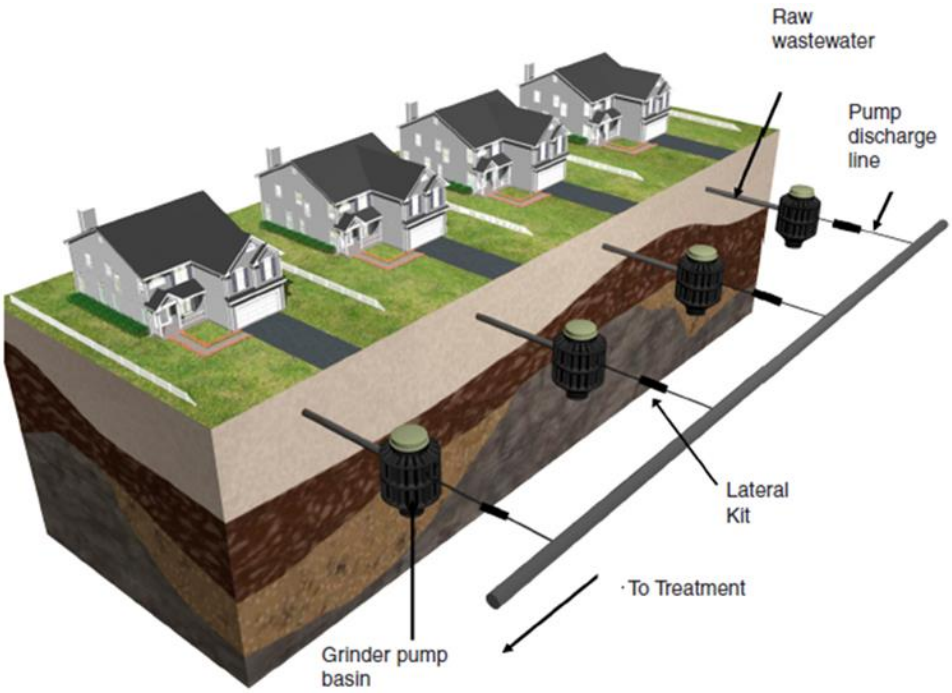
Disadvantages

- High capital costs for retrofitting existing neighborhoods.
- Deeper excavations typically required.
- High community disruptions to streets, sidewalks, etc.
- Higher infiltration potential.

3.1.1.2 Low-Pressure (STEP and Grinder Pump Systems)

Figure 3-2 shows a typical grinder pump system.

Figure 3-2 Grinder Pump System



(Schematic from E/One.)

Low-pressure STEP and grinder pump systems consist of conventional drain, waste, and vent piping within an individual residence connected to an existing conventional septic tank or a packaged grinder pump basin. The sewage gravity flows to the existing septic tank or basin. After a given volume of sewage accumulates, the sewage is pumped through a small-diameter force main to a transfer lift station or the WWTF for treatment.

Advantages

- Shallow excavation, which reduces the potential of encountering limerock and groundwater.
- Minimizes community disruptions to street, sidewalks, etc.
- Low infiltration potential.
- Discharges to centralized system which provides higher nutrient removal.

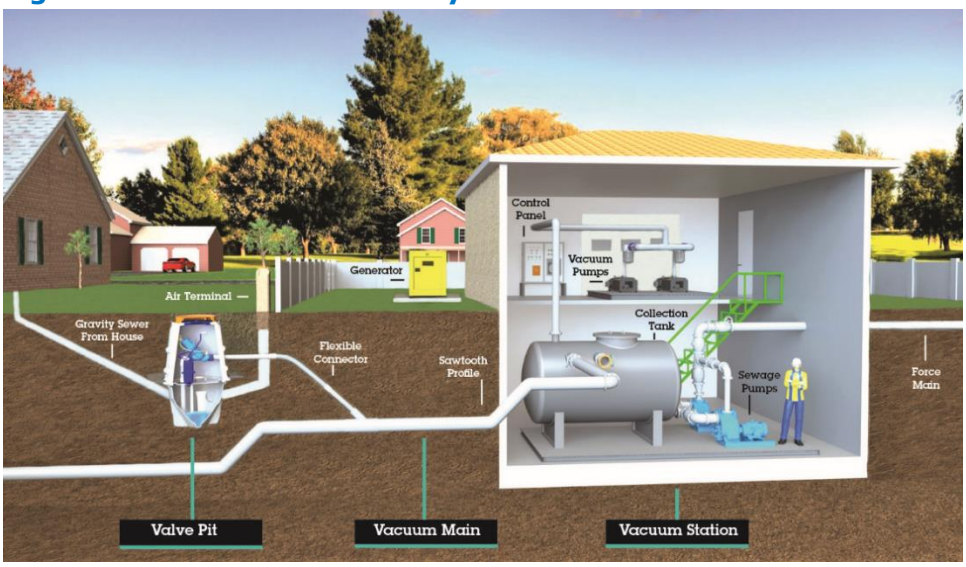
Disadvantages

- Higher operation and maintenance (O&M) costs than gravity sewer; may require maintenance for both homeowner and County.
- Possible poor condition of existing septic tanks (for STEP systems).
- May require an easement.
- Requires new power supply to each resident and a dedicated control panel.
- Higher possibility of overflows onto private property due to power or equipment failure.

3.1.1.3 Vacuum Collection System

Figure 3-3 shows a typical vacuum sewer system.

Figure 3-3 Vacuum Sewer System



(Schematic from Aqseptence Group.)

In a vacuum system, sewage flows by gravity from two to four homes/structures into a valve pit. The valve pit has a pneumatic valve that operates by pressure (no electrical power is required). The valve pit pneumatic valve opens automatically when a given quantity of sewage accumulates in the valve pit. When the valve opens, the sewage in the pit is "vacuumed" into small-diameter gravity piping (minimum of 4 inches in diameter) to the vacuum collection station. The vacuum collection station collects, stores, and pumps the sewage via pressure through a force main to the WWTF.

Advantages

- Shallow excavation, which reduces the potential of encountering limerock and groundwater.
- Minimizes disruptions to street, sidewalks, etc.
- Valves operate pneumatically so power is not required.
- Discharges to centralized system which provides higher nutrient removal.

Disadvantages

- Higher O&M costs than gravity sewer.
- Moderate infiltration potential.
- High capital cost for smaller developments.
- More precise construction techniques (sawtooth-pattern collection system piping) compared to low-pressure.

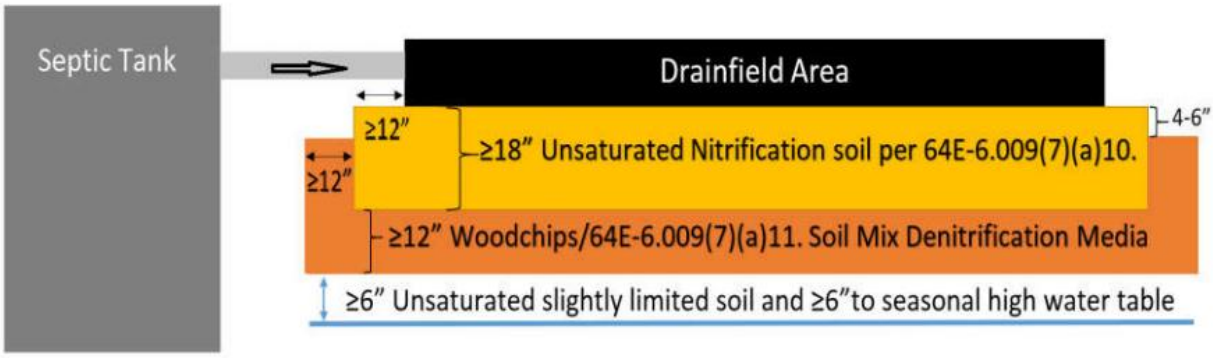
3.1.2 Enhanced Treatment of Nitrogen On-Site System Alternatives

FDOH has identified allowable enhancements to OSTDSs that will provide adequate Nitrogen-removal rates in accordance with National Sanitation Foundation/American National Standards Institute (NSF/ANSI) 245: Nitrogen Reduction. The standard covers residential wastewater treatment systems with rated capacities between 400 and 1,500 gallons per day (gpd). A minimum Nitrogen reduction of 50 percent must be achieved. Options that provide for the repair, upgrade, or replacement of an existing OSTDS to meet Nitrogen-removal requirements include in-ground Nitrogen-reducing biofilters, Nitrogen-reducing aerobic treatment units (ATUs), and performance-based treatment systems (PBTSs).

3.1.2.1 In-Ground Nitrogen-Reducing Biofilter

Figure 3-4 shows a typical in-ground nitrogen-reducing biofilter.

Figure 3-4 In-Ground Nitrogen-Reducing Biofilter



(Schematic from Florida Department of Health.)

The in-ground Nitrogen-reducing biofilter option is a passive system, which includes a denitrification layer under 18 inches of sand fill under the OSTDS drainfield area. The denitrification layer is made up of a mixture of fine aggregate – course sandy loam, sandy loam, loamy sand, fine sandy loam, very fine sand, loamy fine sand, or loamy very fine

sand – and a lignocellulosic material, chips or shavings of untreated lumber, blended urban waste wood mulch, yellow pine sawdust, 2- to 3-inch wood chips, or other material demonstrated to be effective at denitrification. The denitrification layer is not less than 12 inches thick, extends 12 inches beyond the perimeter of the drainfield, and wraps 12 inches upward. Additionally, the denitrification layer bottom must be 6 inches above the seasonal high groundwater table. The denitrification layer must be inspected during construction, requires special repair and maintenance procedures, and must be tested for performance 10 years after installation to determine if media replacement is warranted. These systems are estimated to achieve 65-percent Nitrogen removal.

Advantages

- Treatment occurs on site without the need for a centralized sewer.
- Can be used in conjunction with an existing septic tank.
- Potential additional grant funding may be available.

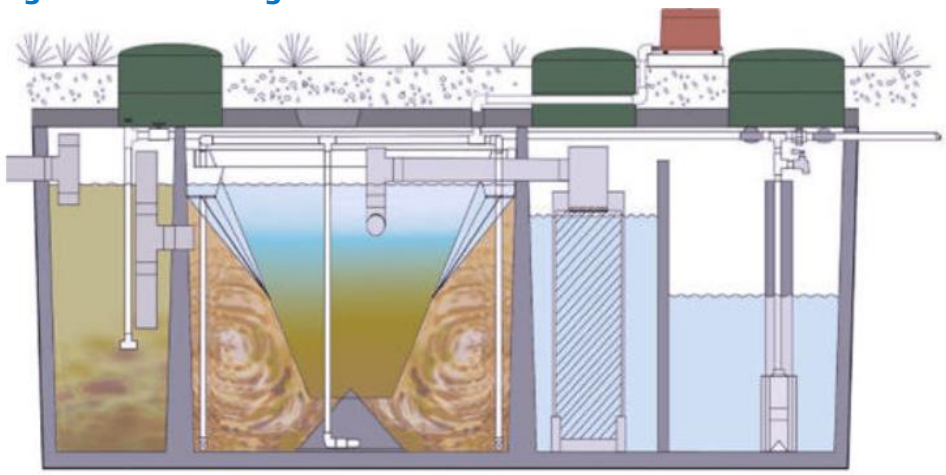
Disadvantages

- O&M requirements for homeowners (similar to a conventional septic system).
- Limited applications due to groundwater clearance requirements.
- Requires more space than a conventional septic system.

3.1.2.2 Nitrogen-Reducing ATU

Figure 3-5 shows a typical Nitrogen-reduction ATU.

Figure 3-5 Nitrogen-Reduction ATU



(Schematic from Florida Onsite Systems and Design.)

The ATU system is more efficient at processing waste than a conventional septic tank and drainfield. It works by reducing the amount of biological material entering the drainfield. The Nitrogen-reducing ATU systems typically involve biological denitrification processes such as mixed biomass using suspended growth, fixed film, or an unsaturated media filter or two-stage segregated biomass. In both processes, treatment is accomplished by bacteria respiration. In the mixed biomass process, recirculation with fresh incoming wastewater is essential for continuous denitrification. The two-stage segregated biomass process requires external carbon or chemical addition. All ATU systems typically consist of a pump, pipes,

and diffusers. These systems require a maintenance contract and operating permit from the County health department. Effluent-quality laboratory samples are required to be submitted by the maintenance entity every 6 months for residential systems and every 3 months for commercial systems, along with an inspection/maintenance report. FDOH annually inspects the maintenance and performance of the system. These systems are estimated to achieve 65-percent Nitrogen removal.

Advantages

- Treatment occurs on site without the need for a centralized sewer.
- Potential additional grant funding may be available.

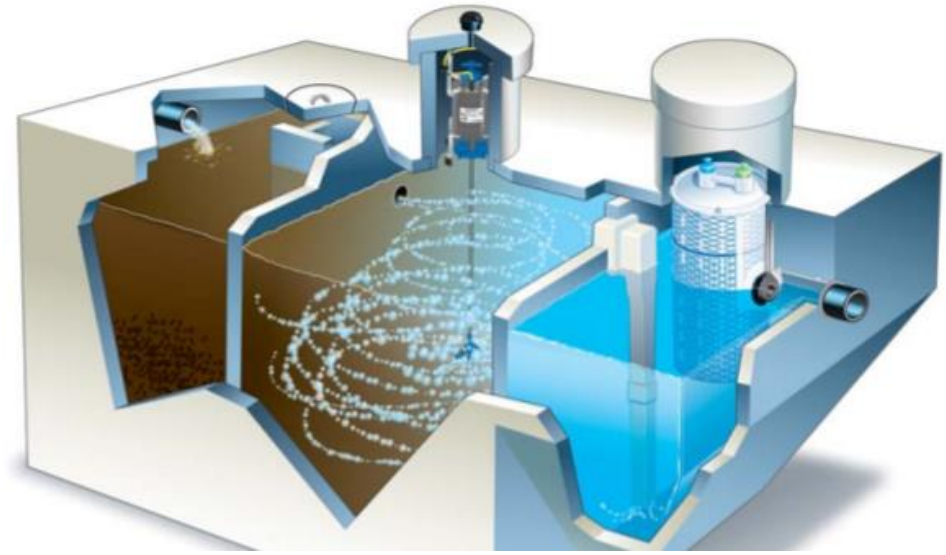
Disadvantages

- Requires consistent wastewater inflows for optimal performance.
- Additional O&M requirements for homeowners.
- Additional permitting requirements.

3.1.2.3 Performance-Based Treatment System (PBTS)

Figure 3-6 shows a typical PBTS.

Figure 3-6 Performance-Based Treatment System



(Schematic from Norwalk Wastewater Equipment Company.)

The PBTS can include a Nitrogen-reducing ATU and other components. For example, the system may include tanks that percolate effluent down through a medium such as peat moss or synthetic material or chlorinator/de-chlorinators, ultraviolet (UV) lights, and/or effluent recirculation. They must be engineer-designed and require an approved maintenance contract and operating permit from the County health department. Effluent-quality laboratory samples are required to be submitted by the maintenance entity every 6 months for residential systems and every 3 months for commercial systems, along with an inspection/maintenance report. Different sample levels are required based on the type of PBTS and the specific site conditions. FDOH annually inspects the maintenance and

performance of the system. These systems are estimated to achieve 65- to greater than 90-percent Nitrogen removal than conventional septic systems.

Advantages

- Treatment occurs on site without the need for a centralized sewer.
- Potential additional grant funding may be available.

Disadvantages

- Additional O&M requirements for homeowners.
- Additional permitting requirements.

3.2 Population, Wastewater Flow, and Nutrient Loading Estimates

This section reviews the current and projected population growth over a 20-year period of interest, the current and projected wastewater flows over the period of interest, and the modeling results of septic tank nutrient discharges in the PFAs. Population growth and nutrient-loading metrics are presented for each PFA, highlighting opportunities for nutrient load reduction in areas where the aquifer is most vulnerable to inputs and where the most connections exist between groundwater and the springs.

Available data from the US Census Bureau, the Marion County Property Appraiser, MCUD, SJRWMD, SWFWMD, FDEP, and the University of Florida's BEBR were used to develop detailed population estimates, wastewater flow estimates, and Nitrogen discharges for present day and buildout scenarios. Septic tank Nitrate discharges were estimated using the FDEP NSILT.

3.2.1 Current Population, Wastewater Flow, and Septic Tank-Based Nitrogen-Loading Estimates

Current population estimates were developed based on spatially located population projections developed by SWFWMD. SWFWMD combined US Census Bureau population data, BEBR growth data, and property appraiser GIS parcel data to obtain current residential population and residential population projections. Based on these data, the current residential population of Marion County was estimated to be 349,267 as of 2017. Updated US Census Bureau data give a population of 359,977 as of July 2018; for consistency of calculations, the SWFWMD data were used. Table 3-1 presents a detailed breakdown of the estimated residential population by BMAP and PFA as well as the unincorporated population within each PFA.

Table 3-1 Marion County Population Estimates

Springs Group	Population		
	BMAP	PFA	Unincorporated PFA
Silver Springs	220,330	131,536	78,771
Rainbow Springs Group	89,500	9,723	9,722

Wastewater flows within the MCUD service areas were estimated based on a combination of WWTF discharge monitoring reports (DMRs) and tax parcel data. Current total wastewater flows from residential and non-residential properties connected to the MCUD wastewater collection and transmission system are approximately 2.456 MGD average daily flow (ADF), or 185.5 gpd ADF per equivalent residential unit (ERU). Based on the BEBR estimate of average persons per household (PPH) in Marion County, 2.48, this equates to 74.8 gallons per capita per day (GPCD).

Total county-wide estimated wastewater flows from all non-vacant residential parcels were calculated based on the number of residential units per parcel, PPH, and GPCD for the County, BMAPs, PFAs, and unincorporated PFAs. The total estimated residential wastewater flow within the County is 26.13 MGD ADF. Table 3-2 summarizes the total estimated residential wastewater flow by BMAP and PFA as well as unincorporated PFA.

Table 3-2 Estimated Residential Wastewater Flows

Springs Group	Estimated Wastewater Flow (MGD ADF)		
	BMAP	PFA	Unincorporated PFA
Silver Springs	16.48	9.84	5.89
Rainbow Springs Group	6.69	0.73	0.73

Current non-residential wastewater flows were estimated based on parcel data from the Marion County Property Appraiser and provisions of FDOH Chapter 64-E6, Florida Administrative Code (FAC), *Standards for Onsite Sewage Treatment and Disposal Systems*. Non-vacant commercial, industrial, and institutional parcels were identified and, based on Department of Revenue use code, estimated wastewater flows from each parcel were calculated on a maximum daily flow (MDF) basis. Based on known daily wastewater flows at the five MCUD WWTF's, an MDF:ADF factor of 1.2 was applied to the flow to achieve ADF for consistency with residential flow estimates. The total current non-residential wastewater flows within Marion County are estimated to be 17.97 MGD ADF. Table 3-3 summarizes the total projected non-residential wastewater flow by BMAP and PFA as well as unincorporated PFA. Appendix B contains detailed non-residential wastewater flow assumptions.

Table 3-3 Estimated Non-Residential Wastewater Flows

Springs Group	Estimated Wastewater Flow (MGD ADF)		
	BMAP	PFA	Unincorporated PFA
Silver Springs	13.67	10.27	1.58
Rainbow Springs Group	3.74	0.20	0.20

Nitrogen loads from OSTDSs within the PFAs were calculated using FDEP's GIS- and spreadsheet-based NSILT and the following formula:

$$L = N * P * I * (1 - D) * R$$

where:

- L is the total Nitrogen load reaching the UFA.
- N is the number of OSTDSs in the springshed.

- P is the person per household.
- I is the per capita Nitrogen load.
- D is the soil attenuation rate.
- R is the Floridan aquifer recharge factor.

The number of OSTDSs were obtained from the FDOH Florida Water Management Inventory (FLWMI) database for Marion County. The FLWMI database provides information on which parcels have known septic or sewer, are likely or somewhat likely to have septic or sewer, or the status is unknown. Only those parcels with known, likely, or somewhat likely septic designations were considered; the N for those parcels was 1. If a residential property (those with Department of Revenue (DOR) codes 001 through 008) was identified by the Marion County Property Appraiser as having multiple residential units, the N value of that parcel was multiplied by the number of residential units to account for larger potential wastewater flows.

The PPH was obtained from BEBR estimates for Marion County and is estimated to be 2.48. However, many people with a home septic system most likely have access to a facility connected to a sewer system or non-residential septic system during their weekly routine (i.e., work, school, etc.), which thereby reduces Nitrogen inputs to their home septic system. In FDEP NSILT analyses, common practice is to discount the residential Nitrogen-loading estimate to account for this difference. According to the US Census Bureau 2010 census in Marion County, 66.2 percent of the population is of school or working age, ages 5 to 64; and according to the Bureau of Labor Statistics, spend 43.5 hours (or 25.9 percent) of the week away from home. Applying these values, the effective household population in Marion County is reduced by 17.1 percent, yielding an adjusted P of 2.05 for all residential parcels.

An equivalent PPH was also calculated for non-residential properties. Wastewater flow estimates for each non-residential parcel were calculated and divided by the per capita wastewater estimate for Marion County, 74.8 GPCD ADF, to achieve an equivalency. These values were used as P for non-residential properties.

Multiple literature sources, including the US Environmental Protection Agency (EPA), have reported the per capita Nitrogen load to OSTDSs as 9.012 pounds of Nitrogen per year. This value was used for I.

The soil attenuation rate accounts for natural Nitrogen removal in the soil profile and varies throughout Marion County, with literature values ranging from 10 to 50 percent. The value used by FDEP for all NSILT analyses is 50 percent; therefore, a value of 0.5 was used for D.

The Floridan aquifer recharge factor is based on the recharge rates at each septic tank location, accounting for reactive Nitrogen losses along the travel path to and from the OSTDS to the UFA. FDEP developed a UFA recharge assessment that identifies areas of high, medium, and low recharge and discharge; this recharge assessment was applied within the Silver Springs BMAP and PFA areas and within the Rainbow Springs Group BMAP areas and PFAs. High recharge, greater than or equal to 10 inches per year, would indicate low Nitrogen attenuation and is assigned an R factor of 0.9. Medium recharge, 3 to 10 inches per year, is assigned an R factor of 0.5; and low recharge, 0 to 3 inches per year, is assigned an R factor of 0.1. Areas identified as discharge zones are presumed to be areas

where the UFA is artesian (upward potentiometric gradient), indicating no net Nitrogen loading to the aquifer; these were assigned an R factor of 0.

Each value was input into the above formula to achieve a final L. Table 3-4 estimates the Nitrogen loading from OSTDSs in the PFAs and unincorporated PFA areas.

Table 3-4 Estimated NSILT OSTDS Loading

Springs Group	Estimated Nitrogen Loading (lb/yr)	
	PFA	Unincorporated PFA
Silver Springs	318,245	223,122
Rainbow Springs Group	31,176	31,176

Note: lb/yr = pounds per year.

3.2.2 Buildout Population and Wastewater Flow

Projected population growth was calculated in 5-year increments from 2020 to 2040 within each PFA and, more specifically, the unincorporated portion of the PFA areas based on SWFWMD spatial population projections and BEBR growth rates. In the following tables, "unincorporated PFA" represents the area of the PFA outside of city boundaries and within MCUD's service area. Table 3-5 shows overall Marion County population growth through 2040 based on "medium growth" BEBR rates. The medium-growth rate was selected because it most closely resembles historical growth rates in Marion County.

Table 3-5 BEBR Population Growth Projections for Marion County

Year	2017	2020	2025	2030	2035	2040
Population Estimate	349,267	364,200	386,100	404,900	423,000	438,500
Growth Rate (%)	—	4.28	6.01	4.87	4.47	3.66

Table 3-6 shows residential population growth in the Silver Springs PFA and the unincorporated portion of the PFA areas projected through 2040 based on the selected BEBR medium-growth rate. Table 3-7 shows residential population growth in the Rainbow Springs Group PFA and the unincorporated portion of the PFA areas projected through 2040 based on the selected medium-growth rate. The tables include projected potential wastewater flows from the population estimates based on 74.8 GPCD ADF.

Table 3-6 Projected Residential Population and Wastewater Flows

	2019 Estimate	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Silver Springs PFA						
Residential Population	131,536	136,197	142,500	147,567	152,293	156,377
Wastewater Flows (MGD)	9.84	10.19	10.66	11.04	11.39	11.70
Unincorporated Portion of Silver Springs PFA						
Residential Population	78,771	82,301	87,724	92,284	96,639	100,389
Wastewater Flows (MGD)	5.89	6.16	6.56	6.90	7.23	7.51

Table 3-7 Projected Residential Population and Wastewater Flows

	2019 Estimate	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Rainbow Springs Group PFA						
Residential Population	9,723	9,996	10,429	10,806	11,172	11,489
Wastewater Flows (MGD)	0.73	0.75	0.78	0.81	0.84	0.86
Unincorporated portion of Rainbow Springs Group PFA						
Residential Population	9,722	9,990	10,417	10,787	11,147	11,459
Wastewater Flows (MGD)	0.73	0.75	0.78	0.81	0.83	0.86

Non-residential wastewater flows within each PFA and unincorporated PFA area were projected based on the same presumed rate of growth as the residential population growth. The total non-residential developed indoor area was summed and divided by the County population resulting in 241 square feet of non-residential square feet per capita. Similarly, the current non-residential wastewater flows were used to estimate the average wastewater flow generation resulting in 179 gallons per 1,000 square feet. Table 3-8 presents projected non-residential wastewater flows in the Silver Springs PFA and the unincorporated portion of the PFA areas. Table 3-9 presents projected non-residential wastewater flows in the Rainbow Springs Group PFA and the unincorporated portion of the PFA areas.

Table 3-8 Projected Non-Residential Population and Wastewater Flows

	2019 Estimate	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Silver Springs PFA						
Wastewater Flows (MGD)	10.27	10.71	11.36	11.91	12.44	12.90
Unincorporated Portion of Silver Springs PFA						
Wastewater Flows (MGD)	1.58	1.65	1.75	1.83	1.91	1.98

Table 3-9 Projected Non-Residential Population and Wastewater Flows

	2019 Estimate	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Rainbow Springs Group PFA						
Wastewater Flows (MGD)	0.20	0.21	0.22	0.23	0.24	0.25
Unincorporated Portion of Rainbow Springs Group PFA						
Wastewater Flows (MGD)	0.20	0.21	0.22	0.23	0.24	0.25

3.3 Restoration Project Identification, Prioritization, and Implementation

This section details the development of OSTDS remediation priority project areas (PPAs), PPA prioritization, and project implementation. Initial project recommendations, nutrient load reduction estimates, and construction cost estimates are provided for each PPA to facilitate project prioritization.

3.3.1 Project Area Identification and Census Tracts

Table 3-10 lists the 133 PPAs identified as the primary areas of focus for specific OSTDS remediation projects. These areas were developed based on OSTDS density, land use type, closeness to existing infrastructure, development potential, and stakeholder input. The table includes PPA letter identification, BMAP, PFA, number of total parcels, estimated number of parcels with OSTDSs, census tracts, and Nitrogen load. Number of parcels is from the Marion County Property Appraiser and number of septic systems is from the FLWMI database based on parcel attributes of "known septic," "likely septic," and "somewhat likely septic." An NSILT analysis was performed for each PPA to determine the estimated Nitrogen loading within each boundary measured in lb/yr; estimated Nitrogen load reduction through OSTDS remediation can be used to prioritize projects for future planning.

Figure 3-7 through Figure 3-10 present four maps showing the PPA boundaries. Appendix C presents 32 more detailed maps of the PPAs organized by a grid system. The identification of the PPAs, AA through FC, presented in Table 3-10 follows the geographic sequencing of the grid.

Table 3-10 Priority Project Areas

PPA	BMAP	PFA	# Parcels	# OSTDS	Census Tract[1]	Nitrogen Load (lb/yr)
AA	Rainbow	None	9,474	850	27.01	7,100
AB	Rainbow	Rainbow	1,377	630	27.01	5,574
AC	Rainbow	Rainbow	1,572	916	26.01	5,670
AD	Rainbow	Rainbow	1,787	368	26.01	4,234
AE	Rainbow	Rainbow	396	178	27.02	1,472
AF	Rainbow	Rainbow	1,509	925	27.01	7,935
AG	Rainbow	Rainbow	586	285	27.02	2,543
AH	Rainbow	None	273	113	27.02	1,027
AI	Rainbow	None	209	146	27.02	1,310
AJ	Rainbow	None	1,484	738	26.02	6,146
AK	Rainbow	Rainbow	5,806	763	26.01	6,309
AL	Rainbow	Rainbow	1,198	562	27.02	4,168
AM	Silver	None	419	305	2.00	3,208
AN	Silver	None	435	299	2.00	4,473
AO	Silver	None	355	205	2.00	3,568
AP	Silver	Silver	249	110	15.00	1,750
AQ	Rainbow	None	2,502	1,540	25.03	12,794

PPA	BMAP	PFA	# Parcels	# OSTDS	Census Tract[1]	Nitrogen Load (lb/yr)
AR	Rainbow	None	577	383	26.01	3,246
AS	Rainbow	None	460	440	25.03	3,656
AT	Rainbow	None	1,710	451	25.04	4,375
AU	Rainbow	None	97	72	25.02	590
AV	Rainbow	None	219	194	25.02	1,605
AW	Rainbow	None	298	271	25.02	2,236
AX	Rainbow	None	240	121	25.02	1,031
AY	Rainbow	None	125	94	10.06	918
AZ	Rainbow	None	289	226	10.06	1,879
BA	Rainbow	None	778	729	10.06	5,928
BB	Rainbow	None	897	842	26.06	7,012
BC	Rainbow	None	1,531	1,344	10.07	11,569
BD	Rainbow	None	4,735	2,993	10.07	24,576
BE	Rainbow	None	56	11	26.05	4,230
BF	None	None	23,003	4,955	10.04	49,700
BG	Silver	None	513	266	2.00	3,320
BH	Silver	None	1,500	511	4.02	2,321
BI	Silver	Silver	673	505	3.01	2,286
BJ	Silver	Silver	153	114	3.01	1,617
BK	Silver	Silver	959	712	3.02	8,702
BL	Silver	Silver	343	132	3.02	152
BM	Silver	Silver	291	57	15.00	278
BN	Silver	Silver	602	378	13.01	2,755
BO	Silver	Silver	144	125	13.01	981
BP	Silver	Silver	228	211	13.01	1,679
BQ	Silver	Silver	228	203	13.01	1,542
BR	Silver	Silver	514	459	13.01	3,723
BS	Silver	Silver	229	172	13.02	965
BT	Silver	Silver	102	84	13.01	283
BU	Silver	Silver	57	49	13.01	399
BV	Silver	Silver	346	307	13.01	1,534
BW	Silver	Silver	878	829	13.02	4,665
BX	Silver	Silver	42	40	13.02	180
BY	Silver	Silver	277	206	13.02	1,347
BZ	Silver	Silver	242	214	13.02	961
CA	Silver	Silver	160	135	14.01	617
CB	Silver	Silver	426	398	14.02	1,849
CC	Rainbow	None	106	96	25.02	781
CD	Silver	Silver	647	434	24.02	9,077

PPA	BMAP	PFA	# Parcels	# OSTDS	Census Tract[1]	Nitrogen Load (lb/yr)
CE	Silver	Silver	695	475	24.01	3,915
CF	Silver	Silver	207	167	23.01	1,389
CG	Silver	Silver	688	632	23.02	5,613
CH	Silver	Silver	115	96	22.03	790
CI	Silver	Silver	105	86	23.02	715
CJ	Silver	Silver	711	622	23.02	5,005
CK	Silver	Silver	72	67	24.02	557
CL	Silver	Silver	286	244	23.02	2,155
CM	Silver	Silver	738	678	11.03	5,520
CN	Silver	Silver	268	209	24.02	1,721
CO	Silver	Silver	209	178	24.02	1,463
CP	Silver	Silver	76	73	23.02	607
CQ	Silver	None	720	581	9.01	5,197
CR	Silver	Silver	71	63	24.02	492
CS	Silver	Silver	187	163	24.02	1,033
CT	Silver	Silver	76	47	11.04	945
CU	Silver	None	65	54	9.01	1,205
CV	Silver	None	161	106	9.01	1,409
CW	Silver	None	937	322	9.02	2,355
CX	Silver	None	3,825	1,666	9.02	9,933
CY	Silver	None	610	273	4.01	2,382
CZ	Silver	Silver	463	354	13.02	1,134
DA	Silver	Silver	149	122	13.02	318
DB	Silver	Silver	74	28	14.02	312
DC	Silver	Silver	1,046	929	22.02	6,860
DD	Silver	Silver	204	182	12.05	1,576
DE	Silver	Silver	423	328	12.05	938
DF	Silver	Silver	110	77	6.02	374
DG	Silver	Silver	70	65	22.03	553
DH	Silver	Silver	1,311	1,108	22.03	13,172
DI	Silver	Silver	1,492	1,185	12.08	10,178
DJ	Silver	Silver	29	22	11.03	431
DK	Silver	Silver	4,558	2,831	12.07	23,752
DL	Silver	Silver	4,246	1,861	12.04	16,547
DM	Silver	Silver	2,744	993	11.03	9,049
DN	Silver	Silver	451	347	11.03	2,194
DO	Silver	Silver	1,229	287	11.03	2,285
DP	Silver	Silver	2,174	184	12.06	5,915
DQ	Silver	Silver	356	80	11.04	376

PPA	BMAP	PFA	# Parcels	# OSTDS	Census Tract[1]	Nitrogen Load (lb/yr)
DR	Silver	None	170	128	12.06	1,175
DS	Silver	None	138	129	11.04	1,039
DT	Silver	Silver	143	118	11.03	644
DU	Silver	None	232	137	8.02	570
DV	Silver	None	270	14	7.01	61
DW	Silver	None	698	555	11.02	4,087
DX	Silver	None	598	490	8.02	2,699
DY	Silver	None	474	294	8.02	2,116
DZ	Silver	None	123	89	8.02	407
EA	Silver	None	211	45	8.02	243
EB	Silver	None	160	125	8.02	830
EC	Silver	None	187	162	8.02	843
ED	Silver	None	349	232	7.01	2,049
EE	Silver	None	1,106	634	7.02	3,452
EF	Silver	None	441	351	9.02	2,922
EG	Silver	None	952	759	8.02	3,883
EH	Silver	None	734	567	7.02	1,698
EI	Silver	None	2,697	1,157	8.01	7,173
EJ	Silver	None	551	467	8.01	2,306
EK	Silver	None	218	177	7.02	880
EL	Silver	None	636	568	8.01	2,626
EM	None	None	494	224	6.01	2,106
EN	Silver	None	24	10	6.02	76
EO	Silver	None	295	175	6.02	1,102
EP	Silver	None	59	39	6.02	989
EQ	None	None	2,922	2,040	6.01	20,365
ER	None	None	1,235	637	6.05	5,853
ES	None	None	446	307	6.02	2,836
ET	Silver	None	7,537	424	7.01	1,513
EU	Silver	None	630	490	7.02	1,514
EV	Silver	None	360	223	7.02	1,347
EW	Silver	None	386	240	7.02	2,190
EX	None	None	348	219	5.01	2,117
EY	None	None	416	285	5.01	2,963
EZ	None	None	373	173	5.02	1,423
FA	None	None	587	466	5.02	5,186
FB	None	None	507	271	6.05	2,688
FC	None	None	461	229	6.05	2,228

[1]Census tract based on centroid of PPA.

Figure 3-7 Northwest Marion County Priority Project Areas

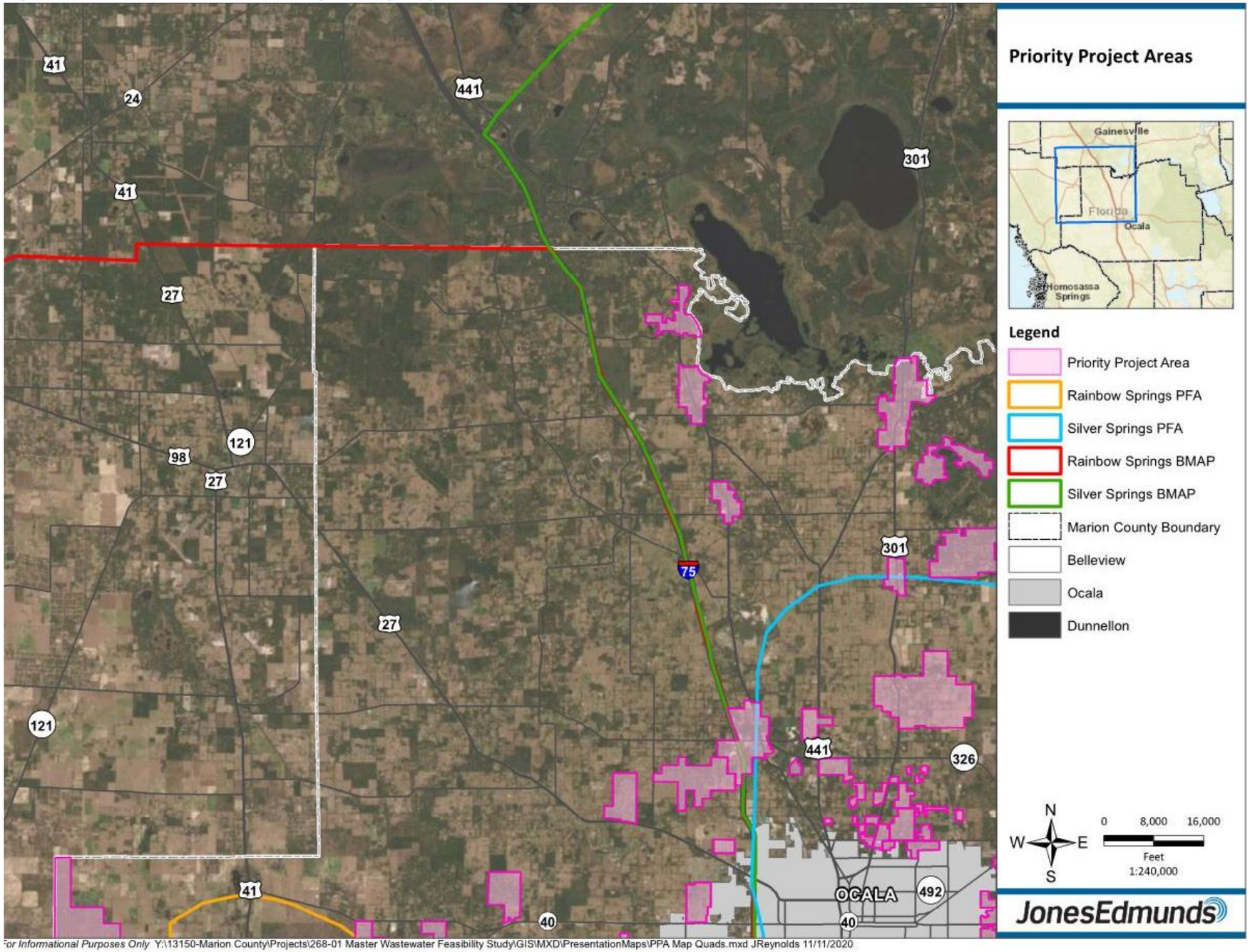


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Figure 3-8 Northeast Marion County Priority Project Areas

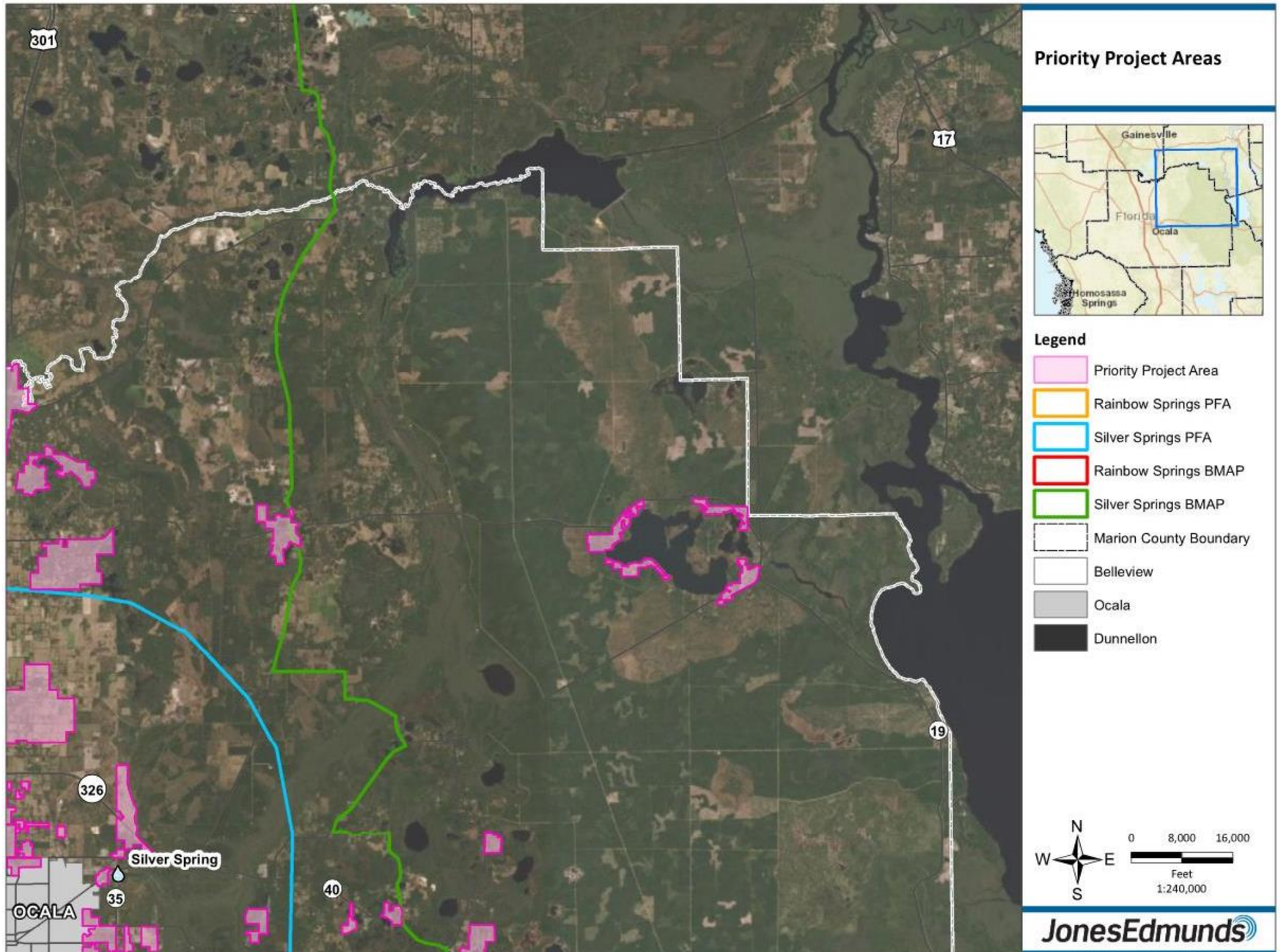

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Figure 3-9 Southwest Marion County Priority Project Areas

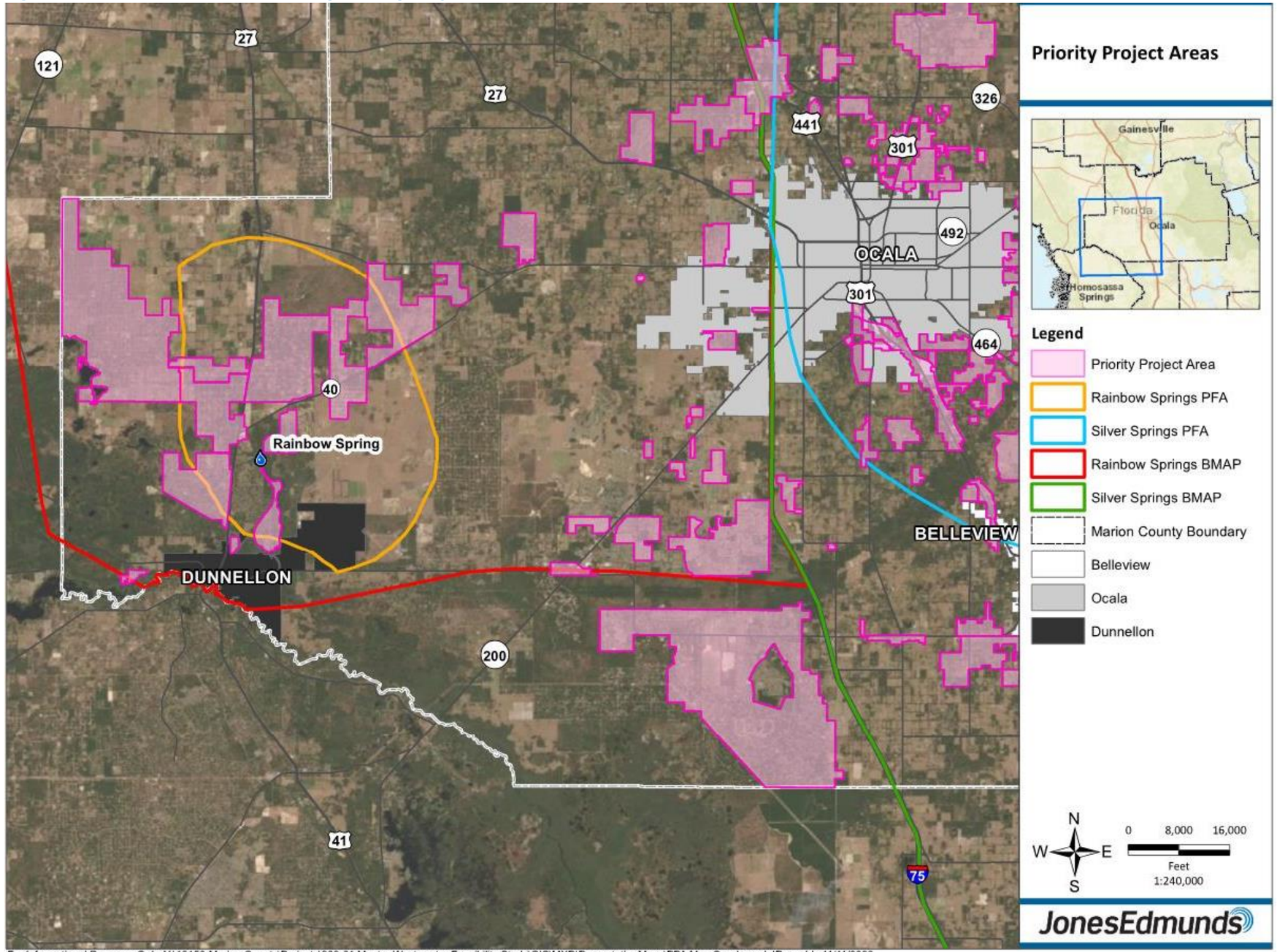

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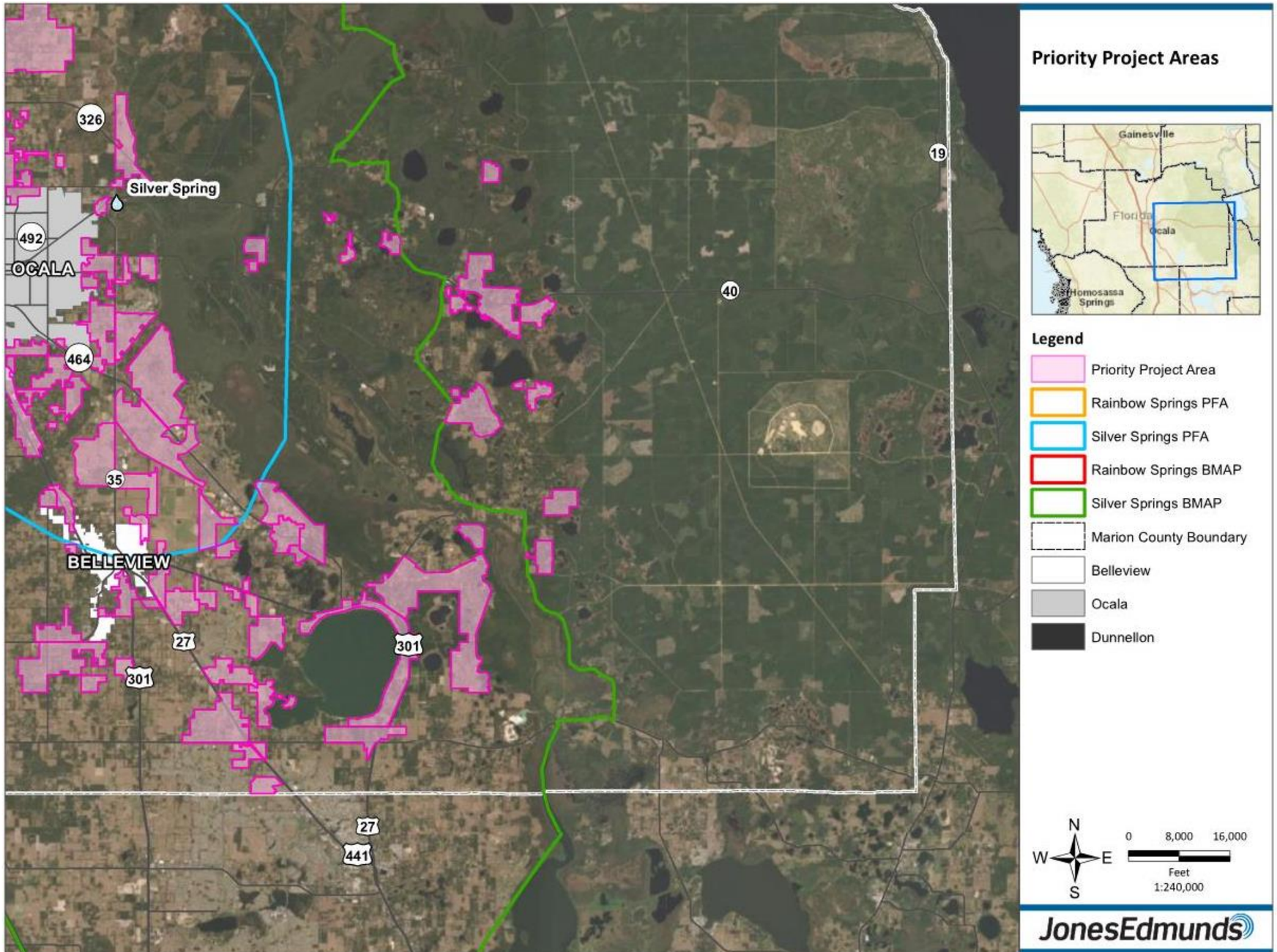
Figure 3-10 Southeast Marion County Priority Project Areas



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3.3.2 Project Area Prioritization

All 133 PPAs were individually analyzed to determine whether a gravity flow, low-pressure, or combination gravity/low-pressure system was appropriate for the site-specific conditions and to develop a high-level Engineer's Opinion of Probable Construction Cost (EOPCC). To develop the EOPCC for each PPA, the number and location of possible LSs was approximated based on the number and distribution of parcels, parcel size, and topography; collection system details were estimated using length of road within the PPA as a proxy for pipe length (adjusted to omit unnecessary pipe loops) and parcel accessibility; and transmission system details were estimated using the shortest road-distance from the PPA boundary to the nearest utility connection. Costs include septic tank abandonment. Appendix D is a detailed table highlighting PPA characteristics, costs, and conversion benefits. Detailed EOPCCs for each PPA can be found in Appendix E.

The total estimated cost to convert all identified PPAs to central sewer is $4.1 billion.

Over the 20-year planning horizon, only a limited number of S2S conversion projects can be completed due to fiscal and logistical constraints. To help identify which PPAs warrant further investigation of centralized sewer feasibility, a scoring system was developed as an evaluation tool based on key project metrics. Two formulas were created and are presented below, one for the Silver Springs BMAP area and one for the Rainbow Springs Group BMAP area:

$$Silver\ SCORE\ = (BMAP \times Silver\ Capture\ Zone \times Total\ \ N)/Cost\ per\ Parcel$$

$$Rainbow\ SCORE\ = (BMAP \times Rainbow\ PFA^{*} \times Total\ \ N)/Cost\ per\ Parcel$$

Where:

- *BMAP* denotes whether the PPA is within the BMAP boundaries. This factor captures whether a project will contribute to the BMAP goal, the eligibility of projects for certain grant funding, and relative impact to the spring. Within the BMAP boundary received a value of "1;" outside of the BMAP boundary received a value of "0."
- *Silver Capture Zone* references the 2-, 10-, 100-, and 1,000-year capture zones developed by SJRWMD. These zones are modeled groundwater contributing areas for Silver Springs and approximate the relative time for groundwater to travel to the springs; these are estimated zones and do not account for conduit flow. Figure 3-11 shows the estimated Silver Springs modeled capture zones as published in the FDEP's 2015 *Final BMAP for Silver Springs, Silver Springs Group, and Upper Silver River*. In the formula, this factor captures relative impact to the spring based on the timing of Nitrogen removal potential. Within the 2-year capture zone received a value of "2;" within the 10-year capture zone received a value of "1;" and within the 100- and 1,000-year capture zones received a value of "0."
- *Rainbow PFA* indicates whether a PPA is within the PFA boundary. This factor captures eligibility of projects for certain grant funding and relative impact to the spring. Within the PFA boundary received a value of "1;" outside of the PFA boundary received a value of "0."
  *After the Rainbow formula was developed, SWFWMD made changes to the evaluation criteria within their cost share program that expands project eligibility beyond the

Rainbow Springs PFA; however, MCUD does not currently have infrastructure in this area, and as such the formula weighting stands. This will continue to be evaluated.

- *Total N* is the total estimated Nitrogen load reduction available in the PPA as calculated with the FDEP NSILT model. This factor captures the relative Nitrogen removal benefit and impacts grant funding, project cost effectiveness, and relative impact to the spring.
- *Cost per parcel* is the approximate cost of converting a PPA from septic to centralized sewer as defined above. This factor captures the cost effectiveness of a project.

These formulas were used to score PPAs and provide guidance as to which areas may be candidates for central sewer project development and which areas may be better suited to ATUs. Additionally, proximity to existing utilities, parcel density, constructability over 20 years, County growth management strategy, and stakeholder interests were closely evaluated. Based on these analyses, five PPAs were selected for further investigation. Table 3-11 presents the selected PPAs in alphabetical order. Figure 3-12 is a map of the selected PPAs.

Table 3-11 Priority Project Areas Selected for Further Investigation

PPA	BMAP	PFA	# Parcels	# OSTDS	Census Tract	Nitrogen Load (lb/yr)	EOPCC
DC	Silver	Silver	1,046	929	22.02	6,860	$33,757,000
DH	Silver	Silver	1,311	1,108	22.03	13,172	$41,557,000
DI	Silver	Silver	1,492	1,185	12.08	10,178	$37,022,000
DK	Silver	Silver	4,558	2,831	12.07	23,752	$117,920,000
DL	Silver	Silver	4,246	1,861	12.04	16,547	$105,240,000
	Total		*12,653*	*7,914*		*70,509*	*$335,496,000*

[1]Census tract based on centroid of PPA.

Figure 3-11 SJRWMD Estimated Silver Springs Modeled Capture Zones

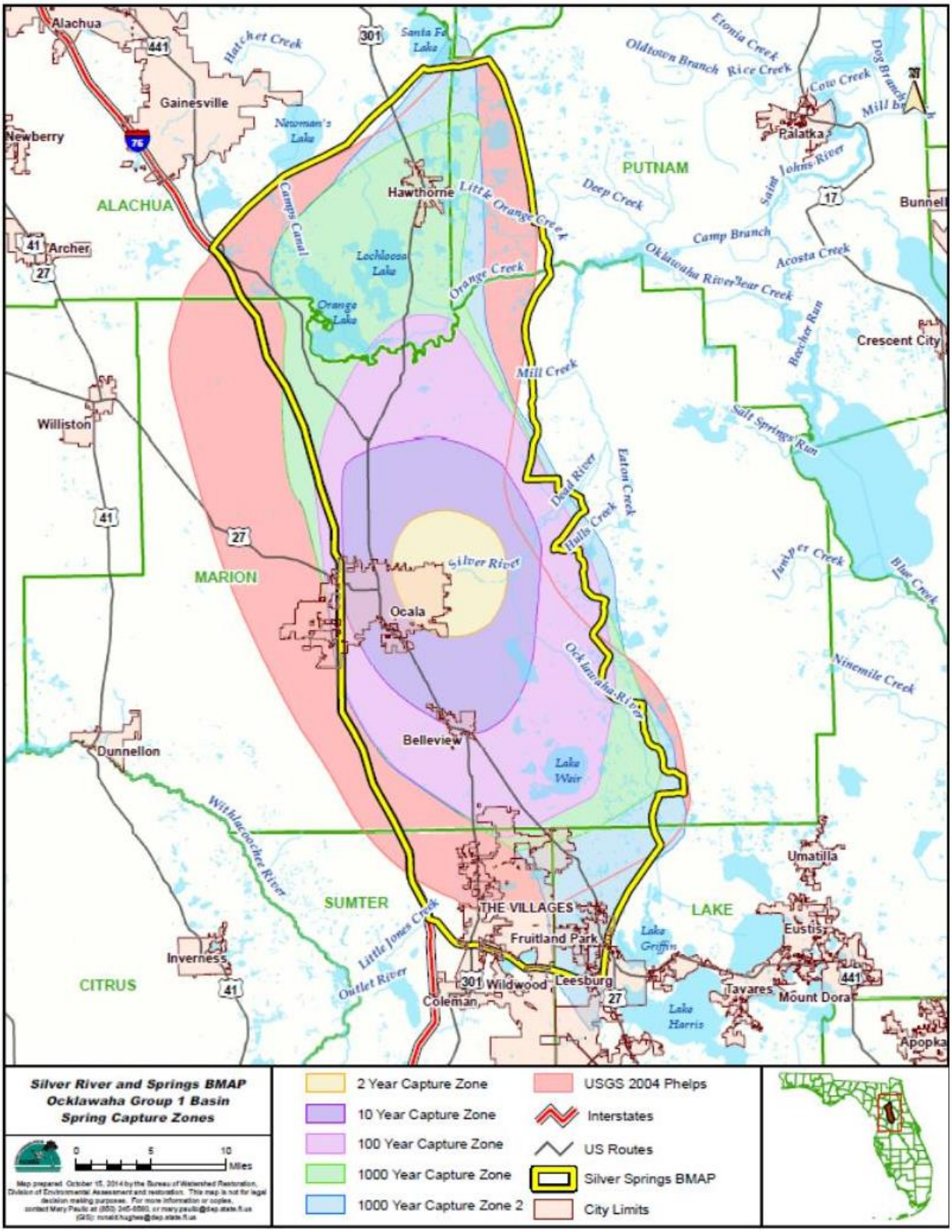
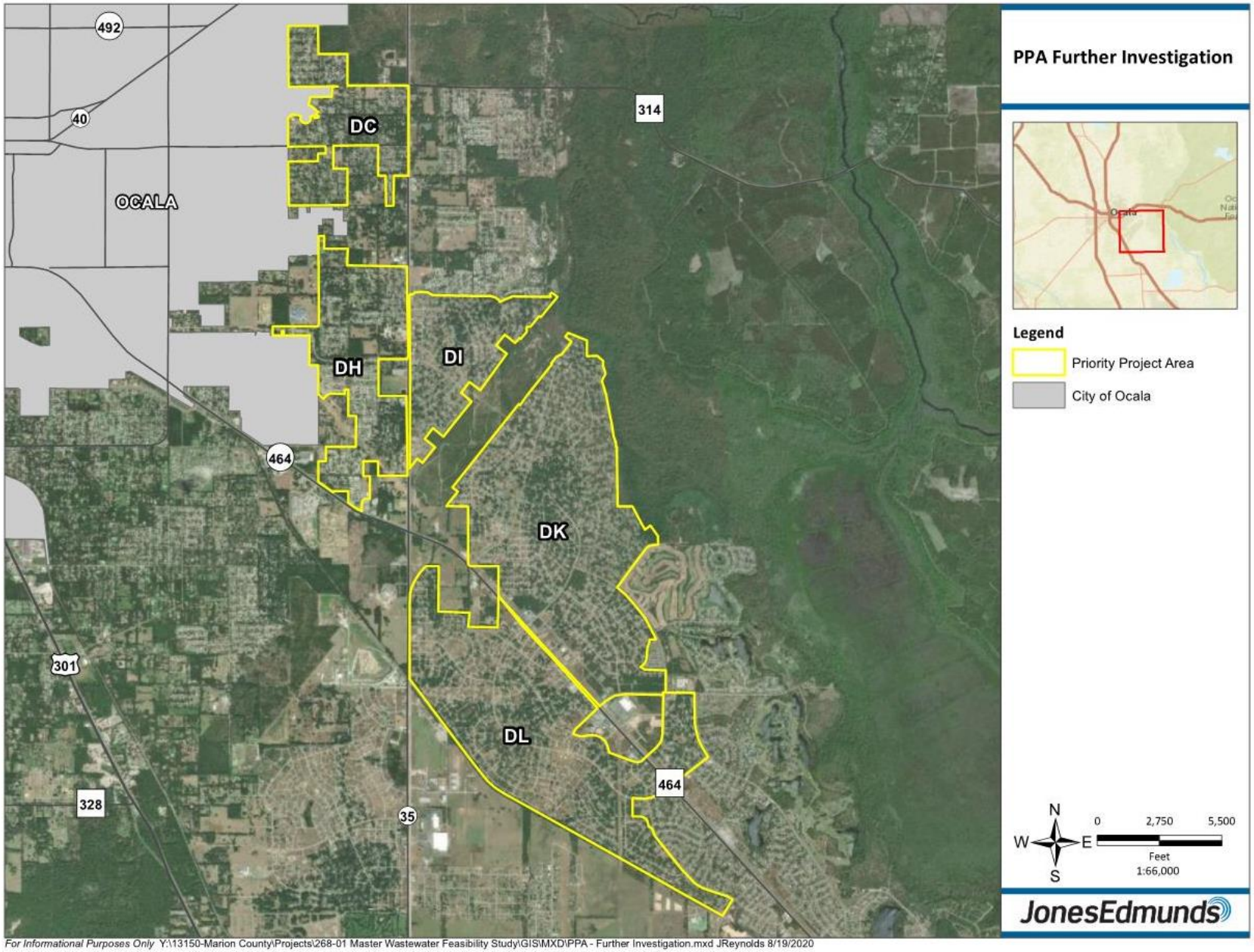


Figure 3-12 Priority Project Areas Selected for Further Investigation



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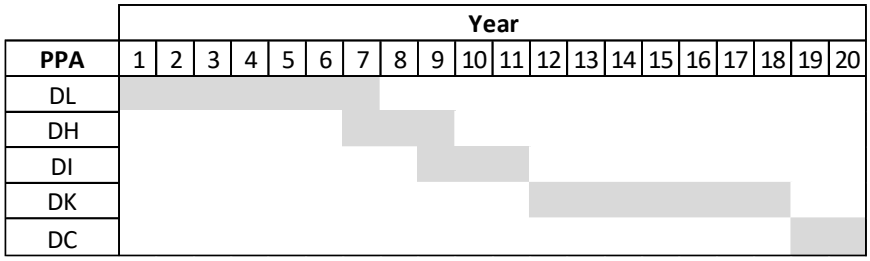
3.3.3 Project Area Implementation

The five selected PPAs should be further investigated for development into S2S conversion projects to be implemented over the 20-year planning horizon. Figure 3-13 presents a proposed project phasing plan based on project prioritization scores, high to low, calculated in Section 3.3.2. Implementation of all five selected PPA projects within 20 years is a rate of approximately 650 S2S conversions per year – an aggressive and challenging rate to meet. The Board of County Commissioners has recommended MCUD begin with a pilot project encompassing approximately 100 parcels.

To meet the requirements of the BMAP it should be assumed that the remaining 128 PPAs should be converted to ATUs within the 20-year planning period.

Figure 3-13 Proposed Project Phasing Plan*



*Phasing based on connection rate of approximately 650 parcels per year.

The Nitrogen reduction required to meet the TMDL at all spring vents for Silver Springs is listed in the BMAP as 930,135 lb-N/yr; OSTDS represent 29% of that required load reduction, or 269,739 lb-N/yr. The Nitrogen reduction required to meet the TMDL at all spring vents for the Rainbow Springs Group is listed in the BMAP as 1,783,607 lb-N/yr; OSTDS represent 20% of that required load reduction, or 356,721 lb-N/yr. The total Nitrogen reduction required to meet the TMDL between both BMAP areas is 2,713,742 lb-N/yr; OSTDS represent 626,460 lb-N/yr of that total required load reduction.

Per FDEP, ATU conversion is estimated to reduce Nitrogen loading by approximately 65 percent; central sewer conversion is estimated to reduce Nitrogen loading by approximately 95 percent. Implementation of the five selected S2S PPAs will yield an estimated Nitrogen reduction of 70,509 lb-N/yr area and ATU conversation within the other 128 PPAs will yield an additional Nitrogen reduction of approximately 213,859 lb-N/yr; the total Nitrogen reduction from all PPAs within the BMAP boundary is approximately 284,368 lb-N/yr. Table 3-12 shows the estimated Nitrogen load reduction per BMAP and PFA within the PPAs.

Table 3-12 Projected Nitrogen Load Reduction within PPAs

PPA	Projected Credit (lb-N/yr)	
	BMAP	PFA
Rainbow	90,943	24,637
Silver	193,425	135,470
Total BMAP Reduction	284,368	–
Reduction Outside BMAP	63,351	–
Total Reduction	347,719	–

If every remaining septic system in the County were converted to ATU, the total estimated Nitrogen load reduction outside of the PPAs would be approximately 273,000 lb-N/yr; within the BMAPs, the total estimated Nitrogen load reduction outside of the PPAs would be approximately 223,600 lb-N/yr. If all these measures were implemented, the total Nitrogen reduction within the BMAP boundary would be approximately 507,968 lb-N/yr, which is less than the stated Nitrogen reduction goal from OSTDS within the BMAP.

4 SEWER COLLECTION AND TRANSMISSION SYSTEM EVALUATION

MCUD provides wastewater service to nearly 30,000 customers through a network of collection and transmission systems. This chapter presents an overview of the existing MCUD collection and transmission systems, lists the County's ongoing improvements, and details the infrastructure required to convey wastewater flows under the 5-year improvement plan.

As part of the master planning effort, Jones Edmunds developed hydraulic models to predict system growth and infrastructure needs throughout the County's collection and transmission systems. The models incorporate the County's ongoing improvements and the future project areas identified in this chapter.

4.1 EXISTING SYSTEM CAPACITY

Figure 4-1 provides an overview of the MCUD wastewater system. Wastewater collected from commercial and residential customers within the MCUD service area flows through approximately 230 miles of gravity mains to over 170 pump stations then through approximately 135 miles of force mains to one of five WWTFs.

4.1.1 LS CAPACITY AND CONDITIONS

Based on input from the County, 26 pump stations were selected for pump testing and inspections. Between April 28, 2020 and May 7, 2020, each station was visually inspected to assess the current condition. Drawdown testing was performed, and the results were summarized, graphed, and compared to the manufacturer's pump curves. Table 4-1 represents a summary of the drawdown testing. Appendix F contains the complete drawdown test dataset. Overall, Jones Edmunds determined the pump stations to be in good operating condition with most pumps operating within 10 percent of the manufacturer's curve.

Figure 4-1 MCUD Sewer System Schematic

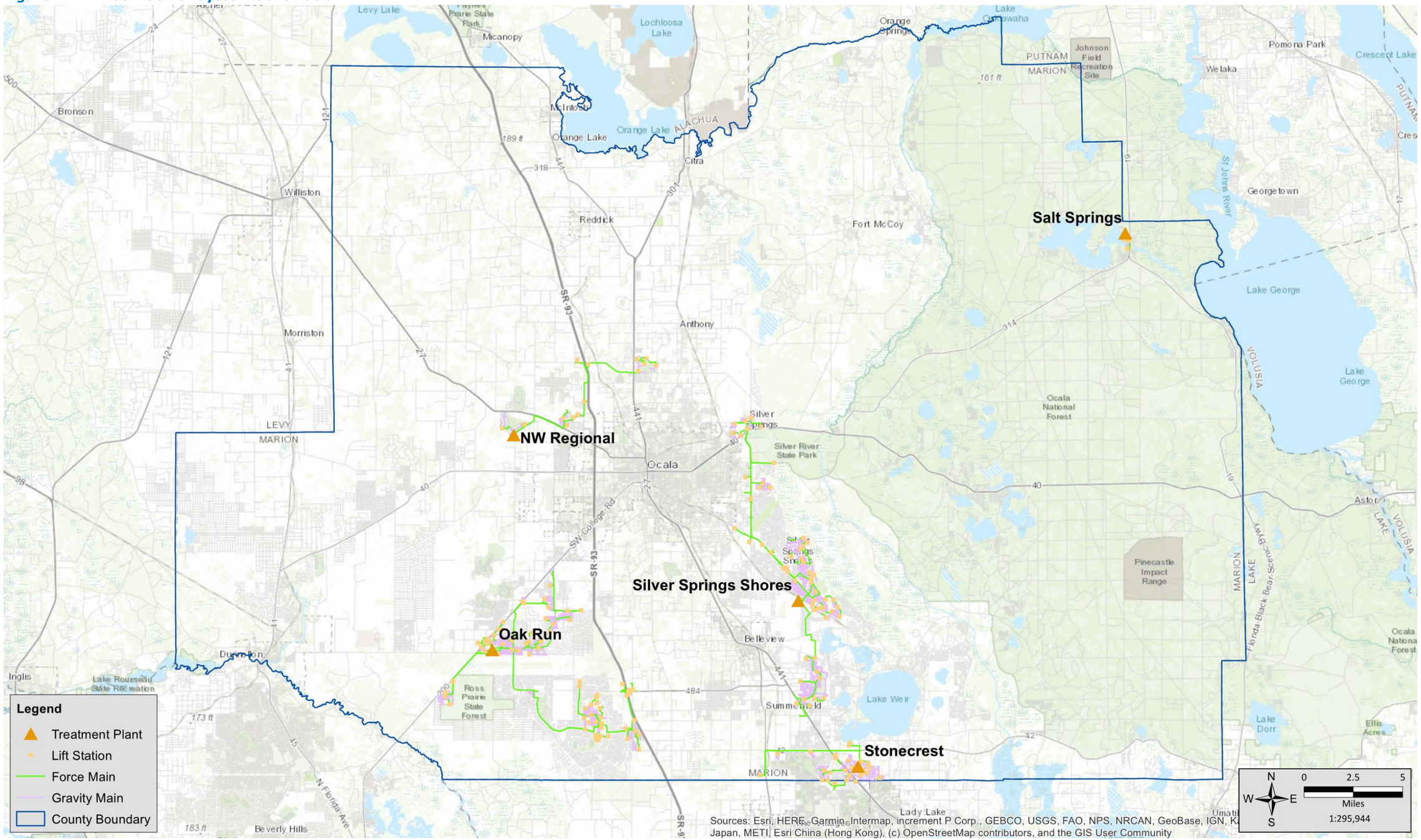


Table 4-1 Summary of Lift Station Drawdown Testing

WWTF Service Area	LS Name	Average Flow (gpm)	Average Head (ft)	Impeller Wear
Silver Springs Shores	FHS-002	610	50.3	Moderate
Silver Springs Shores	GCC-001	407	71.6	None
Silver Springs Shores	GCC-006	235	78.1	Slight
Silver Springs Shores	GCC-008	501	63.0	Slight
Silver Springs Shores	SSS-032	294	107.1	Moderate
Silver Springs Shores	SSS-046	430	79.5	None
Silver Springs Shores	TRI-001	675	112.2	Slight
Silver Springs Shores	WMT-002	530	56.5	Slight
NW Regional	ASH-002	360	103.9	Slight
NW Regional	ASH-003	270	99.2	None
NW Regional	ASH-005	525	124.0	Slight
NW Regional	KUN-002	238	78.2	None
NW Regional	PLT-001	546	63.1	None
Oak Run	SCP-004	319	135.6	Slight
Oak Run	OKR-008	636	81.8	Slight
Oak Run	SMG-009	423	62.0	Slight
Oak Run	MOK-002	595	125.0	Slight
Oak Run	OKR-012	39	37.1	Moderate
Oak Run	ORB-001	141	102.0	None
Oak Run	SMG-008	313	82.7	Slight
Stonecrest	STC-001	321	102.0	None
Stonecrest	TCR-001	119	170.4	None
Stonecrest	STC-012	306	149.3	None
Stonecrest	STC-004	181	94.2	None
Stonecrest	SCS-001	118	68.3	None
Stonecrest	LOH-002	57	85.5	Slight
Stonecrest	SCS-003	188	68.2	Slight

Note: Slight wear represents 90 to 99 percent of original performance; moderate represents 80 to 89 percent.

4.1.2 Ongoing Improvements

MCUD has two ongoing improvement projects that will increase flow capacity and reduce pumping requirements at LSs. These projects were included in the model as provided by the County to avoid redundant CIP recommendations. Figure 4-2 shows the ongoing improvements in the MCUD wastewater collection and transmission system, which include the following:

- 13,600 linear feet (LF) of 12-inch force main along US Highway 441 from County Road 42 to Del Webb Boulevard.
- 11,000 LF of 12-inch force main along SR 200 from 95th Street to SW 73rd Street Road.

- 6,500 LF of 8-inch force main along SW 80th Street and SW 76th Avenue.
- 5,400 LF of 12-inch FM along SW 49th Avenue from SW 95th Street to SW 80th Street.
- Pump upgrades, storage improvement, and the addition of VFDs at LS GCC-008.
- Maricamp Road Phase III – 1,500 LF of 8-inch force main and 8,600 LF of 16-inch force main.

4.2 System Modeling Summary

Hydraulic wastewater models are typically composed of a detailed model network that includes LSs, force mains, and gravity mains to simulate flow conveyance throughout the collection and transmission system. These types of models can be used for various purposes depending on the level of correlation to actual network supervisory control and data acquisition (SCADA) data.

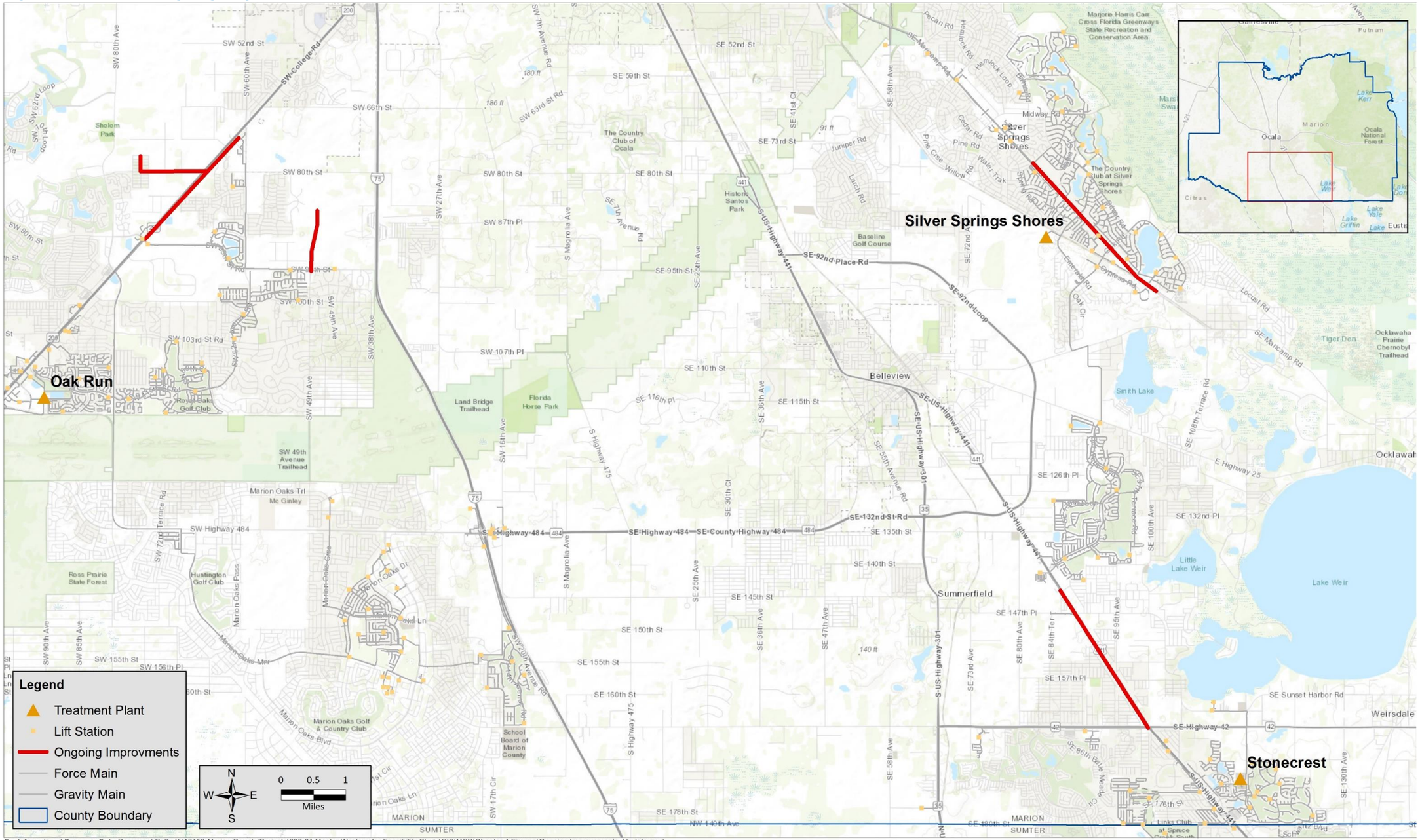
Jones Edmunds created an extended period simulation (EPS) hydraulic model for the MCUD wastewater system using the Innovyze InfoSWMM software package. The EPS model simulates a 24-hour period and shows how the system responds to different loadings. The model was set up with an ADF scenario and a MDF scenario. After calibrating these scenarios to SCADA, future scenarios were developed for 5-, 10-, 15-, and 20-year development to determine additional infrastructure requirements for the wastewater collection and conveyance systems for each planning period.

4.2.1 Calibration

To create EPS scenarios representative of the actual wastewater hydraulic network, we implemented the following steps:

- Collected recent WWTF flow data, pump runtime, and pump performance affinity curves for drawdown data.
- Compared modeled runtime data with collected pump runtime data.
- Made minor adjustments to influent sanitary flows, pump curves, and pipe roughness coefficients until the model nearly matched the collected data. The range of adjustment values is presented in Section 4.2.1.2.

Figure 4-2 MCUD Ongoing Improvements



4.2.1.1 DMR, Flow, and Runtime Data

Jones Edmunds collected the most recent 12 months of DMR data and reviewed the existing wastewater flows. Using the DMR data, we selected 3 annual average day flow (AADF) (11/29/18, 3/17/19, and 5/11/19) and 3 MDF days (12/14/18, 1/27/19, and 4/4/19) to field verify the EPS model. Operations staff provided the effluent flow meter data from the treatment facility for the 6 selected days. We used these data to create two diurnal curves for a single representative ADF and MDF and input them as a normalized pattern to distribute the flows throughout the 24-hour simulations. Appendix G provides the selected WWTF diurnal flows.

4.2.1.2 ADF Calibration

Jones Edmunds compared the SCADA pump runtime provided for three ADF days to the initial modeled runtime and made one or more of the following adjustments at each LS to match the SCADA runtime and model the predicted pump runtime:

- Adjusted pump curves using the affinity law to reduce pump efficiency:
  - Pump curve adjustments ranged from 70 to 100 percent to simulate wear on the pumps.
- Adjusted the Hazen-Williams roughness coefficient to simulate aging in the force mains:
  - Most pipe coefficients ranged from 120 to 150.
  - Old pipes or pipes with low velocities ranged from 70 to 120.
- Added or removed predicted flows from LS wet wells to better match runtimes:
  - Total sewershed sanitary flows remained constant, but individual flows were shifted at each lift station to achieve runtimes within 10 percent or 10 minutes of the provided SCADA runtime data.

The pump performance curves and Hazen-Williams roughness coefficients for force mains were adjusted to allow the modeled pump flows and head conditions to match the drawdown test data. The flows to the LSs were also adjusted to allow the modeled pump runtime to match the SCADA collected pump runtimes.

In the ADF scenario, the LSs have a model-predicted pump runtime within 10 percent or 10 minutes of the recorded SCADA runtime. The ADF calibration scenario is calibrated to the average day for each independent sewershed.

4.2.1.3 MDF Calibration

After we calibrated the model for ADF, inflows were added to LS wet wells (where needed) to match MDF SCADA pump runtime data. In the MDF scenario, the LSs have a model-predicted pump runtime within 5 percent of the recorded SCADA runtime.

4.2.2 Hydraulic Model Updates

As part of the Master Wastewater Feasibility analysis effort, MCUD's hydraulic models were updated to reflect ongoing improvement projects in the planning, designing, and

construction phases. A workshop was held with MCUD staff to review the model updates and to verify the model representation before future system improvements were considered. Pump definition names in the existing models were also updated to include current pump information such as pump make, model, and impeller specifications. Pump curves were updated based on drawdown tests performed in the field.

4.2.3 Hydraulic Modeling Assumptions and Evaluation Criteria

4.2.3.1 Average and Maximum Daily Flows

Modeling simulations used a maximum day level of service value of 273 gpd per residential connection based on WWTF DMRs to account for variations in customer water use and to provide adequate transmission capacity throughout the service areas. We determined the actual AADF for the service area to be 186 gpd per residential connection based on County data. We determined peaking factors for each WWTF, which we used for modeling maximum daily EPSs that included peak hourly flows (PHFs).

4.2.3.2 Evaluation Criteria

Jones Edmunds used the wastewater hydraulic models to evaluate the existing wastewater system performance under the current, 5-, 10-, 15-, and 20-year flow scenarios. The evaluation criteria for establishing wastewater collection system performance included:

- System capacity was determined adequate if a stand-by pump was not needed to transmit the flow under the modeled scenario.
- Force main headlosses were considered sufficient if the maximum headloss did not exceed the force main operating guideline of one-foot loss per 100 feet of pipe.

If the evaluation criteria were not met, we identified system improvements for each flow scenario.

4.2.4 Current System Improvements

The model suggests that no improvements are immediately needed aside from the current improvements listed in Section 4.3.

4.3 Future Growth and Expansion Alternatives

4.3.1 Future Flows in Existing Sewersheds

Table 4-2 lists the future flows in each sewershed based on the population projections. Silver Springs Shores includes the future flows from the S2S conversion projects in the five selected PPAs. The phasing of the sewer conversion flow projections is based on an aggressive estimate of 650 parcels connected per year. Chapter 5 presents a capacity analysis of the Silver Springs Shores additional project flows over the next 20 years.

Table 4-2 Summary of Future Modeled Flows

WWTF Service Area	Permitted Capacity (GPD)	Current Flows (GPD)	Additional Projected Flows (GPD)			
		2019	2025	2030	2035	2040
NW Regional	200,000	64,000	6,900	5,900	5,700	5,000
Oak Run	1,600,000	879,000	39,300	34,300	32,600	24,500
Silver Springs Shores	2,000,000	1,292,000	432,800	723,400	685,000	567,100
Stonecrest	1,000,000	193,000	156,300	5,400	5,600	5,400

Note: Current flows are for the model calibrated dates. All future flows are the difference from the previous modeled 5-year period.

4.3.2 S2S Project Areas

As identified in Section 3.3.2, five PPAs are recommended for further investigation and development of S2S projects: DC, DH, DI, DK, and DL. A recommended phasing plan over the 20-year planning horizon was presented in Section 3.3.3. Table 4-2 shows that each of the five recommended PPA projects would collect and transmit wastewater for treatment at the Silver Springs Shores WRF.

4.3.3 5-Year Improvement Plan

The 5-year improvement plan includes a pilot project and Phase 1 of the DL PPA S2S conversion project – including approximately 3,250 lots, 8 lift stations, and associated gravity collection system and transmission force main within the PPA – in the Silver Springs Shores WRF service area.

4.3.3.1 Silver Springs Shores WRF 5-Year Model Results and Improvements

Modeling results indicate that one improvement will be necessary to convey the projected flows for the Silver Springs Shores WRF service area under the 5-year improvement plan:

- Upgrade at SSS-032 to increase volume of storage in the wet well and construct a short tie-in FM to bypass FHS-002 and send flow directly to EQB-001.

4.3.4 10-Year Improvement Plan

The 10-year improvement plan includes Phase 2 of the DL PPA S2S conversion project, including approximately 1,000 lots and five lift stations; the DH PPA S2S conversion project, including approximately 1,300 lots and five lift stations; Phase 1 of the DI PPA S2S conversion project, including approximately 950 lots and two lift stations; and associated gravity collection system and transmission force main within the PPAs in the Silver Springs Shores WRF service area.

4.3.4.1 Silver Springs Shores WRF 10-Year Model Results and Improvements

Modeling results indicate that the following improvements will be necessary to convey the projected flows for the Silver Springs Shores WRF service area under the 10-year improvement plan:

- A bypass force main to avoid the north Silver Springs sewershed from being repumped by EQB-001 is a solution to the repump problem in that area that requires:
  - 5,500 LF of 16-inch force main along Maricamp Road connecting the existing 16-inch force main to the Silver Springs Shores WRF.
  - Pump upgrades are proposed due to increased head conditions from the new bypass, changing the discharge location from the EQB to the Silver Springs Shores WRF:
    - Pump modification at LS FHS-002 to a higher head, potentially lower-flow pump.
    - Pump upgrade at LS CAS-001 to a higher-head pump.
    - Pump upgrade at LS FHS-001 to a higher-head pump.
    - Pump upgrade at LS SSS-009 to a higher-head pump.
    - Pump upgrade at LS SSS-025 to a higher-head pump.
    - Pump upgrade at LS SSS-032 to a higher-head pump.
    - Pump upgrade at LS WMT-002 to a higher-head pump.
  - Pump upgrades would not be required for the following pumps if the 12-inch force main to EQB-001 remains active:
    - SSS-009.
    - SSS-025.
    - WMT-002.

4.3.5 15-Year Improvement Plan

The 15-year improvement plan includes Phase 2 of the DI PPA S2S conversion project, including approximately 550 lots and two lift stations; Phase 1 of the DK PPA S2S conversion project, including approximately 2,700 lots and nine lift stations; and associated gravity collection system and transmission force main within the PPAs in the Silver Springs Shores WRF service area.

4.3.5.1 Silver Springs Shores WRF 15-Year Model Results and Improvements

Modeling results indicate that the following improvements will be necessary to convey the projected flows for the Silver Springs Shores WRF service area under the 15-year improvement plan:

- Upgrade approximately 5,200 LF of 8-inch FM along SE 58th Avenue, from the new DI PPA S2S conversion project point of connection to the existing 12-inch-diameter force main on Maricamp Road, to handle additional flows from the DH PPA and DI PPA S2S conversion projects.

4.3.6 20-Year Improvement Plan

The 20-year improvement plan includes Phase 2 of the DK PPA S2S conversion project, including approximately 1,800 lots and four lift stations; the DC PPA S2S conversion project, including approximately 1,000 lots and five lift stations; and associated gravity collection

system and transmission force main within the PPAs in the Silver Springs Shores WRF service area.

4.3.6.1 Silver Springs Shores WRF 20-Year Model Results and Improvements

Modeling results indicate that if the recommended improvements in the 5-, 10-, and 15-year improvement plans are implemented no additional improvements will be necessary to convey the projected flows for the Silver Springs Shores WRF service area under the 20-year improvement plan.

4.4 Cost Estimates of Recommended Improvements

Jones Edmunds developed an Engineer's Opinion of Probable Construction Cost (EOPCC) based on the conceptual layout of each proposed project within the improvement plans. These cost opinions do not include the use of Davis-Bacon rates, capitalized interest, or inflation.

The cost opinions' accuracy range depends on the level of design completed according to the Association for the Advancement of Cost Engineering International's Cost Estimate Classification System (Recommended Practice No. 18R-97). The classifications depend on the level of project definition, with Class 1 being the highest level of definition and Class 5 being the lowest level of definition. A feasibility analysis for CIP projects is defined as Class 4, with a range of accuracy of -20 to +30 percent. The EOPCCs were developed as a budgetary opinion of probable cost for each project.

Costs estimates are provided in Chapter 10.

5 WWTF CAPACITY ASSESSMENT

MCUD has five WWTFs: Northwest Regional (formerly Golden Ocala), Oak Run, Salt Springs, Silver Springs Shores (formerly Emerald), and Stonecrest. This chapter presents an overview of the existing flows and loads and projected flows and load for each WWTF impacted by the recommended improvements identified in Chapter 4. Based on the existing and projected flows and loads, the need for WWTF expansions and/or new WWTFs over the 20-year planning horizon was assessed along with the timing and estimated cost of needed improvements.

5.1 Existing Flows and Loads

Historic influent flow data was obtained from the discharge monitoring reports (DMRs) for the period between January 2015 and December 2019 for the Northwest Regional, Oak Run, Salt Springs, Silver Springs Shores, and Stonecrest WWTFs. The following historical flow patterns were investigated as outlined in Chapter 62-600, FAC:

- Annual Average Daily Flow (AADF).
- Maximum Monthly Average Daily Flow (MMADF).
- Maximum Three-Month Average Daily Flow (M3MADF).
- Peak Day Flow (PDF).
- Minimum Daily Flow (MinDF).

5.1.1 Northwest Regional WWTF

The Northwest Regional WWTF (Facility Id: FLA272060) is a 0.200 MGD AADF permitted capacity extended aeration domestic wastewater treatment plant. The total flow through the WWTF is metered at monitoring site number FLW-3. Water quality sampling is conducted at monitoring site number EFA-1. Figure 5-1 shows that the rolling average AADF at the Northwest Regional WWTF was consistently below the permitted limit of 0.200 MGD from January 2015 through December 2019. The elevated daily flow in January 2015 (~0.61 MGD) is an anomaly and may be an input error on the DMR. Table 5-1 shows the annual summary of flow patterns from 2015 through 2019.

Figure 5-2, Figure 5-3, and Figure 5-4 depict the effluent Total Nitrogen (TN) concentration, and influent concentration and mass loading for both 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) and Total Suspended Solids (TSS). The single samples for effluent TN, influent $CBOD_5$, and influent TSS concentrations are collected bi-weekly per the operating permit.

The Northwest Regional WWTF is undergoing updates and modifications to accommodate increased flow, improve effluent quality, and to ensure compliance with the TN limits associated with the BMAP. When modifications are complete, the final permit limits for effluent TN concentration in a single sample will be 6.0 mg/L for the sprayfield and 10.0 mg/L for public access reuse; the previous permit did not include TN limits and in the interim there are no set limits. Sampled effluent TN concentrations ranged from a minimum of 24 mg/L in March 2018 to a maximum of 73 mg/L in December 2015. The average TN

concentration was 47.4 mg/L over the 5-year monitoring period. No obvious increasing or decreasing trends occur in the effluent TN concentrations.

Figure 5-1 Influent Flows at Northwest Regional WWTF from 2015 to 2019

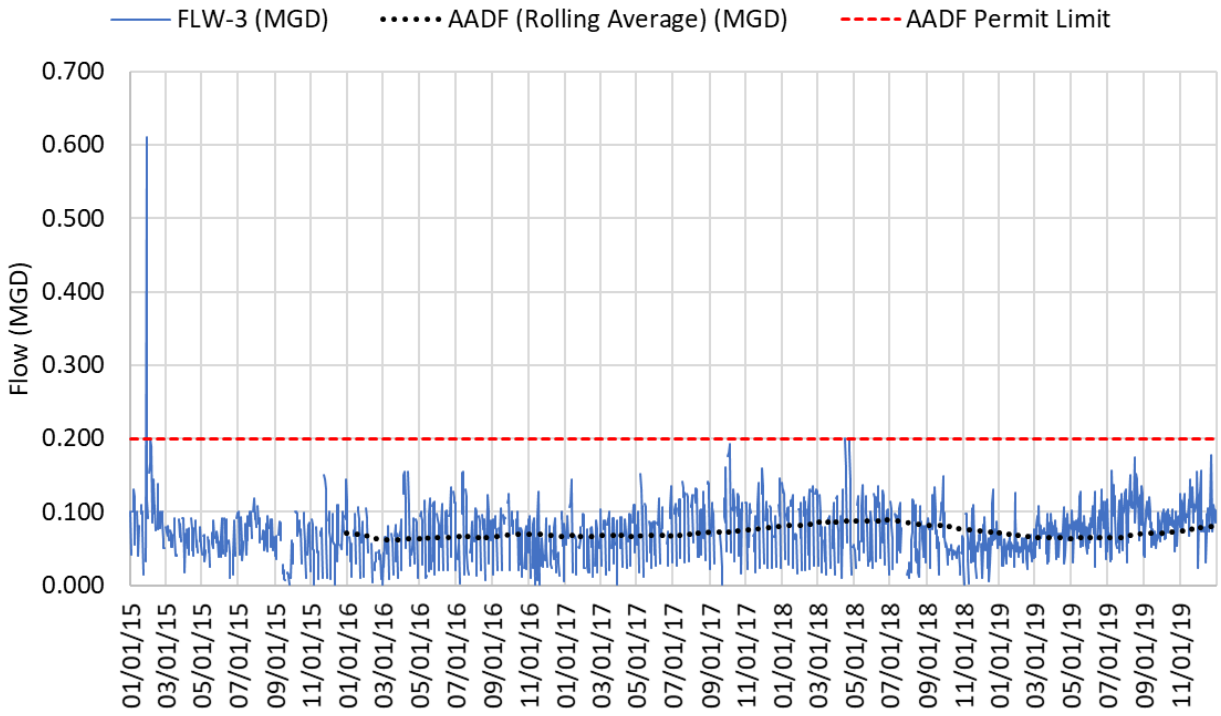


Table 5-1 Northwest Regional WWTF Annual Flows Summary (2015-2019)

Year	AADF (MGD)	MMADF (MGD)	M3MADF (MGD)	PDF (MGD)	MinDF (MGD)
2015	0.051	0.076	0.067	0.610	0.001
2016	0.046	0.062	0.057	0.155	0.001
2017	0.055	0.074	0.064	0.193	0.001
2018	0.057	0.075	0.061	0.200	0.001
2019	0.080	0.111	0.095	0.177	0.022

Figure 5-2 Effluent TN at the Northwest Regional WWTF from 2015 to 2019

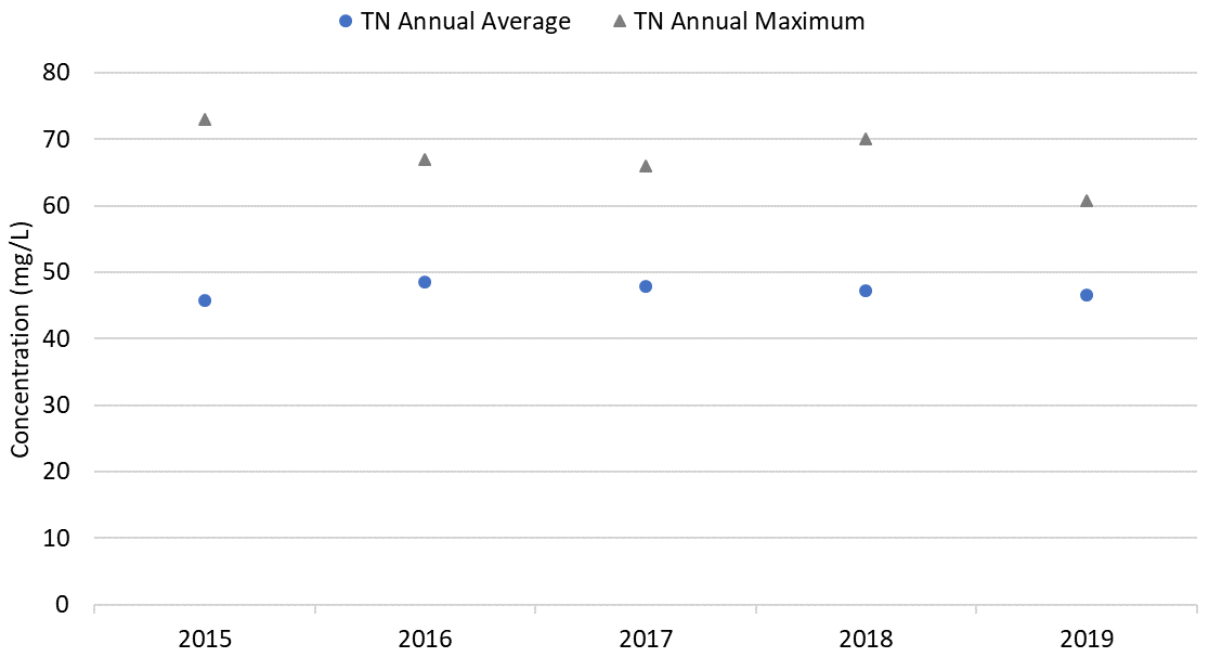


Figure 5-3 Influent $CBOD_5$ at the Northwest Regional WWTF from 2015 to 2019

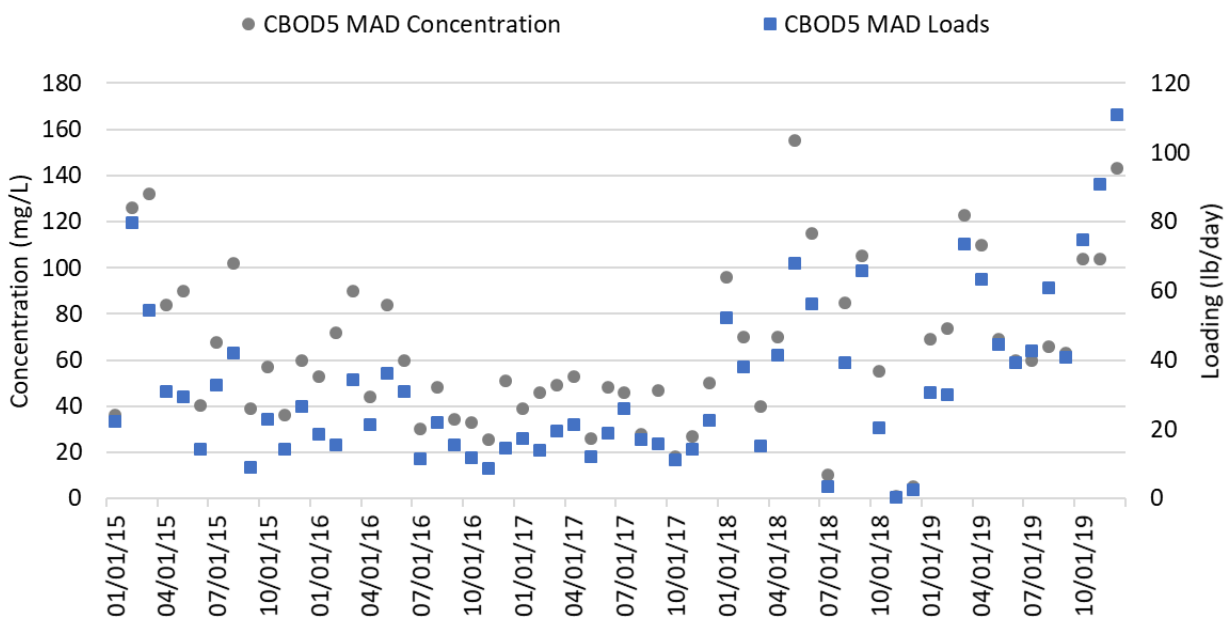
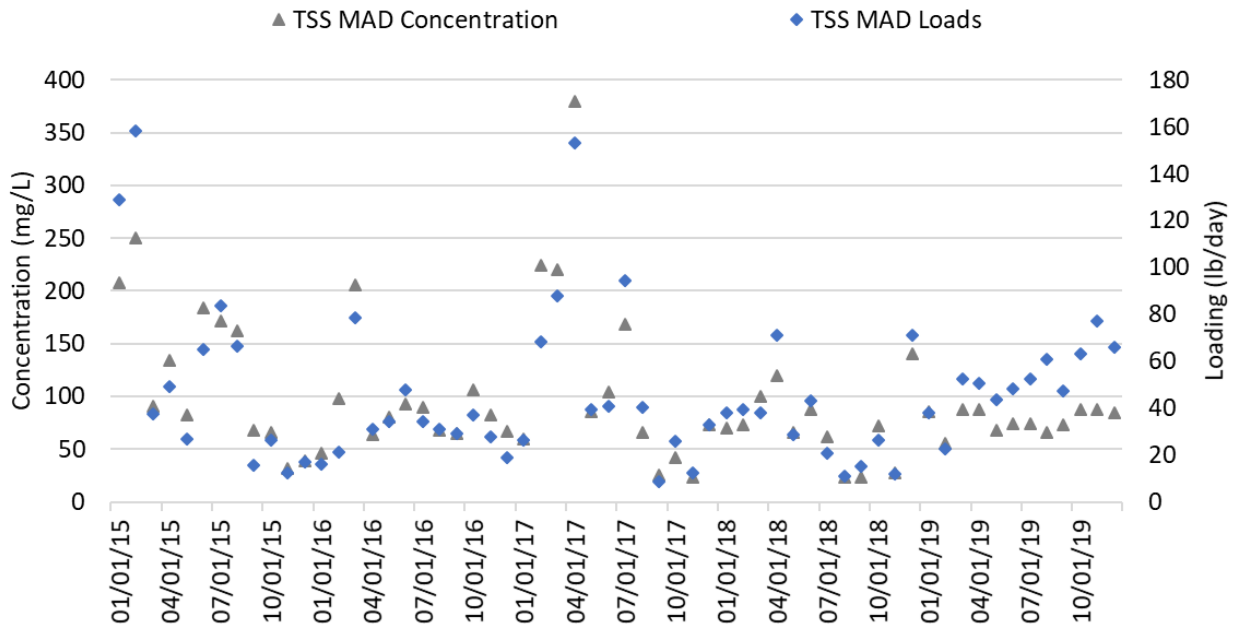


Figure 5-4 Influent TSS at the Northwest Regional WWTF from 2015 to 2019



Influent $CBOD_5$ concentrations ranged from a minimum of 1.0 mg/L in November 2018 to a maximum of 155 mg/L in May 2018. The average $CBOD_5$ concentration over the 5-year monitoring period was 64 mg/L. This average concentration is below the typical $CBOD_5$ range of 110 to 350 mg/L for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). A slight upward trend occurs in the influent $CBOD_5$ concentration.

Influent TSS concentrations ranged from a minimum of 24 mg/L in November 2017, August 2018, and September 2018 to a maximum of 380 mg/L in April 2017. The average TSS concentration over the 5-year monitoring period was 97 mg/L, which is below the typical range of 120 to 400 mg/L TSS for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). No obvious increasing or decreasing trends occur in the influent TSS concentration.

5.1.2 Oak Run WWTF

The Oak Run WWTF (Facility ID: FLA012697) is a 1.6-MGD-AADF biological nutrient removal domestic wastewater treatment plant. The total flow through the WWTF is metered at monitoring site number FLW-1. Water quality sampling is conducted at monitoring site number EFA-1. Figure 5-5 shows that the rolling average AADF at the Oak Run WWTF was consistently below the permitted limit of 1.6 MGD from January 2015 through December 2019. Table 5-2 shows the annual summary of flow patterns from 2015 through 2019.

Figure 5-5 Influent Flows at the Oak Run WWTF from 2015 to 2019

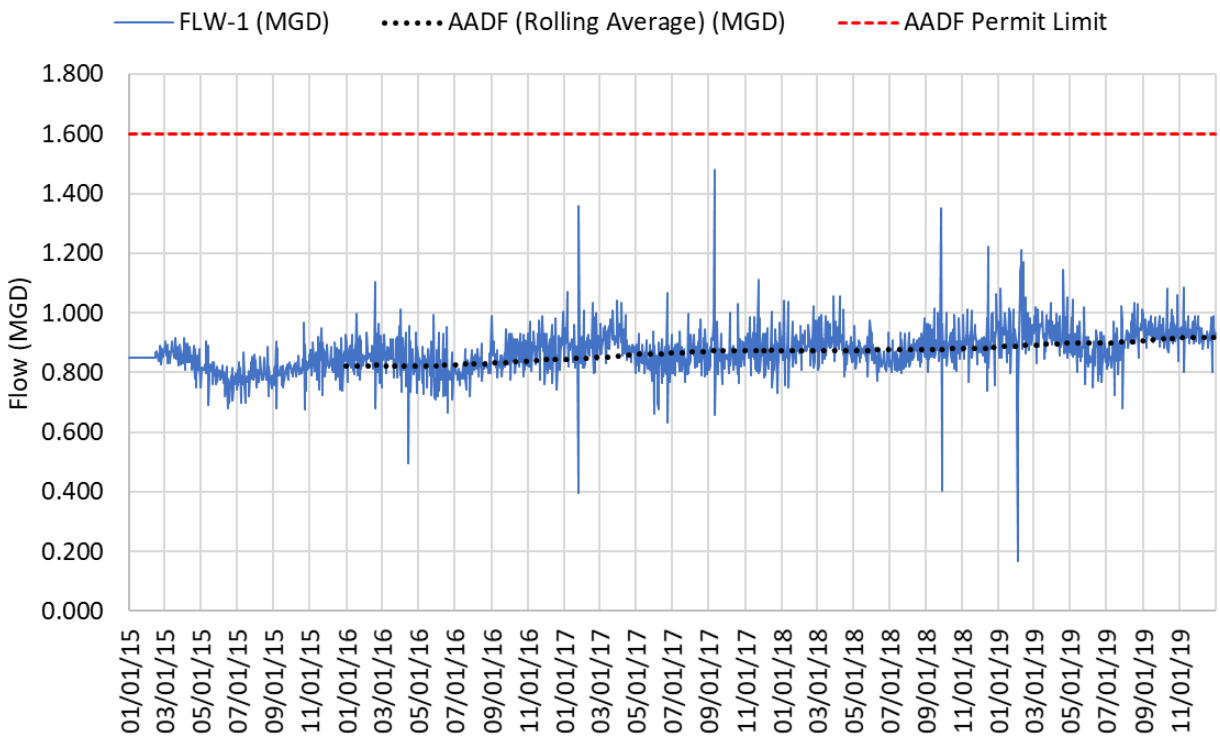


Table 5-2 Oak Run WWTF Annual Flows Summary (2015 to 2019)

Year	AADF (MGD)	MMADF (MGD)	M3MADF (MGD)	PDF (MGD)	MinDF (MGD)
2015	0.823	0.865	0.857	0.969	0.675
2016	0.845	0.883	0.874	1.102	0.495
2017	0.875	0.925	0.904	1.479	0.395
2018	0.886	0.916	0.904	1.352	0.404
2019	0.918	0.942	0.939	1.211	0.166

Figure 5-6, Figure 5-7, and Figure 5-8 depict the effluent TN concentrations, and influent concentrations, and mass loadings for $CBOD_5$ and TSS. The single samples for effluent TN, influent $CBOD_5$, and influent TSS concentrations are collected weekly per the operating permit.

Figure 5-6 Effluent TN at the Oak Run WWTF from 2015 to 2019

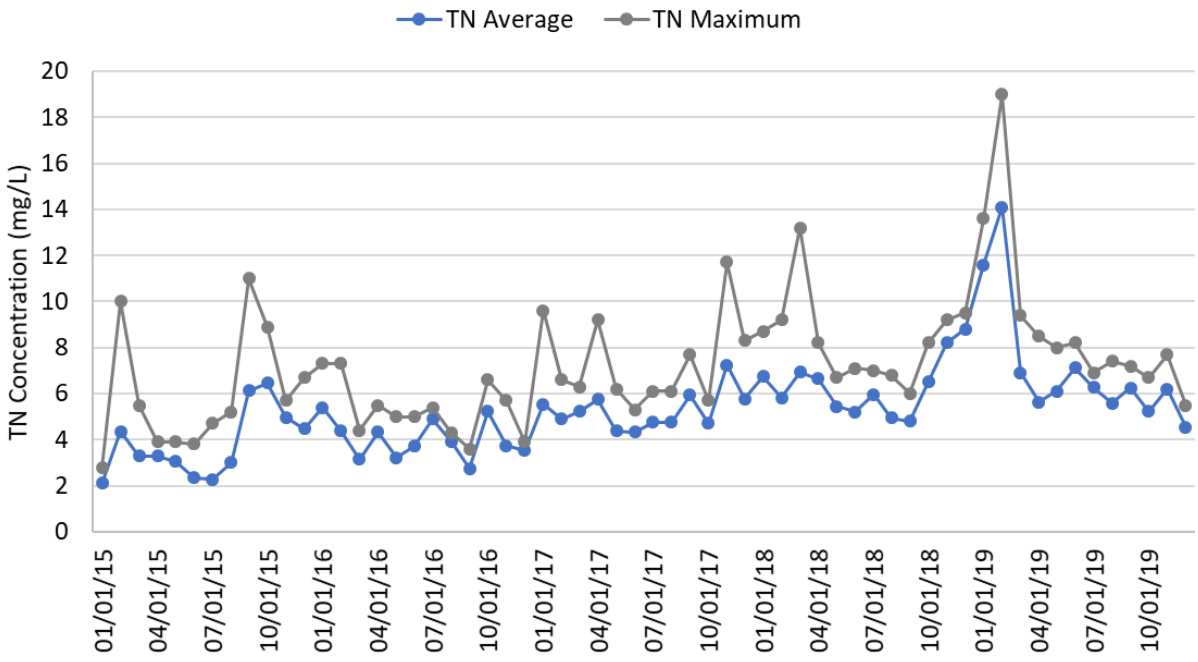


Figure 5-7 Influent $CBOD_5$ at the Oak Run WWTF from 2015 to 2019

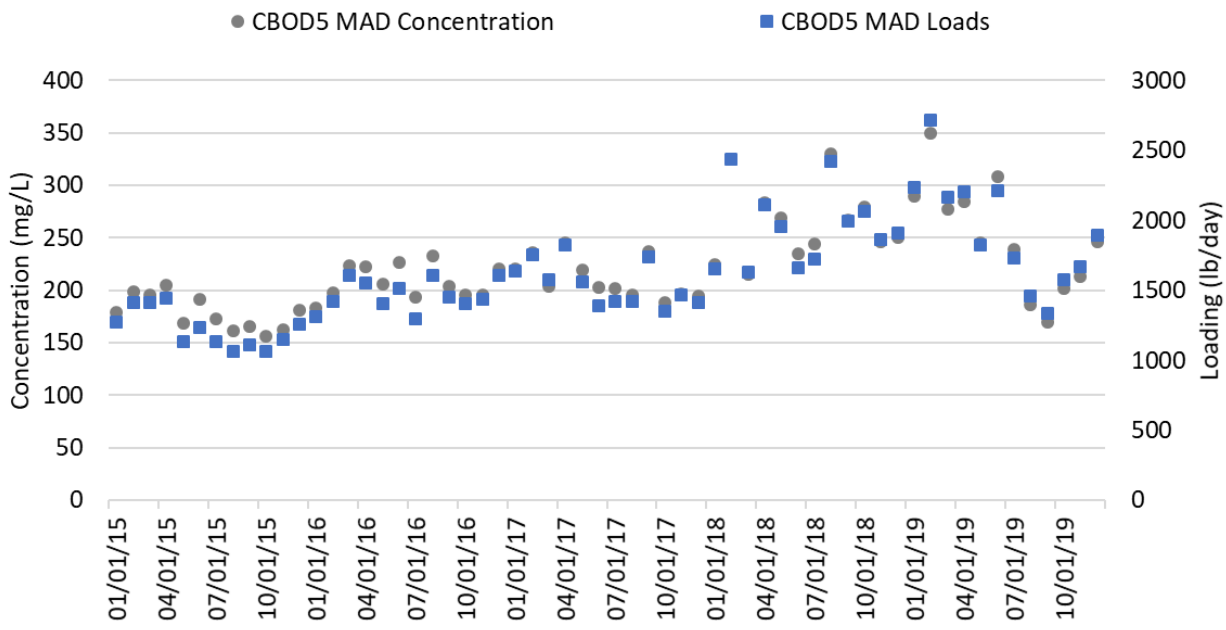
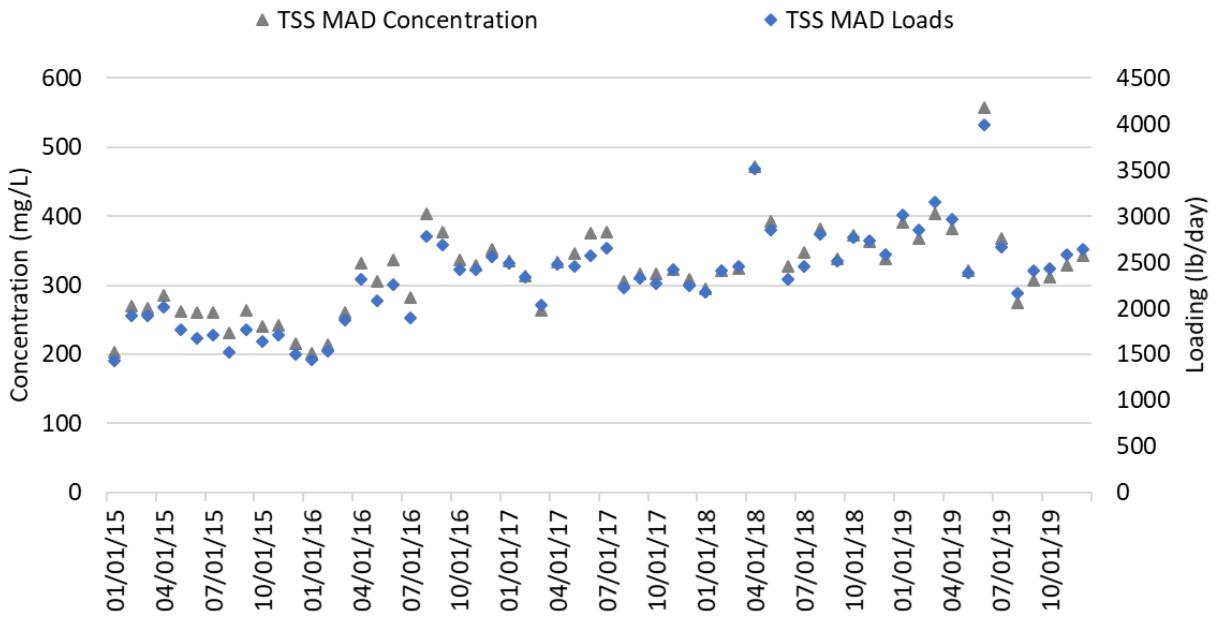


Figure 5-8 Influent TSS at the Oak Run WWTF from 2015 to 2019



The permit limit for effluent TN concentration in a single sample is 12.0 mg/L. TN concentrations ranged from a minimum of 0.7 mg/L in August 2018 to a maximum of 19 mg/L in February 2019. Six permit limit exceedances occurred over the 5-year monitoring period: one in March 2018, three in January 2019, and two in February 2019. The average TN concentration was 5 mg/L over the 5-year monitoring period. There appears to be a slight upward trend in the effluent TN concentration.

Influent $CBOD_5$ concentrations ranged from a minimum of 156 mg/L in October 2015 to a maximum of 350 mg/L in February 2019. The average $CBOD_5$ concentration over the 5-year monitoring period was 223 mg/L. This average concentration is within the typical $CBOD_5$ range of 110 to 350 mg/L for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). There appears to be a slight general upward trend in the influent $CBOD_5$ concentration.

Influent TSS concentrations ranged from a minimum of 202 mg/L in January 2016 to a maximum of 557 mg/L in June 2019. The average TSS concentration over the 5-year monitoring period was 322 mg/L, which is within the typical range of 120 to 400 mg/L TSS for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). There appears to be a slight general upward trend in the influent TSS concentration.

5.1.3 Salt Springs WWTF

The Salt Springs WWTF (Facility Id: FLA010686) is a 0.085-MGD 3-month daily flow (TMADF) permitted capacity membrane biological reactor process wastewater treatment plant. The total flow through the WWTF is metered at monitoring site number FLW-1. Water quality sampling is conducted at monitoring site number EFA-1. Figure 5-9 shows that the rolling average TMADF at the Salt Springs WWTF was consistently below the permitted limit of 0.085 MGD from January 2015 through December 2019. The elevated daily flow in April 2019 and October 2019 appear to be anomalies and may be input errors on the DMRs. Table 5-3 shows the annual summary of flow patterns from 2015 through 2019.

Figure 5-9 Influent Flows at the Salt Springs WWTF from 2015 to 2019

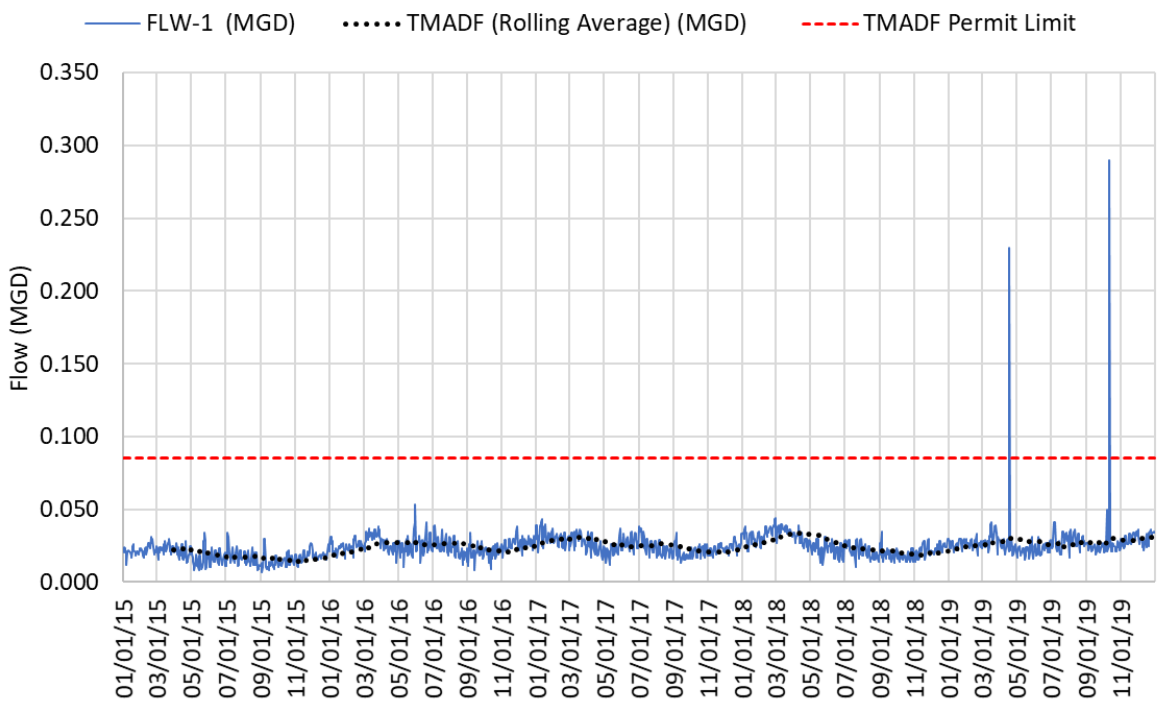


Table 5-3 Salt Springs WWTF Annual Flows Summary (2015 to 2019)

Year	AADF (MGD)	MMADF (MGD)	M3MADF (MGD)	PDF (MGD)	MinDF (MGD)
2015	0.018	0.023	0.022	0.034	0.007
2016	0.025	0.032	0.027	0.053	0.008
2017	0.025	0.032	0.030	0.043	0.012
2018	0.025	0.036	0.033	0.044	0.010
2019	0.028	0.034	0.031	0.290	0.015

Figure 5-10, Figure 5-11, and Figure 5-12 depict the effluent TN concentrations, influent concentrations, and mass loadings for both $CBOD_5$ and TSS. The single samples for effluent

TN, influent $CBOD_5$, and influent TSS concentrations are collected monthly and averaged annually per the operating permit.

The permit limit for effluent TN concentration in a single sample is 12.0 mg/L. TN concentrations ranged from a minimum of 1.6 mg/L in April 2016 to a maximum of 68 mg/L in January 2015 and March 2015. Eighteen permit limit exceedances occurred over the 5-year monitoring period: seven in 2015, four in 2016, four in 2017, and four in 2019. The average TN concentration was 13.14 mg/L over the 5-year monitoring period. There appears to be a slight downward trend in the effluent TN concentration.

Influent $CBOD_5$ concentrations ranged from a minimum of 168 mg/L in 2019 to a maximum of 384 mg/L in 2016. The average $CBOD_5$ concentration over the 5-year monitoring period was 296 mg/L. This average concentration is within the typical $CBOD_5$ range of 110 to 350 mg/L for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). There appears to be a general downward trend in the influent $CBOD_5$ concentration since 2016.

Influent TSS concentrations ranged from a minimum of 142 mg/L in 2019 to a maximum of 670 mg/L in 2016. The average TSS concentration over the 5-year monitoring period was 381 mg/L, which is within the typical range of 120 to 400 mg/L TSS for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). A general downward trend is apparent in the influent TSS concentrations.

Figure 5-10 Effluent TN at the Salt Springs WWTF from 2015 to 2019

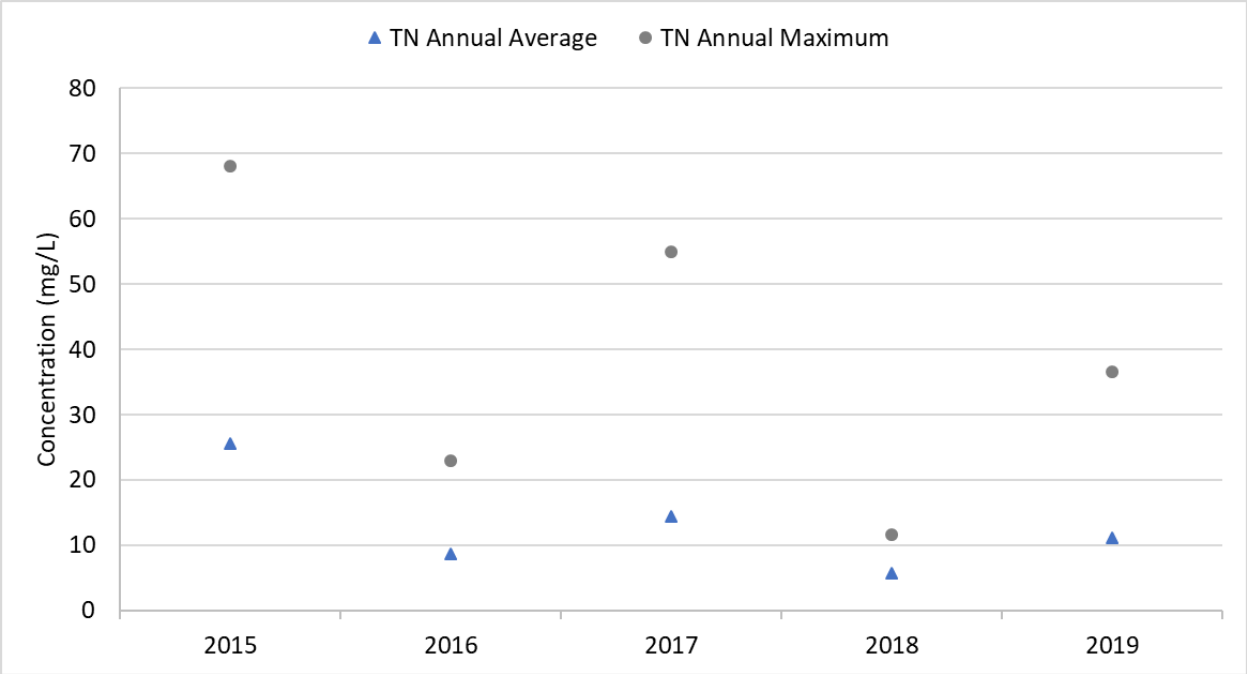


Figure 5-11 Influent $CBOD_5$ at the Salt Springs WWTF from 2015 to 2019

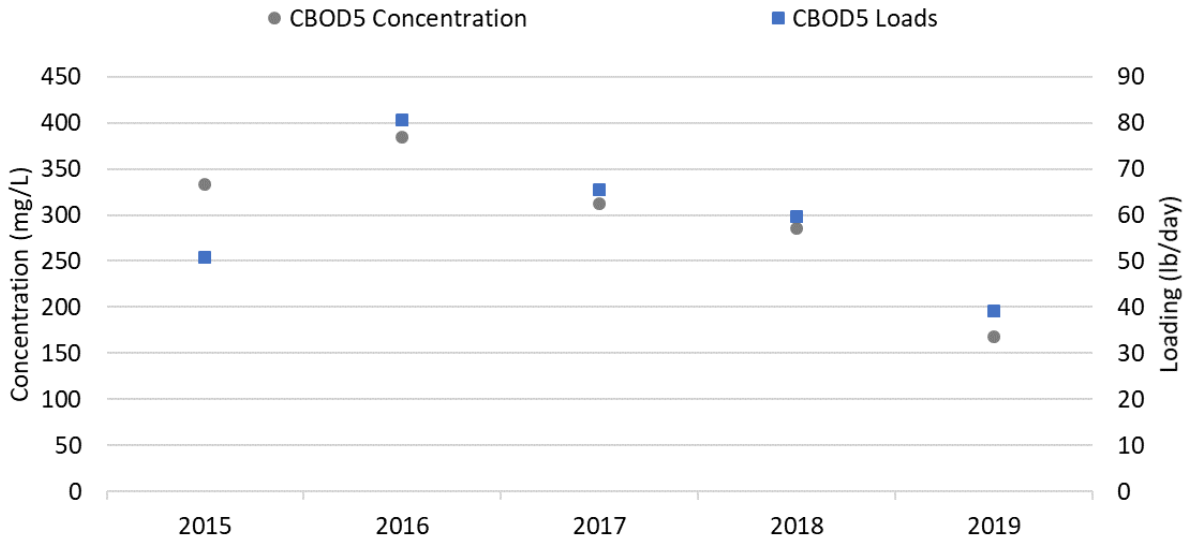
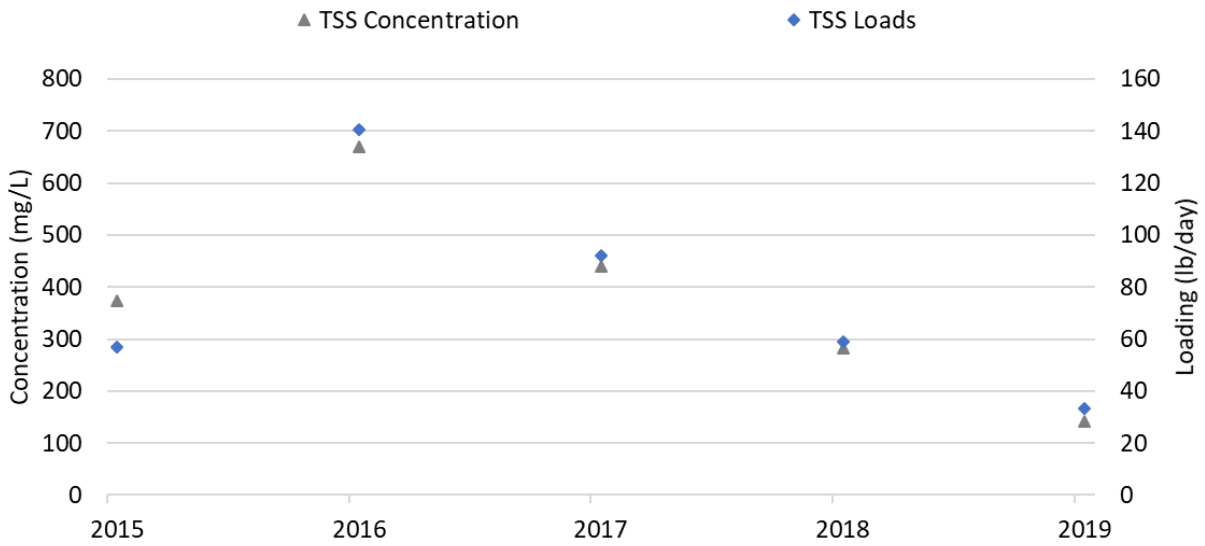


Figure 5-12 Influent TSS at the Salt Springs WWTF from 2015 to 2019



5.1.4 Silver Springs Shores WRF

The Silver Springs Shores WRF (Facility ID: FLA296651) is a 2.0-MGD AADF permitted capacity extended aeration wastewater treatment plant. The total flow through the WRF is metered at monitoring site number FLW-3. Water quality sampling is conducted at monitoring site number EFA-1. Figure 5-13 shows that the rolling average AADF at the Silver Springs Shores WRF was consistently below the permitted limit of 2.0 MGD from January 2015 through December 2019. Table 5-4 shows the annual summary of flow patterns from 2015 through 2019. Within the first 5-year planning period, approximately 0.15 MGD will be permanently diverted from the Silver Springs Shores WRF to the Stonecrest WWTF.

Figure 5-13 Influent Flows at the Silver Springs Shores WRF from 2015 to 2019

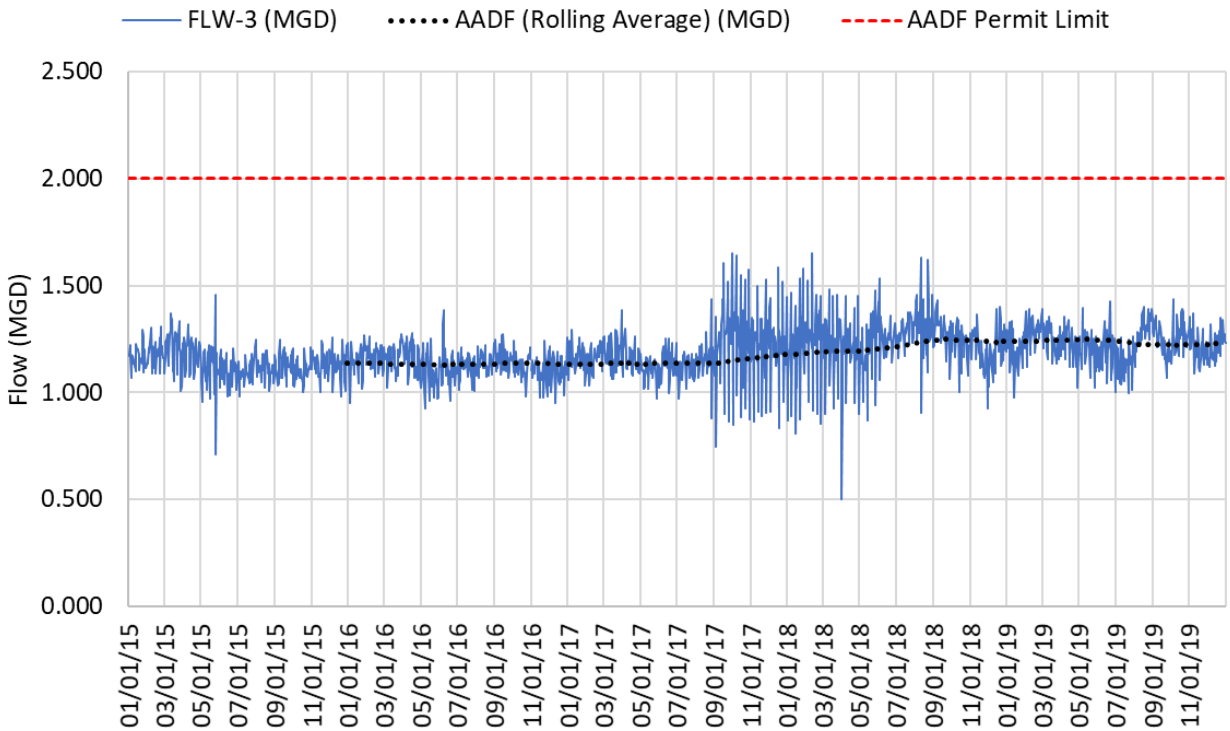


Table 5-4 Silver Springs Shores WRF Annual Flows Summary (2015 to 2019)

Year	AADF (MGD)	MMADF (MGD)	M3MADF (MGD)	PDF (MGD)	MinDF (MGD)
2015	1.139	1.204	1.195	1.455	0.708
2016	1.133	1.173	1.169	1.384	0.926
2017	1.179	1.270	1.248	1.653	0.748
2018	1.238	1.327	1.300	1.650	0.499
2019	1.228	1.292	1.264	1.435	0.976

Figure 5-14, Figure 5-15, and Figure 5-16 depict the effluent TN concentrations, influent concentrations, and mass loadings for both $CBOD_5$ and TSS. The single samples for effluent

TN, influent $CBOD_5$, and influent TSS were collected monthly until April 2019; per the February 2019 operating permit, single samples are now collected weekly.

Figure 5-14 Effluent TN at the Silver Springs Shores WTF from 2015 to 2019

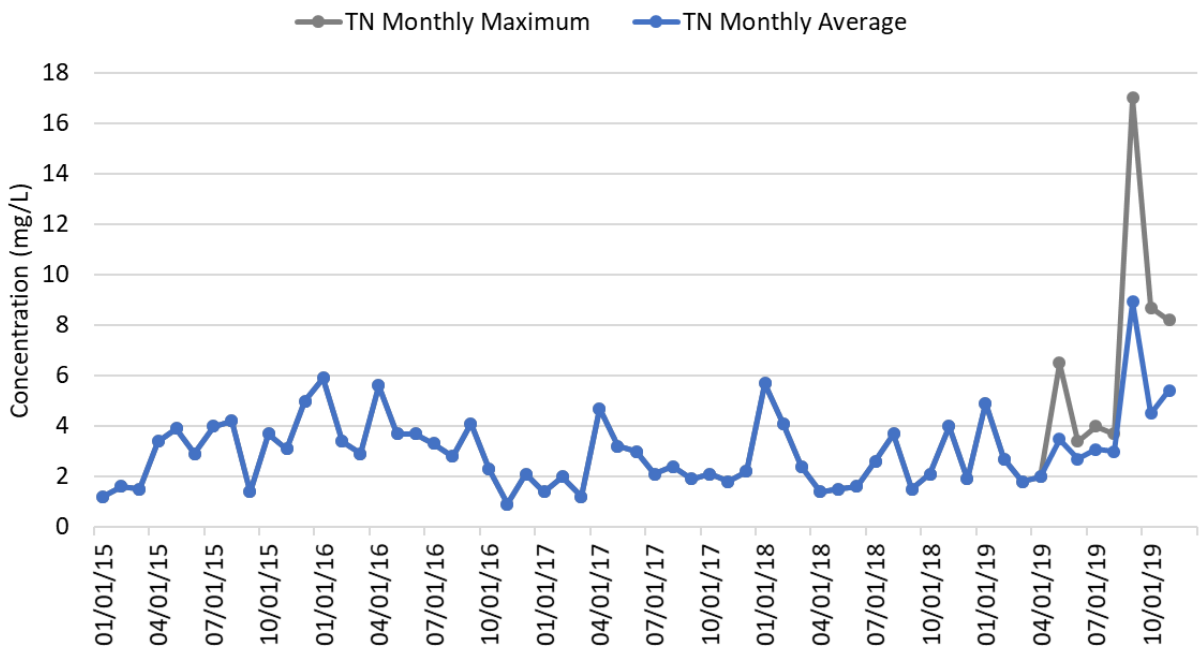


Figure 5-15 Influent $CBOD_5$ at the Silver Springs Shores WRF from 2015 to 2019

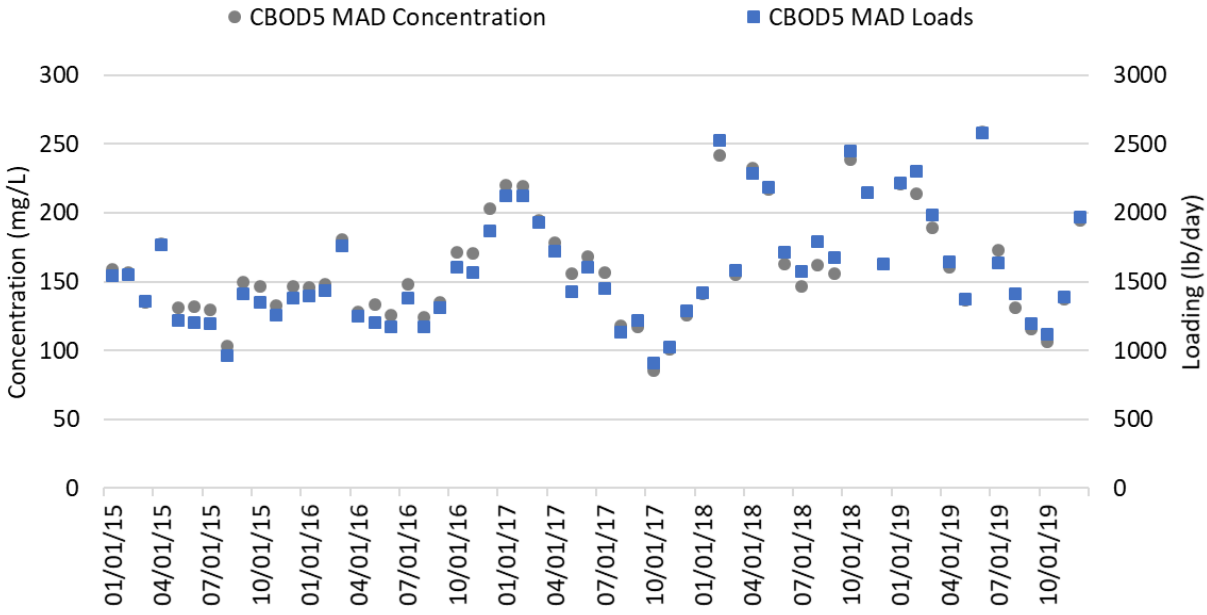
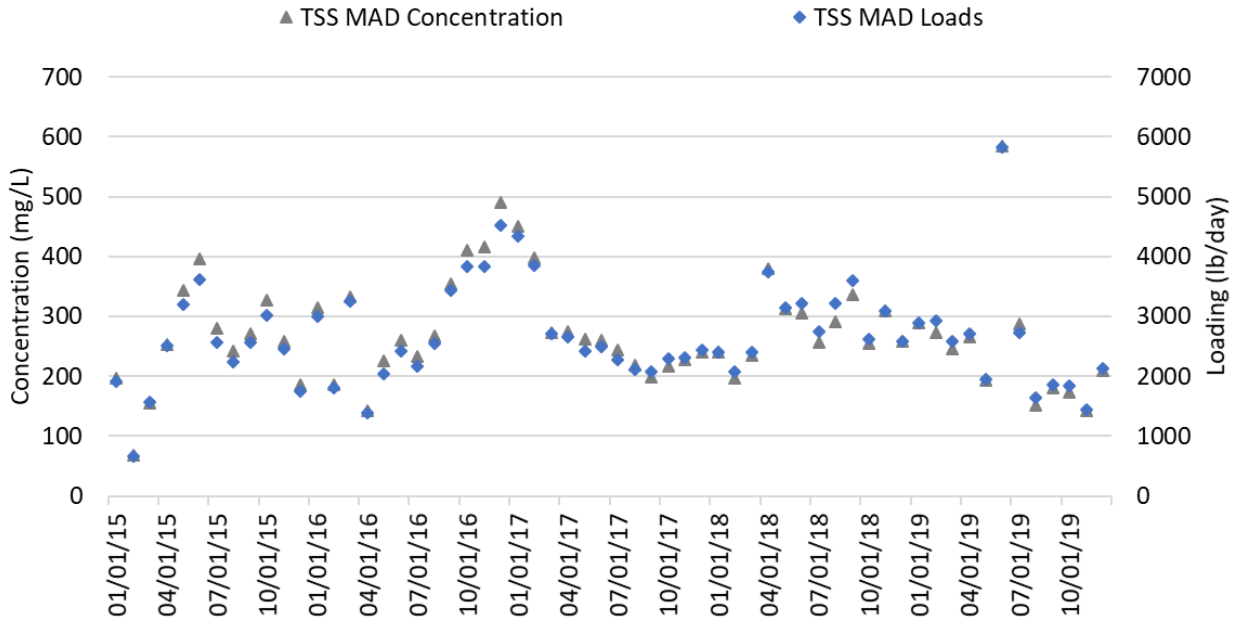


Figure 5-16 Influent TSS at the Silver Springs Shores WRF from 2015 to 2019



The Silver Springs Shores WRF is undergoing modification, through internal process and equipment changes, to accommodate increased flow and to ensure compliance with the TN limits associated with the BMAP. When modifications are complete, the final permit limits for effluent TN concentration in a single sample will be 6.0 mg/L for the sprayfield and 3.0 mg/L for RIBs; the previous permit limit was 12 mg/L and in the interim, there are no set limits. Sampled TN concentrations ranged from a minimum of 0.9 mg/L in December 2016 to a maximum of 17 mg/L in October 2019. Prior to February 2019, when the new permit was issued, there were no permit limit exceedances. The average TN concentration was 3.47 mg/L over the 5-year monitoring period. No obvious increasing or decreasing trends occur in the effluent TN concentration.

Influent $CBOD_5$ concentrations ranged from a minimum of 86 mg/L in October 2017 to a maximum of 259 mg/L in June 2019. The average $CBOD_5$ concentration over the 5-year monitoring period was 160 mg/L, which is within the typical $CBOD_5$ range of 110 to 350 mg/L for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). No obvious increasing or decreasing trends occur in the influent $CBOD_5$ concentrations.

Influent TSS concentrations ranged from a minimum of 68 mg/L in February 2015 to a maximum of 584 mg/L in June 2019. The average TSS concentration over the 5-year monitoring period was 270 mg/L, which is within the typical range of 120 to 400 mg/L TSS for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). No obvious increasing or decreasing trends occur in the influent TSS concentration.

5.1.5 Stonecrest WWTF

The Stonecrest WWTF (Facility ID: FLA010741) is a 1.0 MGD AADF design capacity, 0.670 MGD AADF permitted capacity, four-stage Bardenpho biological domestic wastewater treatment plant. The total flow through the WWTF is metered at monitoring site number FLW-1. Water quality sampling is conducted at monitoring site number EFA-1. Figure 5-17 shows that the average rolling AADF at the Stonecrest WWTF was consistently below the permitted limit of 0.670 MGD from January 2015 through December 2019. Table 5-5 shows the annual summary of flow patterns from 2015 through 2019. Within the first 5-year planning period, approximately 0.15 MGD will be permanently diverted from the Silver Springs Shores WRF to the Stonecrest WWTF.

Figure 5-17 Influent Flows at the Stonecrest WWTF from 2015 to 2019

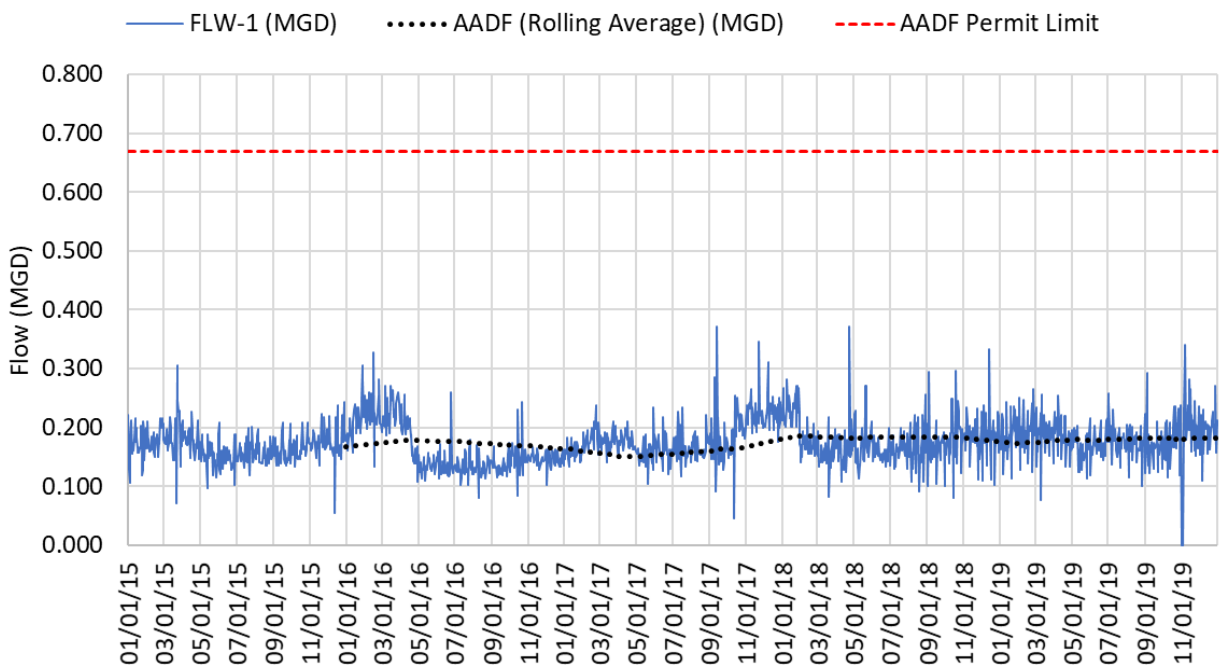


Table 5-5 Stonecrest WWTF Annual Flows Summary (2015-2019)

Year	AADF (MGD)	MMADF (MGD)	M3MADF (MGD)	PDF (MGD)	MinDF (MGD)
2015	0.167	0.184	0.181	0.305	0.054
2016	0.164	0.228	0.221	0.327	0.080
2017	0.180	0.226	0.213	0.372	0.046
2018	0.176	0.228	0.226	0.371	0.080
2019	0.182	0.194	0.190	0.341	0.000

Figure 5-18, Figure 5-19, and Figure 5-20 depict the effluent TN concentrations and the influent concentrations and mass loadings for both $CBOD_5$ and TSS. The single samples for effluent TN, influent $CBOD_5$, and influent TSS in are collected weekly per the operating permit.

The permit limit for effluent TN concentration in a single sample is 12.0 mg/L. TN concentrations ranged from a minimum of 0.14 mg/L in November 2016 to a maximum of 18 mg/L in August 2015. Four permit limit exceedances occurred over the 5-year monitoring period: two in 2015 and two in 2019. The average TN concentration was 2.67 mg/L over the 5-year monitoring period. There appears to be a very slight upward trend in the effluent TN concentration.

Figure 5-18 Effluent TN at the Stonecrest WWTF from 2015 to 2019

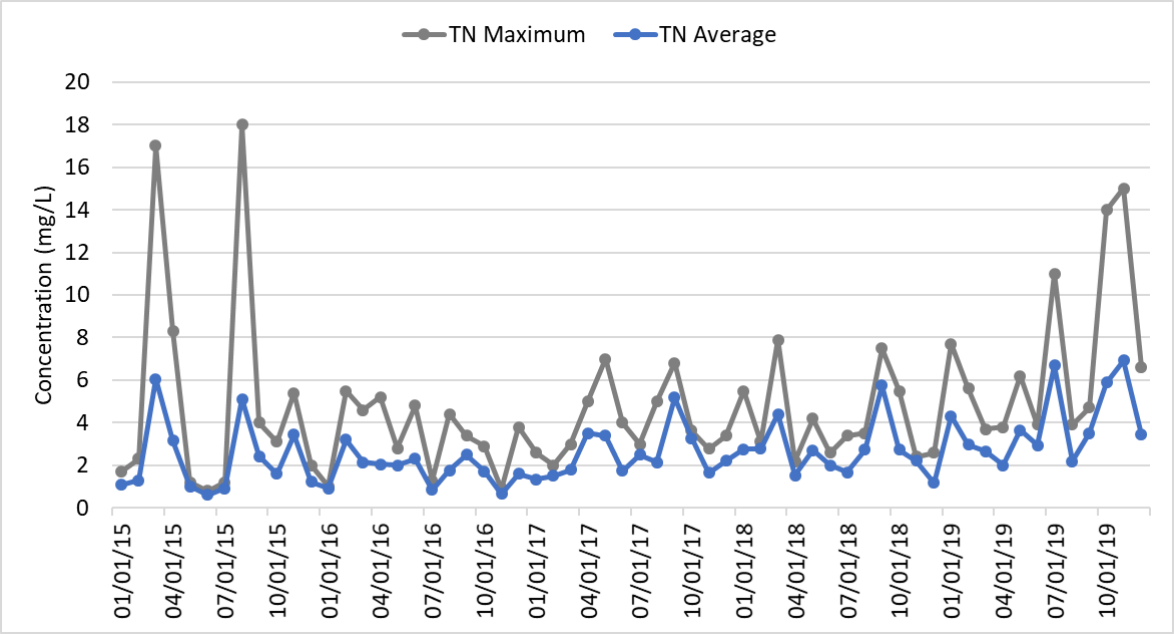


Figure 5-19 Influent $CBOD_5$ at the Stonecrest WWTF from 2015 to 2019

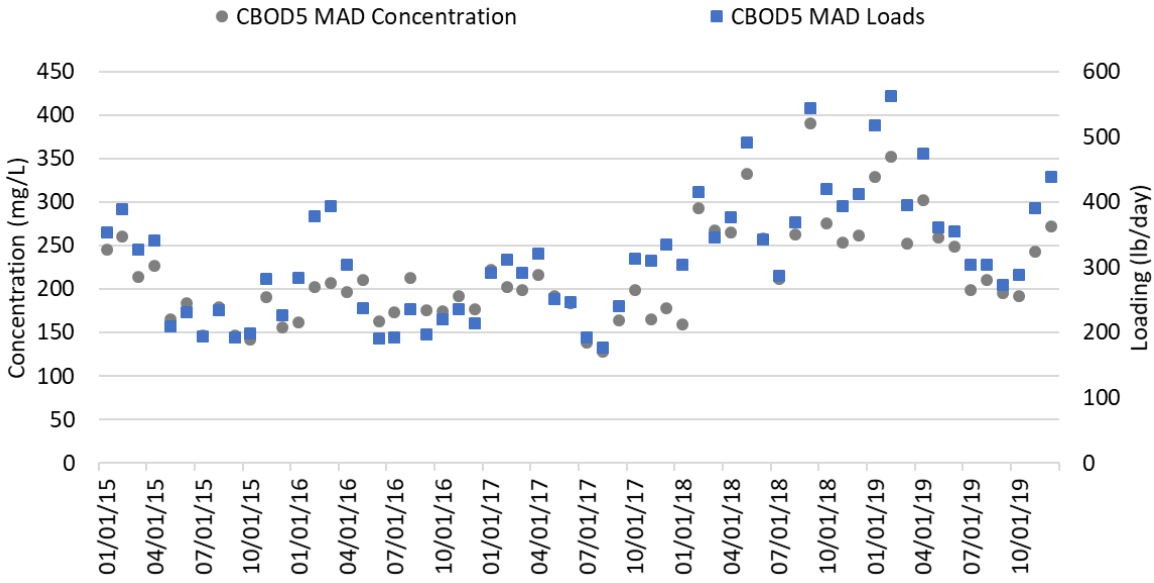
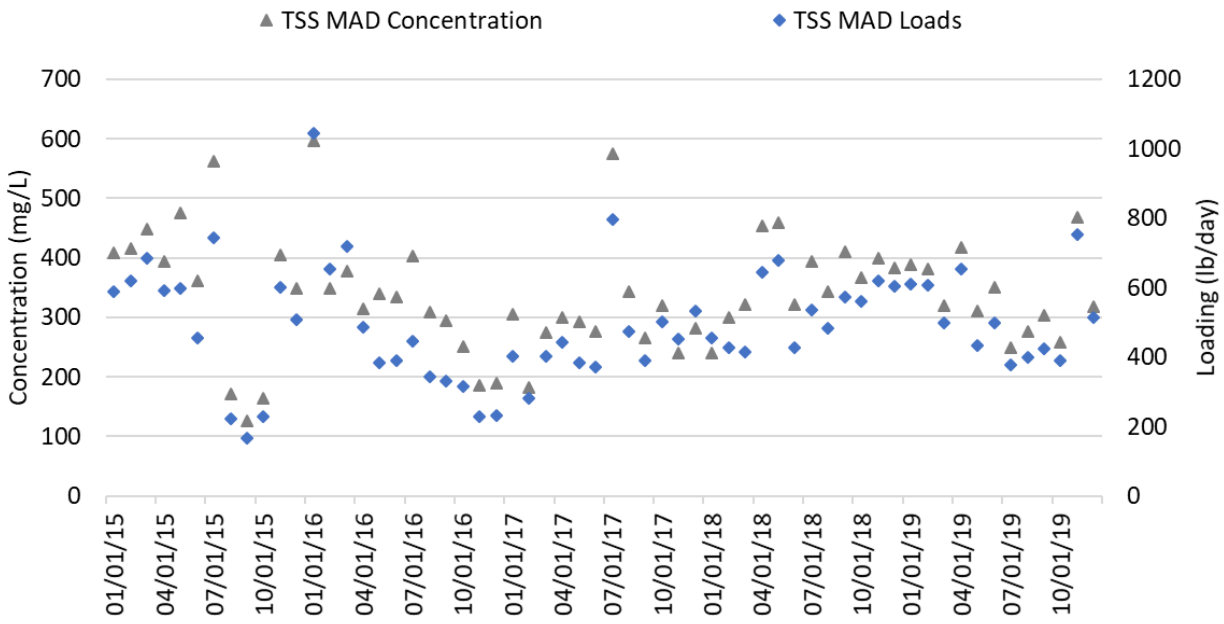


Figure 5-20 Influent TSS at the Stonecrest WWTF from 2015 to 2019



Influent $CBOD_5$ concentrations ranged from a minimum of 128 mg/L in August 2017 to a maximum of 390 mg/L in September 2018. The average $CBOD_5$ concentration over the 5-year monitoring period was 216 mg/L. This average concentration is within the typical $CBOD_5$ range for of 110 to 350 mg/L for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). A slight upward trend is apparent in the influent $CBOD_5$ concentration.

Influent TSS concentrations ranged from a minimum of 127 mg/L in September 2015 to a maximum of 597 mg/L in January 2016. The average TSS concentration over the 5-year monitoring period was 337 mg/L, which is within the typical range of 120 to 400 mg/L TSS for domestic wastewater (Wastewater Engineering, 5th edition by Metcalf & Eddy, 2014). No obvious increasing or decreasing trends occur in the influent TSS concentrations.

5.2 Capacity Assessment of Existing WWTFs

Recommended improvements to the sewer collection and transmission system listed in Chapter 4 are based on the implementation of S2S projects within each of the five selected PPAs as well as projected residential and non-residential wastewater flows. In this Chapter, projected flows and loads for each WWTF impacted by recommended improvements are summarized and, based on these flows and loads, the capacity of each WWTF is assessed. Projected flows and loads and potential capacity improvements were not evaluated at the Salt Springs WWTF because it is outside of the BMAP.

5.2.1 Projected Flows and Loads

Projected flows at the Northwest Regional WWTF were based on an evaluation of the needed capacity in the region by Kimley Horn in 2017, *Golden Ocala – Wastewater Treatment Facility Expansion Alternatives Evaluation*, and the Preliminary Engineering Design Report prepared by Constantine Engineering (Constantine) in August 2019. Initial Kimley Horn

estimates were developed over three planning periods – 2022, 2027, and 2037 – and were adjusted to reflect the Golden Ocala developer's immediate term and ultimate buildout planning periods – 2028 and 2038. For the purposes of this FAR, projected flows at the Northwest Regional WWTF were included in 2030 and 2040.

Projected flows at the Oak Run, Silver Springs Shores, and Stonecrest WWTFs were developed in five-year increments over a twenty-year planning period based on the selected PPAs and projected residential and non-residential wastewater flows. Table 5-6 lists the future flows in each WWTF sewershed based on the population projections; Silver Springs Shores includes the future flows from the S2S conversion projects in the five selected PPAs. The phasing of the sewer conversion flow projections in the Silver Springs Shores sewershed is based on an estimated 650 parcels connected per year.

Projected loads were developed based on the projected flows and the average load concentration at each plant from January 2015 to December 2019. Table 5-7 shows the additional annual projected $CBOD_5$ load to each plant in pounds per day (lb/day) and Table 5-8 shows the additional annual projected TSS load to each plant in lb/day.

Table 5-6 Projected Wastewater Flows per Year

WWTF	Permitted Capacity (MGD)	AADF (MGD)	Additional Annual Projected Flows (MGD)			
		2019	2025	2030	2035	2040
Northwest Regional	0.2[1]	0.080	—	0.5010	—	1.7600
Oak Run	1.6	0.918	0.0393	0.0343	0.0326	0.0245
Silver Springs Shores	2.0	1.228	0.5828	0.7234	0.6850	0.5671
Stonecrest	1.0	0.182	0.0063	0.0054	0.0056	0.0054

[1]Current permitted capacity; capacity expansion is planned for the near-term.

Table 5-7 Approximate Projected Wastewater $CBOD_5$ Loads per Year

WWTF	Avg. $CBOD_5$[1] (mg/L)	Additional Annual Projected Loads (lb/day)			
		2025	2030	2035	2040
Northwest Regional	64	—	267	—	939
Oak Run	223	73	64	61	46
Silver Springs Shores	160	778	965	914	757
Stonecrest	216	11	10	10	10

[1]Typical $CBOD_5$ range for domestic wastewater is 110 to 350 mg/L.

Table 5-8 Approximate Projected Wastewater TSS Loads per Year

WWTF	Avg. TSS[1] (mg/L)	Additional Annual Projected Loads (lb/day)			
		2025	2030	2035	2040
Northwest Regional	97	—	405	—	1,424
Oak Run	322	106	92	88	66
Silver Springs Shores	270	1,312	1,629	1,542	1,277
Stonecrest	337	18	15	16	15

[1]Typical TSS range for domestic wastewater is 120 to 400 mg/L.

5.2.2 Capacity Assessment

Based on the projected flows and loads, the capacity of each of the County's WWTFs and the ability to meet the projected flows and loads throughout the 20-year planning horizon was assessed. Table 5-9 shows the projected cumulative wastewater flows based on current projections. The Northwest Regional and Silver Springs Shores WWTFs are expected to exceed their permitted capacities over the 20-year planning horizon; the remaining plants will not require improvements or expansions to address the impacts of the recommendations. The Northwest Regional WWTF is expected to exceed permitted capacity before 2030; a multi-phase capacity expansion is already planned to address projected flows through 2040. If the five selected PPAs are to be completed within the 20-year planning horizon they must be implemented at an aggressive rate of approximately 650 parcels converted per year; at this rate the Silver Springs Shores WRF is expected to exceed permitted capacity between 2025 and 2030; a capacity expansion will be required to meet projected demand.

Table 5-9 Projected Cumulative Wastewater Flows

WWTF	Permitted Capacity (MGD)	AADF (MGD)	Annual Projected Flows (MGD)			
		2019	2025	2030	2035	2040
Northwest Regional	0.2	0.080	—	0.5010	—	1.7600
Oak Run	1.6	0.918	0.9573	0.9916	1.0242	1.0487
Silver Springs Shores	2.0	1.228	1.8108	2.5342	3.2192	3.7863
Stonecrest	1.0	0.182	0.1883	0.1937	0.1993	0.2047

5.3 Summary of Performance-Limiting Factors and Recommended Improvements

Assuming actual flows follow the projections identified in Section 5.2, the Silver Springs Shores WRF is expected to exceed permitted capacity between 2025 and 2030. Based on these projections, the County will need to start planning expansion in 2025 and complete some level of expansion by 2030. It is recommended that the plant be expanded to 4 MGD to meet the total demand projected over the 20-year planning horizon; the County may consider expanding the plant in two, 1-MGD phases based on how flows increase compared to these projections and funding availability.

The Silver Springs BMAP and the Rainbow Springs Group BMAP were each adopted in 2015 and combined in 2018. The 2018 combined BMAP includes updated effluent standards for all new WWTFs within the PFA with a permitted discharge of 0.1 MGD or greater – they must meet an effluent standard for nitrogen of 3 mg/L for all disposal methods. The 2015 adopted BMAP effluent standards for existing facilities were maintained in the 2018 BMAP; Table 5-10 presents effluent standards for existing WWTFs. The 2018 BMAP was challenged and, while the challenge was resolved in early 2021, a Final Order detailing the BMAP's new effective date has not been issued. Therefore, as of the publication of this report, the effluent disposal limits are not active.

Table 5-10 Effluent Standards Adopted with the 2015 BMAP

	Flow (MGD)	TN Concentration (mg/L)		
		Rapid-Rate Land Application	Slow-Rate Land Application	Public Access Reuse
In PFA	≥ 0.5	3	3	10
	< 0.5 and ≥ 0.01	3	6	10
	< 0.01	10	10	10
Out of PFA	≥ 0.01	6	6	10
	< 0.01	10	10	10

Table 5-11 presents the MCUD WWTFs with their permitted capacity, location relative to the BMAP and PFA boundaries, current permitted TN limit, average TN over the 5-year monitoring period, and the required TN limit once the BMAP challenge is resolved and the aforementioned TN limits are presumably adopted.

Table 5-11 MCUD WWTF Permitted TN Limits and BMAP Requirements

WWTF	BMAP	PFA	Permitted Capacity (MGD)	Current TN Limit	Average TN, 5-year Monitoring Period	Average TN, 2019	TN Limit per BMAP
				(mg/L)			
Northwest Regional	In	Out	0.2	Report, AA	47.4	46.48	6[1], 6[2], 10[3]
Oak Run	In	Out	1.6	12, SS	5	7.13	6[1], 6[2], 10[3]
Salt Springs	Out	Out	0.085	12, SS	13.14	11.15	NA
Silver Springs Shores	In	In	2.0	12, AA	3.47	4.27	3[1], 3[2], 10[3]
Stonecrest	In	Out	1.0	12, SS	2.67	4.02	6[1], 6[2], 10[3]

Notes: SS = Limit Based on Single Sample; AA = Limit Based on Annual Average; NA = Not Applicable.
[1]Rapid-Rate Land Application Limit, [2]Slow-Rate Land Application Limit, [3]Public Access Reuse Limit.

Northwest Regional and Silver Springs Shores are already undergoing modifications and are expected to meet these requirements. In anticipation of the adoption of the BMAP, it is recommended that the County begin planning to upgrade the Oak Run and Stonecrest WWTFs as well to meet the new BMAP requirements for existing WWTFs within the BMAP and PFA. These modifications will also provide additional nutrient load reduction within the BMAP, helping to meet the Countywide nitrogen reduction goal.

5.4 Cost Estimates of Recommended WWTF Improvements

Using a budget estimate of $15 per gallon based on recent costs of similarly sized plant expansions, construction cost of the recommended plant expansion for Silver Springs Shores WRF is estimated as $30,000,000 in 2020 dollars, assuming a 2.0 MGD expansion. Effluent disposal needs, as discussed in Chapter 6, may incur additional costs.

6 OVERVIEW OF WATER REUSE

MCUD has five WWTFs with a total of 10 permitted effluent disposal options, summarized in Table 6-1. This chapter presents an overview of the existing effluent quality and quantity at each WWTF based on FDEP domestic wastewater facility permits and the projected effluent quality and quantity at each WWTF based on the results of Chapters 3 through 5. Based on the existing and projected effluent quality and quantity, the effluent disposal needs over the 20-year planning horizon were assessed along with the timing and estimated cost of needed improvements.

Table 6-1 MCUD Existing Effluent Disposal Options

WWTF	Name	Effluent Quality	Permitted Capacity (MGD)	Detail
Northwest Regional	R-001	Slow-rate restricted public access	0.015	1.94-acre sprayfield
	R-002	Slow-rate public access	1.03	Golf courses and common areas
Oak Run	R-001	RIB	1.6	16 RIBs, 12 acres
	R-002	Slow-rate public access	1.6	Irrigation within Reuse Service Area
Salt Springs	R-001	RIB	0.085	2 RIBs, 2.07 acres
Silver Springs Shores	R-001	Slow-rate restricted public access	1.0	130-acre sprayfield
	R-002	RIB	0.5	4 RIBs, 8 acres
	R-003	Slow-rate public access	1.25	Golf courses
Stonecrest	R-001	RIB	0.32	6 RIBs, 3.9 acres
	R-002	Slow-rate public access	0.35	Golf course

6.1 Existing Effluent Quantity and Quality

6.1.1 Northwest Regional WWTF

The Northwest Regional WWTF has two effluent disposal options, Land Application R-001 and Land Application R-002. Northwest Regional R-001 is an existing, 0.015 MGD AADF permitted capacity slow-rate restricted public access system which consists of a sprayfield with a total wetted area of 1.94 acres; this effluent disposal option will be removed by the footprint of the planned plant expansion. Northwest Regional R-002 is a 1.030 MGD AADF permitted capacity slow-rate public access system which consists of an existing golf course, the Golden Ocala Golf Course (155 acres, 0.160 MGD permitted capacity), a proposed golf course with a permitted capacity of 0.730 MGD, and existing common areas with a permitted capacity of 0.140 MGD. Wet weather flows at Northwest Regional R-002 are diverted to a 0.900-MG lined pond with overflow sent to a 0.900-MG lined reject pond.

6.1.2 Oak Run WWTF

The Oak Run WWTF has two effluent disposal options, Land Application R-001 and Land Application R-002. Oak Run R-001 is an existing, 1.6-MGD AADF permitted capacity rapid infiltration basin (RIB) system which consists of 16 RIBs with a total wetted area of 12 acres. Oak Run R-002 is an existing, 1.6-MGD AADF permitted capacity slow-rate public access system which consists of irrigation within the approved 457.8-acre Reuse Service Area; wet-weather flows can be sent to Oak Run R-001.

6.1.3 Salt Springs WWTF

The Salt Springs WWTF has one effluent disposal option, Land Application R-001. Salt Springs R-001 is an existing, 0.085-MGD TMADF permitted capacity RIB system that consists of two RIBs with a total wetted area of 2.07 acres.

6.1.4 Silver Springs Shores WRF

The Silver Springs Shores WRF has three effluent disposal options: Land Application R-001, Land Application R-002, and Land Application R-003. Silver Springs Shores R-001 is an existing, 1.00-MGD AADF permitted capacity slow-rate restricted public access (except subsurface) system that consists of a sprayfield with a total wetted area of 130 acres. Silver Springs Shores R-002 is an existing, 0.50-MGD AADF permitted capacity RIB system that consists of four RIBs with a total wetted area of 8 acres (2.0 acres each). Silver Springs Shores R-003 is an existing, 1.25-MGD AADF permitted capacity slow-rate public access system that consists of three golf courses (Lake Diamond, Spruce, and Baseline) and other landscape irrigation.

6.1.5 Stonecrest WWTF

The Stonecrest WWTF has two effluent disposal options, Land Application R-001 and Land Application R-002. Stonecrest R-001 is an existing, 0.320-MGD AADF permitted capacity RIB system that consists of six RIBs with a total wetted area of 3.9 acres. Stonecrest R-002 is an existing, 0.350-MGD AADF permitted capacity slow-rate public access system that consists of irrigation at the 128-acre Stonecrest Golf Course; wet-weather and reject flows are sent to Stonecrest R-001 and are limited to 1.0 MGD MMADF.

6.2 Projected Effluent Quantity and Quality

Based on the projected flows and loads identified in Chapters 3 through 5, only the Northwest Regional WWTF and the Silver Springs Shores WRF are expected to exceed permitted treatment capacity over the 20-year planning horizon.

6.2.1 Northwest Regional WWTF

The current permitted effluent disposal capacity for the Northwest Regional WWTF is 1.045 MGD; once the planned expansion is complete the effluent disposal capacity will be reduced to 1.03 MGD based on the loss of Northwest Regional R-001. Based on the projected flows identified in Table 5-9, the Northwest Regional WWTF is expected to exceed its permitted disposal capacity between 2030 and 2040. The maximum projected flows to the Northwest Regional WWTF in 2040 are 1.76 MGD AADF, and a multi-phase expansion has begun to address projected flows and effluent disposal needs through 2040. At this time, the build-out WWTF expansion is planned for 2.0 MGD AADF.

6.2.2 Silver Springs Shores WRF

The current permitted effluent disposal capacity for the Silver Springs Shores WRF is 2.75 MGD. Based on the projected flows identified in Table 5-9, the Silver Springs Shores WRF is expected to exceed its permitted disposal capacity between 2030 and 2035. The maximum projected flows to the Silver Springs WRF in 2040 are 3.7863 MGD AADF; therefore, the effluent disposal should be expanded to 4 MGD within the planning horizon.

6.3 Effluent Disposal Options

Effluent management modifications are required at the Northwest Regional WWTF and the Silver Springs Shores WRF to address projected effluent disposal needs over the 20-year planning horizon.

6.3.1 Northwest Regional WWTF

The Northwest Regional WWTF is on a an approximately 17.40-acre parcel owned by Marion County. The WWTF is in the northeast quadrant of the parcel, the sprayfield is in the southeast quadrant of the parcel, and the lined, wet-weather storage and reject ponds are in the center of the parcel. Due to the limited availability of land on the WWTF parcel and the planned expansions, additional effluent disposal alternatives on this parcel are not feasible.

The current permitted treatment capacity of the Northwest Regional WWTF is 0.20 MGD AADF; the current permitted effluent disposal capacity of the Northwest Regional WWTF is 1.045 MGD (1.03 MGD when plant expansion is complete). A project is currently planned to add a RIB effluent disposal site at the Garcia Property, southeast of the WWTF across NW 70th Avenue, as an additional effluent disposal option. The proposed RIBs are expected to have a minimum effluent disposal capacity of 0.800 MGD, providing one hundred percent redundant restricted-access disposal capacity for the permitted treatment capacity of the first WWTF expansion that started construction in 2020.

Future planned expansions are anticipated to increase the permitted treatment capacity of the Northwest Regional WWTF to 2.0 MGD AADF to meet the projected 1.76-MGD wastewater flows. To maintain 100-percent redundant restricted-access capacity, the RIB capacity will need to be increased by 1.2 MGD. Additionally, as the World Equestrian Center continues to expand, more public access reuse opportunities are expected to become available, which may result in reduced restricted-access disposal needs.

6.3.2 Silver Springs Shores WRF

The Silver Springs Shores WRF is on an approximately 504-acre parcel owned by Marion County. The WRF is at the northeast corner of the parcel, the RIBs are immediately to the west of the WRF, and the sprayfield is immediately to the south of the WRF. The WRF site is approximately 22 acres, the RIB site is approximately 33 acres (with a wetted area of 8 acres), and the sprayfield site is approximately 155 acres (with a wetted area of 130 acres). Figure 6-1 shows, when adjusting for appropriate buffers, that approximately 232 acres are available for development.

If the projected flows through the 20-year planning horizon are achieved, the Silver Springs Shores WRF effluent management system will need to expand to at least 4 MGD by 2040.

The current permitted effluent disposal capacity is 2.75 MGD; approximately 1.25 MGD of additional disposal capacity is needed. The following options are proposed to meet additional effluent disposal capacity requirements. Each option can individually meet the capacity requirements, or a combination thereof may be pursued contingent upon MCUD preferences:

- Sprayfield
  - The existing sprayfield has a wetted area of 130 acres and 1 MGD of permitted disposal capacity.
  - The hydraulic loading rate (HLR) at the existing sprayfield is permitted at 2 inches per week.
  - Based on the same HLR, approximately 163 acres of wetted sprayfield area is required to dispose of an additional 1.25 MGD. Alternatively, the site could be evaluated for a potential rerating to increase capacity at the existing sprayfield.
- RIBs
  - The existing RIB site has four RIBS, 2 acres each, totaling 8 acres of wetted area and 0.5 MGD of permitted disposal capacity.
  - The HLR at the existing RIB site is permitted at 2.3 inches per day.
  - Based on the same HLR, approximately 20 acres of wetted RIB area is required to dispose of an additional 1.25 MGD. Alternatively, the site could be evaluated for a potential rerating to increase capacity at the existing RIBs.
- Public Access Reuse
  - The existing public access reuse system serves three golf courses and other landscape irrigation with a 1.25-MGD permitted disposal capacity.
  - 1.25 MGD of new public-access reuse customers are needed to meet the additional demand.

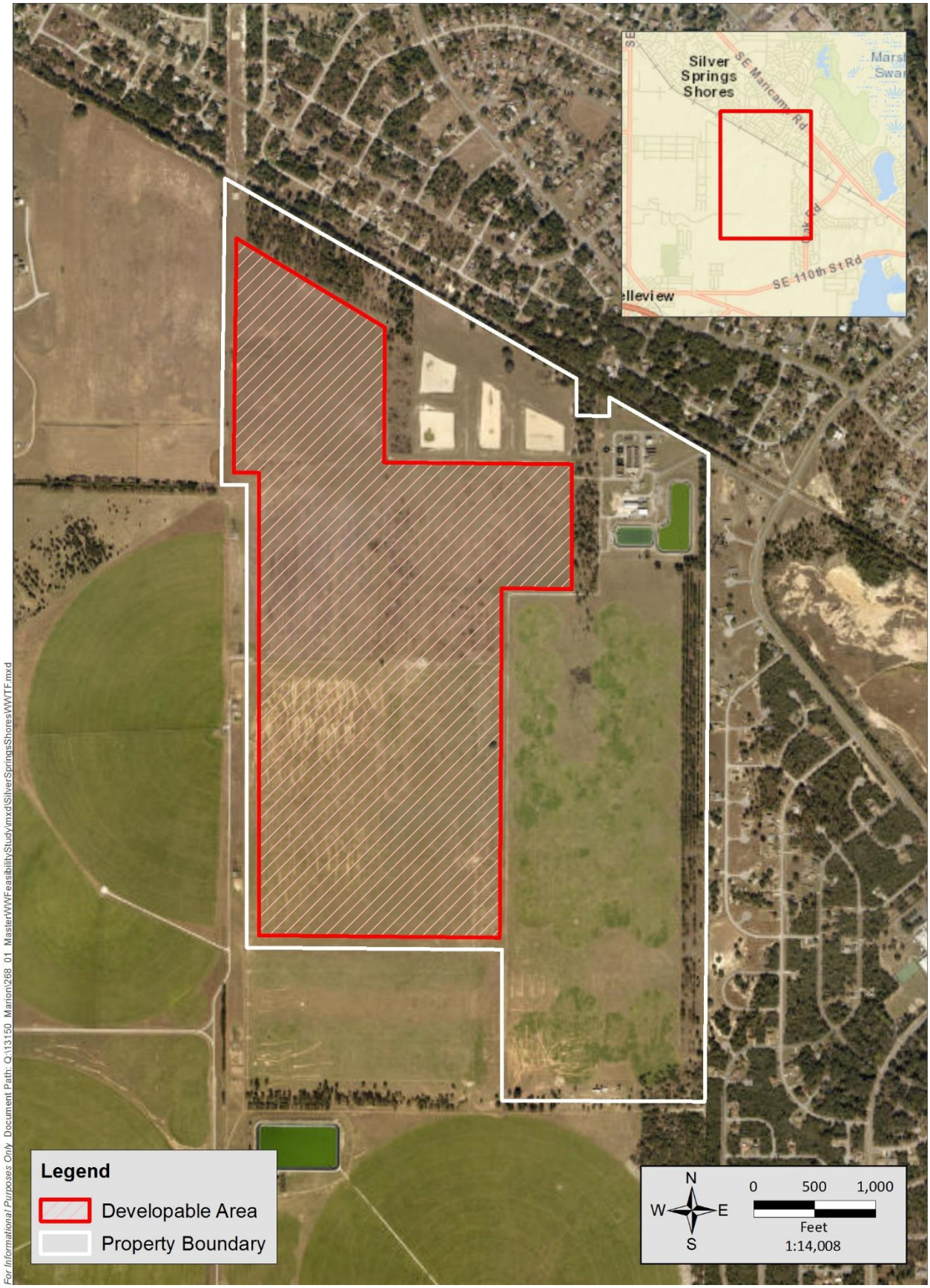
6.3.3 Cost Estimates of Effluent Disposal Options

Using a sprayfield budget estimate of $20,000 per acre based on recent costs of similarly sized projects, construction cost of the sprayfield expansion option for the Silver Springs Shores WRF is estimated as $3,260,000 in 2020 dollars, assuming a 163-acre expansion.

Using a budget estimate of $75,000 per acre based on recent costs of similarly sized projects, construction cost of the RIB expansion option for the Silver Springs Shores WRF is estimated as $1,500,000 in 2020 dollars, assuming a 20-acre expansion.

Cost estimates for an expanded public access reuse system are heavily dependent on the location of the customer, the size of the pipe, and how many pump stations may be required.

Figure 6-1 Silver Springs Shores WRF

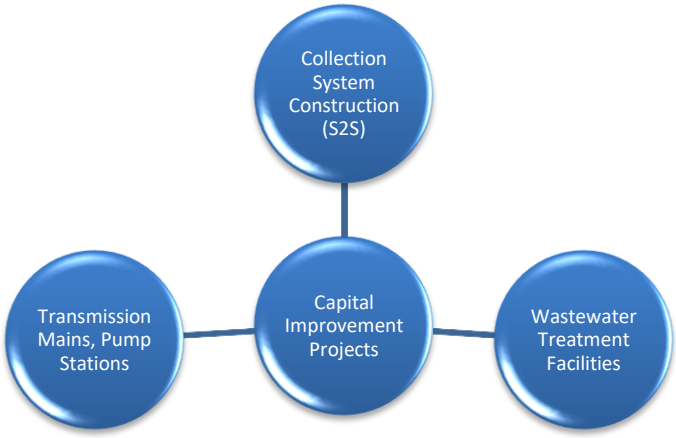


7 SUMMARY OF RECOMMENDED IMPROVEMENTS

This chapter summarizes the MCUD wastewater CIP projects identified in Chapters 4 through 6. The EOPCCs were estimated in 2020 dollars and are considered feasibility-level Class 4 estimates in accordance with ASTM E2516 Standard Classification for Cost Estimate Classification System. The cost opinion's accuracy range of accuracy of -20 to +30 percent.

The CIP includes S2S collection system construction, S2S connections, a new transmission main, pump station upgrades, a transmission main upgrade, and a WWTF expansion. WWTF upgrades to reach low-level nitrogen removal are also referenced in this report but are not included in the CIP because they are not necessary to meet the requirement of the OSTDS remediation plan. The expected schedule and proposed sequencing for implementation of the projects are presented in terms of 5-year, 10-year, 15-year, and 20-year improvement plans.

Wastewater collection system projects included in this CIP are the five PPA S2S projects recommended for implementation, all of which involve the construction of a new collection and transmission system; existing collection systems will not be impacted by proposed projects in the next 20 years. Cost factors such as State Revolving Fund origination fees, Davis-Bacon rates, capitalized interest, and inflation are not included in this chapter but are considered in Chapter 8.



7.1 COLLECTION SYSTEM CONSTRUCTION – SEPTIC TO SEWER

Collection system construction over the 20-year planning horizon includes projects related to the conversion of septic systems to centralized sewer as identified in the 5-year, 10-year, 15-year, and 20-year improvement plans. To address the nitrogen-reduction requirements of the BMAP, an aggressive S2S conversion rate of approximately 650 parcels per year was assumed to be the maximum level of S2S conversion feasible for the County. At this proposed rate, the PPAs selected for remediation include those prioritized in Section 3.3 – DC, DH, DI, DK, and DL.

To fully meet the requirements of the BMAP, the remaining 128 PPAs should be converted to ATUs within the 20-year planning period.

The PPAs selected for S2S conversation were included in the following CIP planning periods:

- DL Pilot Project, Phase 1, and Phase 2: 5-year and 10-year.
- DH: 10-year.
- DI Phases 1 and 2: 10-year and 15-year.
- DK Phases 1 and 2: 15-year and 20-year.
- DC: 20-year.

The new collection system projects presented in Chapter 10 include the estimated connection year and cost for a gravity collection system and associated transmission system required to connect to the existing centralized wastewater system. Appendix I includes Project Sheets with detailed figures and additional information for each collection system S2S project. Costs were determined on a per-lot basis using unit costs for a gravity sewer connection and connecting transmission main. Each cost includes:

- Septic tank abandonment.
- On-lot connections.
- Gravity collection system piping and manholes.
- Sewer laterals.
- Transmission system piping (if necessary).
- Lift stations.
- Full depth pavement and sod restoration.
- Contractor overhead and profit.
- Sitework, mobilization/demobilization, maintenance of traffic, and dewatering.
- Payment plus performance bond.

7.2 Transmission Mains and Pump Stations

Transmission main and pump station improvements, and the construction of a new transmission main, refers to the piping (force mains) and lift stations proposed to connect project areas identified in the improvement plans to the County's existing centralized wastewater or to accommodate the additional flow downstream. The location, implementation cost, and proposed implementation year for each transmission main and pump upgrade are presented in Chapter 10. The schedule, size, and route of the recommended transmission main and pump station projects were based on modeling results as discussed in Chapter 4. Appendix I includes Project Sheets with detailed figures and additional information for each transmission main and pump station project. The costs of these projects included unit costs for:

- Force main piping.
- Pump modifications and upgrades.

7.3 Wastewater Treatment Facilities

The Northwest Regional and Silver Springs Shores wastewater treatment facility expansions are already planned by the County and, therefore, are not included in the overall CIP. The additional Silver Springs Shores WRF expansion is expected to be implemented between the 5-year and 10-year planning periods based on the proposed rate of S2S conversion.

8 FINANCIAL FEASIBILITY PLAN AND LEGAL REVIEW COORDINATION

One objective of the Master Wastewater Feasibility Report is to develop an affordable and realistic funding strategy that apportions just, equitable, and affordable costs to property owners while not having an adverse effect on existing MCUD ratepayers. This Chapter develops a funding plan and roadmap based on the County's service area characteristics. The constraints of this goal include uncertainty of outside funding sources, construction cost schedules, and public acceptance.

8.1 AFFORDABILITY

The water/wastewater industry has attempted to define the concept of affordability. The industry literature generally links water and sewer bills to median household income (MHI) statistics. Although an imperfect method, a framework is offered to begin judging the cost of providing a water and sewer service. When affordability is discussed, other factors considered are income, property value, local cost of living, and economic conditions.

The industry literature on affordability has historically calculated the water and sewer bill as a percentage of local MHI statistics. This methodology standardizes affordability comparisons across regions and gauges a utility's "all-in" costs to ratepayers. The all-in utility payments described herein include monthly water and sewer service bills, property assessments, and other methods used to collect utility revenues. For water and sewer services, the benchmark for affordability has historically been set at 4.5 percent of MHI, as discussed in *Developing a New Framework for Household Affordability and Financial Capability Assessment in the Water Section* by Raucher et al. Under this methodology, MCUD would begin with an MHI of $45,371 based on US Census Bureau data for Marion County. In dollars, the 4.5 percent yields $170 in monthly payments ($2,042 annually) to MCUD. The water and sewer monthly utility bill of $75 ($18 for water and $57 for sewer), assuming a residential customer using 4,000 gallons, results in a maximum of $95 per month remaining for sewer assessments and other direct property owner contribution. As noted further in this section, the prospective assessment to property owners is well below this maximum target.

Other factors should be considered in this affordability discussion, as the following discusses.

Property Value: Central sewer adds value to developed and undeveloped properties. In certain situations, septic tank development within neighborhoods can be limited based on proximity to potable drinking-water wells on adjacent lots. These limitations inhibit the ability to construct on these lots and can essentially render them undevelopable, thereby reducing the properties' values. Central sewer eliminates these limitations, and property values across the neighborhood are increased.

Septic Tank Maintenance: Another consideration is the cost avoidance from owning and operating a septic tank along with alleviating risks associated with a septic tank failure. Septic tanks have a limited lifespan and can be costly to repair or replace, especially when compared to MHI levels established above.

Environmental Implications: The future environmental implications from the current level of septic tanks and the additional septic tanks from future development is a primary consideration. With a growing population and an already strained natural waterway system, MCUD can manage growth and future wastewater treatment by making central sewer more widely available, or many residents will be required to make individual upgrades.

8.2 Sewer System Costs

The following subsection summarizes the current value costs of constructing sewer collection systems for the five PPAs recommended for further investigation. Appendix E presents the cost assumptions, development, and individual project area estimates. The cost to develop the sewer collection system for the PPAs in current dollars is approximately $331 million (excluding transmission system costs outside of the PPA boundaries required to connect to the existing transmission system). The PPAs include 12,653 parcels and 7,914 OSTDS. Table 8-1 provides the cost and parcel breakdown for the recommended PPAs.

Table 8-1 Recommended PPAs and Associated Project Costs

PPA	Parcels	OSTDS	Project Costs (without External Transmission)
DC	1,046	929	$33,197,000
DH	1,311	1,108	$40,997,000
DI	1,492	1,185	$36,602,000
DK	4,558	2,831	$116,240,000
DL	4,246	1,861	$103,700,000
Total	12,653	7,914	$330,736,000

8.3 Funding Options

Funding of S2S projects is a critical concern to the County. Constructing a central sewer for as many as 12,653 developed and vacant parcels in just PPAs over the next 20 years is a significant and expensive endeavor. Due to the expense per parcel and recognizing regional environmental benefits, large S2S programs typically require a portion of state or federal grant funding to make the program feasible.

Subsection 8.3.1 outlines grant and appropriation opportunities, as the funding plan includes at least 50 percent grant/appropriation funding. Subsection 8.3.2 outlines that the remaining funding is assumed to be from various County sources.

8.3.1 State Appropriate Funds and Grants

The State Legislature and the Governor's Office have had significant interest in the impact of septic tanks on the state's sensitive water bodies such as Silver Springs and Rainbow River and Springs. FDEP recognizes the financial magnitude of the S2S need in Florida and the support that will be required to address this issue throughout the state. To assist local government in moving S2S programs forward, the State has dedicated funding from both state and federal resources toward the elimination of septic tanks. With proactive lobbying efforts, Marion County is working to be ready to take advantage of grant dollars to mitigate

the cost of S2S projects as we take a proactive approach to protecting our water quality and meeting future regulatory requirements.

State and federal agencies such as water management districts, FDEP, EPA, US Department of Agriculture, and other agencies will often sponsor programs that include grants or loan forgiveness elements that do not require repayment. Although repayment is not required with grant programs, the County may experience a certain level of administrative and other costs pursuing and executing grants.

8.3.2 County Funding Options

The following provides a brief overview of several County or sub-County funding elements for S2S funding consideration. These are ordered from Countywide participation to parcel-specific participation.

Local Option Sales Tax: Marion County voters have historically passed a 1-cent infrastructure sales surtax for infrastructure and public safety. This tax is typically for 4 years. The current sales surtax extends through the end of 2024 and is expected to generate $196 million during this period or $49 million per year. While S2S is not included in the current project list, sewer projects could be added due to their regional environmental benefit. One benefit to sales surtaxes is that visitors and snowbirds participate and help fund these infrastructure projects. If Marion County includes S2S projects in future sales surtax referenda, the use of 3 percent of existing revenue would generate approximately $1.50 million of funding per year.

Since the sales surtax is only approved in four-year increments, such funding would presumably only pay directly for project construction and would not be used for debt service financing of projects since no assurance of future sales tax could be relied upon beyond the four-year period.

Municipal Services Taxing Unit (MSTU): Marion County has an MSTU/Assessment Department that is responsible for implementing and managing more than 50 MSTUs and Municipal Services Benefit Units (MSBUs) within the County. MSTUs are municipal service taxing units funded by ad valorem taxes (based on property values), whereas MSBUs are municipal service benefit units funded by non-ad valorem assessments that are based on benefits and not property value. Many if not all of the existing MSTUs and MSBUs are for certain areas within the County receiving benefits instead of being applied Countywide. No MSTU is assumed to be feasible for S2S at this time, at least on a Countywide level. If such a program is determined to be feasible Countywide, it would likely be limited to planning-level activities and be limited in duration. For parcel-specific assessments, additional information is provided below, which presumably would belong under an MSBU area and would be drawn to parcel-specific areas.

Marion County Utilities Rate Increases: MCUD serves a portion of Marion County, and since a future S2S program would be administered by MCUD and S2S areas would be future MCUD customers, any MCUD rate increases would be paid by the new S2S customers. The rate increases would also be funded by existing MCUD customers that would presumably be receiving some environmental benefit. However, other areas in the County not served by MCUD (e.g., City of Ocala and Belleview residents) would not be contributing to this funding

source. Based on MCUD's FY 2021 budget of $25 million revenue, Table 8-2 shows rate increases that are dedicated to fund new S2S areas could generate the following:

Table 8-2 Potential Funding from MCU Rate Increases

MCU Rate Increase	Annual Revenue ($ million)	% of Funding for 650 Septic Tanks/year
2%	$0.50	2.6%
5%	$1.25	6.4%
10%	$2.50	12.8%

New S2S Rate Margins: Another funding source from new S2S properties is the improved rate margin. Funding from MCUD rate increases as discussed above was limited to those funds generated from rate increases to all customers. For the new S2S areas, the benefit is seen only through these new customers. At current flat monthly rates of $57 for sewer only service, the marginal cost to MCUD to serving these customers can be expected to be much lower than this rate. This financial margin could be earmarked to benefit the S2S program and support a portion of debt service on S2S debt. For example, if the additional operating cost for maintenance and operations for each new S2S customer is $42 per month, a $15 per month margin would be available for MCU to support the S2S program.

As an example, for 6,000 gallons an incremental cost of $42 equates to $7.00 per thousand gallons. This incremental cost allowance would include additional electric for pumping and treatment, maintenance, labor and renewal and replacement reserves.

Marion Mitigation Fund (MMF): The funding sources described above would be part of the MMF. The MMF is to offset direct costs to property owners with S2S conversions, recognizing the wider environmental benefit throughout the County. These County funding sources are distinct from assessments to those properties where central sewer will become available.

Non-ad valorem assessments would likely be administrated through the County's MSBU program as described in the following.

MSBU/Assessment on S2S properties: This represents a non-ad valorem assessment on properties where a central sewer service becomes available. Typically, large S2S programs can only work financially if assessments are mandatory at the time of availability. One difficulty the County will need to address is how vacant parcels would benefit and be charged for S2S availability since a tenet of non-ad valorem assessments is that parcels are benefited. For this analysis, only developed parcels are assumed to receive an assessment when S2S service becomes available. Since only 62 percent of priority areas are currently developed, this is a significant but realistic assumption. Because of affordability constraints, only a portion of total costs could be reasonably allocated to a property assessment. Relying on an affordability analysis targeting an assessment of less than $95 per month, the amount of project financing that could be supported through property assessment is only $42 per month (approximately $8,000 assessment). For the financial model discussed later in this section, a non-ad valorem assessment of $4,500 per single-family property (approximately $24 per month) is assumed based on the relative difference in advanced

onsite treatment systems versus traditional septic tanks. This approach recognizes the cost difference in treatment levels as an appropriate limit on the assessment.

Note: Although the non-ad valorem assessment would be due annually with the property tax payment, the monthly amount will be relevant for property owners that have escrow payments as required with a mortgage. This amount does not include the wastewater capital charges, which is for treatment capacity and transmission costs.

8.4 Financial Forecast and Funding Strategies

A comprehensive S2S financing model was developed for the County. The financing model is used to evaluate the financial viability of sewer expansion projects. The financial model provides input assumptions and projections regarding level of self-sufficiency under various scenarios. After the presented funding strategies were reviewed, a 20-year plan was developed based on achievable funding levels that balances property-owner affordability with funding sources that match well with the infrastructure costs.

The sewer expansion plan was viewed from the County's and the property owner's perspectives. The major cost to the homeowner is the property-owner assessment of $4,500 and the County's existing wastewater capital charge of $3,844 per equivalent residential connection. The proposed assessment amount may be paid up-front, or the fee may be assessed for up to 20 years at a 2.0-percent interest rate. Assuming the property owner takes advantage of the 4.0-percent early-pay discount, this equates to $286 per year or approximately $24 per month. The cost to vacant lots would defer to such time that development occurs.

8.4.1 20-Year Improvement Plan

The total cost to develop the sewer collection system for the five PPAs at current costs is approximately $331 million (excluding external transmission system costs) over the 20-year planning period. To account for inflation, an annual factor of 2.7 percent is applied to the project costs after Year 1. This factor is based on the 5-year historical average annual increase in the Engineering News-Record (ENR) Construction Cost Index. In addition, a 1.0-percent administrative allowance is included to account for County staff time. Table 8-3 provides the 20-year project costs for the recommended PPAs.

The total costs for the five PPAs over the 20-year period, including inflation and an administrative cost allowance, are approximately $432 million. The costs associated with the transmission system improvements necessary for S2S conversion are assumed to be covered by the County's existing wastewater capital charges and other utility funding sources.

Table 8-3 20-Year Inflated Project Costs

Year	Current Dollars ($)	Inflation ($)	Subtotal ($)	Administrative Costs ($)	Total Project Costs ($)
1	16,990,300	0	16,990,300	169,900	17,160,200
2	16,990,300	458,700	17,449,000	174,500	17,623,500
3	16,990,300	929,900	17,920,200	179,200	18,099,400
4	16,990,300	1,413,700	18,404,000	184,000	18,588,000

Year	Current Dollars ($)	Inflation ($)	Subtotal ($)	Administrative Costs ($)	Total Project Costs ($)
5	16,990,300	1,910,600	18,900,900	189,000	19,089,900
6	16,990,300	2,420,900	19,411,200	194,100	19,605,300
7	16,990,300	2,945,000	19,935,300	199,400	20,134,700
8	16,990,300	3,483,300	20,473,600	204,700	20,678,300
9	16,990,300	4,036,100	21,026,400	210,300	21,236,700
10	16,990,300	4,603,800	21,594,100	215,900	21,810,000
11	16,990,300	5,186,800	22,177,100	221,800	22,398,900
12	16,990,300	5,785,600	22,775,900	227,800	23,003,700
13	16,990,300	6,400,600	23,390,900	233,900	23,624,800
14	16,990,300	7,032,100	24,022,400	240,200	24,262,600
15	16,990,300	7,680,700	24,671,000	246,700	24,917,700
16	16,990,300	8,346,800	25,337,100	253,400	25,590,500
17	16,990,300	9,030,900	26,021,200	260,200	26,281,400
18	16,990,300	9,733,500	26,723,800	267,200	26,991,000
19	16,990,300	10,455,100	27,445,400	274,500	27,719,900
20	7,920,100	5,219,100	13,139,200	131,400	13,270,600
Total	330,735,800	97,073,200	427,809,000	4,278,100	432,087,100

During the 20-year planning period, all 7,914 OSTDS within the five PPAs are assumed to be converted to central sewer. In addition, a moderate level of infill growth is assumed for the vacant parcels within the five PPAs. Table 8-4 provides the total projected number of conversions after the 20-year period.

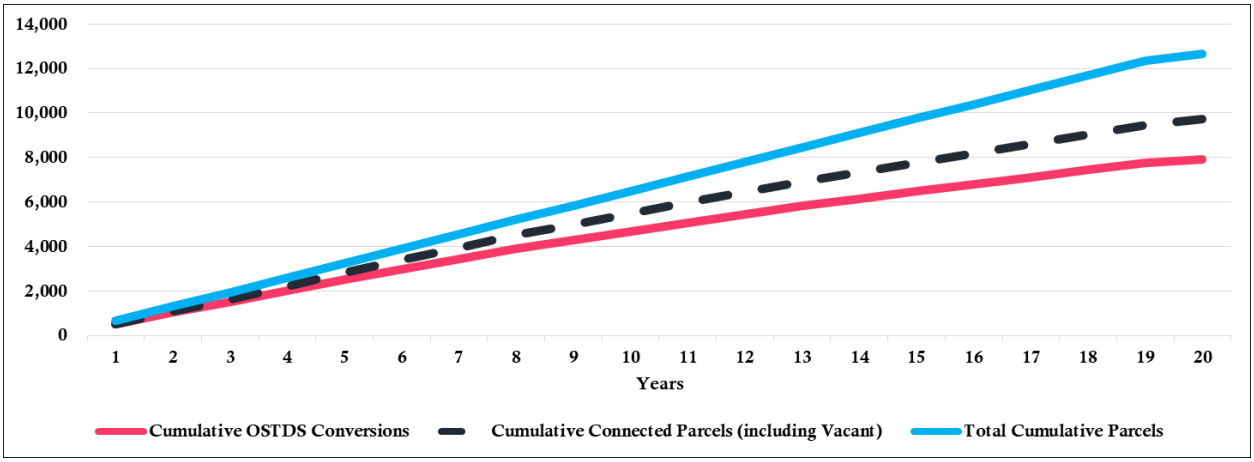
Table 8-4 20-Year Central Sewer Conversions

	Developed	% Developed[1]
Existing	7,914	62.5
20-Year Projection	9,714	76.8

[1]Based on 12,653 parcels within the five PPAs.

Figure 8-1 illustrates the OSTDS conversions, connected parcels assumed (including the vacant parcels), and total parcels overall in the five PPAs over the 20-year planning period.

Figure 8-1 Parcels Converted to Central Sewer



The proposed funding plan assumes that grants and/or legislative appropriations will cover 50 percent of the project costs. The plan also assumes approximately $6.7 million per year from the MMF. The remaining amount not funded from the other sources may be funded through State Revolving Fund (SRF) loan proceeds administered by FDEP. The SRF loan program would be advantageous to MCUD because of the low interest rates currently offered and the program being firmly established in Florida for utilities infrastructure improvements. Table 8-5 summarizes the annual project costs and funding sources for the 20-year sewer improvement plan.

If a portion of the projects is funded through SRF loans, the total new debt borrowed over the 20-year period for the sewer improvement plan is approximately $84 million. Table 8-6 provides the assumptions used for the SRF loan issuances. Each loan covers the remaining project costs (after grants and MMF) for a 3-year period.

The annual debt service associated with the projected SRF loans is assumed to be repaid through a combination of the financial margin generated from new S2S customers and the proposed assessment on S2S properties. As discussed above, $15 per month of margin would be available for MCUD to support the S2S program. In addition, the financial model assumes a non-ad valorem assessment of $4,500 per single-family property. Table 8-7 and Table 8-8 provide the cash flows associated with this analysis, for years 1 through 10 and 11 through 20, respectively, accounting for the annual debt service and revenues generated to support the debt service.

Table 8-5 20-Year Funding Summary

	Year									
	1	2	3	4	5	1 – 5 Total	6 – 10 Total	11 – 15 Total	16 – 20 Total	20-year Total
Project Costs	$17.2 M	$17.6 M	$18.1 M	$18.6 M	$19.1 M	$90.6 M	$103.5 M	$118.2 M	$119.9 M	$432.1 M
Grants	$8.6 M	$8.8 M	$9.0 M	$9.3 M	$9.5 M	$45.3 M	$51.7 M	$59.1 M	$59.9 M	$216.0 M
MMF	$6.7 M	$6.7 M	$6.7 M	$6.7 M	$6.7 M	$33.3 M	$33.3 M	$33.0 M	$33.0 M	$132.5 M
SRF	$1.9 M	$2.2 M	$2.4 M	$2.6 M	$2.9 M	$12.0 M	$18.5 M	$26.1 M	$26.9 M	$83.5 M
Total	$17.2 M	$17.6 M	$18.1 M	$18.6 M	$19.1 M	$90.6 M	$103.5 M	$118.2 M	$119.9 M	$432.1 M

Table 8-6 20-Year SRF Loan Issuances

Description	SRF Loan 1 (Years 1 – 3)	SRF Loan 2 (Years 4 – 6)	SRF Loan 3 (Years 7 – 9)	SRF Loan 4 (Years 10 – 12)	SRF Loan 5 (Years 13 – 15)	SRF Loan 6 (Years 16 – 18)	SRF Loan 7 (Years 19 – 20)
Construction Reimbursement	$6,491,550	$8,691,600	$11,074,850	$13,756,300	$16,602,550	$19,631,450	$7,295,250
Loan Costs[1]	$133,650	$179,000	$228,050	$283,300	$341,950	$404,250	$150,250
Capitalized Interest[2]	$193,000	$258,400	$329,200	$408,900	$493,500	$583,500	$216,900
Total Loan Amount	$6,818,200	$9,129,000	$11,632,100	$14,448,500	$17,438,000	$20,619,200	$7,662,400
Term (years)	20	20	20	20	20	20	20
Interest Rate	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Annual Debt Service per Loan	$415,300	$556,100	$708,500	$880,100	$1,062,200	$1,255,900	$466,700
Cumulative Annual Debt Service	$415,300	$971,400	$1,679,900	$2,560,000	$3,622,200	$4,878,100	$5,344,800

[1]Loan issuance costs assumed at 2.0% of project costs.

[2]Reflects 3 years of capitalized interest.

Table 8-7 Years 1 – 10 Cash Flow and Debt Service Coverage

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assessment Revenue	$143,100	$304,400	$461,000	$636,800	$817,300	$1,002,500	$1,182,300	$1,367,100	$1,534,700	$1,706,700
Rate Margin	0	31,100	96,700	194,200	296,100	398,900	504,700	608,600	710,500	806,400
Total Revenue Available for Debt Repayment	$143,100	$335,500	$557,700	$831,000	$1,113,400	$1,401,400	$1,687,000	$1,975,700	$2,245,200	$2,513,100
SRF Debt Service Payments	$0	$0	$0	$415,300	$415,300	$415,300	$971,400	$971,400	$971,400	$1,679,900
Surplus	$143,100	$335,500	$557,700	$415,700	$698,100	$986,100	$715,600	$1,004,300	$1,273,800	$833,200
Debt Service Coverage[1]	N/A	N/A	N/A	2.00	2.68	3.37	1.74	2.03	2.31	1.50
Available Reserves	$143,100	$478,600	$1,036,300	$1,452,000	$2,150,100	$3,136,200	$3,851,800	$4,856,100	$6,129,900	$6,963,100

[1]A debt service coverage of 1.15x is targeted so that the S2S funding plan does not dilute MCUD's debt service coverage that existing ratepayers are funding.

Table 8-8 Years 11 – 20 Cash Flow and Debt Service Coverage

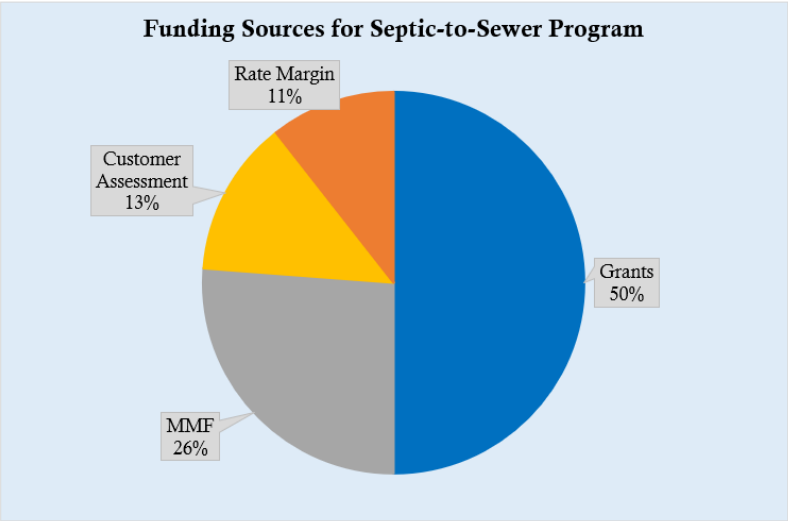
Description	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Assessment Revenue	$1,883,100	$2,064,400	$2,238,400	$2,404,200	$2,574,600	$2,749,700	$2,929,500	$3,114,000	$3,303,600	$3,415,400
Rate Margin	898,600	986,800	1,075,000	1,161,200	1,243,600	1,322,100	1,398,600	1,475,100	1,551,600	1,628,100
Total Revenue Available fo Debt Repayment	$2,781,700	$3,051,200	$3,313,400	$3,565,400	$3,818,200	$4,071,800	$4,328,100	$4,589,100	$4,855,200	$5,043,500
SRF Debt Service Payments	$1,679,900	$1,679,900	$2,560,000	$2,560,000	$2,560,000	$3,622,200	$3,622,200	$3,622,200	$4,878,100	$4,878,100
Surplus	$1,101,800	$1,371,300	$753,400	$1,005,400	$1,258,200	$449,600	$705,900	$966,900	($22,900)	$165,400
Debt Service Coverage[1]	1.66	1.82	1.29	1.39	1.49	1.12	1.19	1.27	1.00	1.03
Available Reserves	$8,064,900	$9,436,200	$10,189,600	$11,195,000	$12,453,200	$12,902,800	$13,608,700	$14,575,600	$14,552,700	$14,718,100

[1]A debt service coverage of 1.15x is targeted so that the S2S funding plan does not dilute MCUD's debt service coverage that existing ratepayers are funding.

8.4.2 Summary of Funding Scenarios

Figure 8-2 illustrates the expected funding source percentages based on the 20-year plan identified in the S2S financing model. The pie chart reflects the total cost in current dollars over the 20-year period of approximately $331 million.

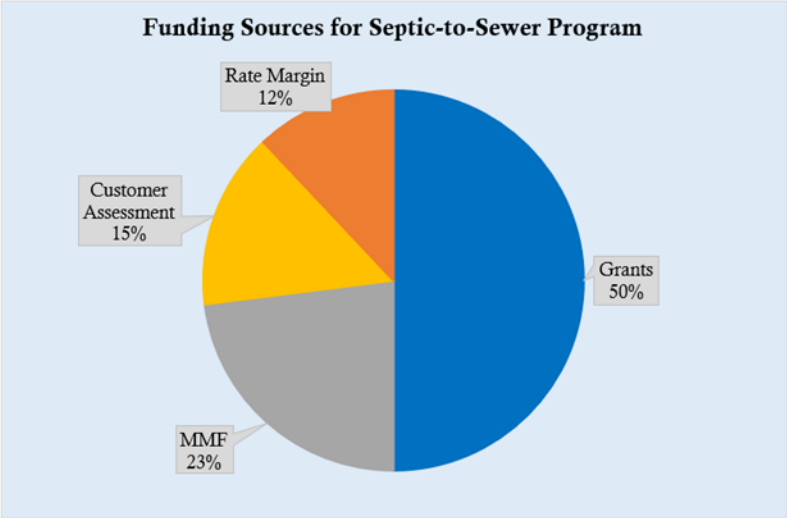
Figure 8-2 20-Year Expected S2S Funding Sources



Funding Sources	Inputs
Grants	50.0%
Customer Assessment	$4,500
Rate Margin	$15
County-wide Rate Increase	0.0%
Local Option Sales Tax/Year	$1,500,000
MMF (other County sources)/Yea	$2,832,750
Avg. Cost per Parcel	$26,139
Parcels/Year	633
Total Cost (20-Year Period)	$330,736,000
Total Parcels (including Vacant)	12,653
% Developed	76.8%
Parcels Developed	9,714

Several other scenarios were developed for the County based on various assumptions. One significant assumption was the number of parcels where central sewer would be constructed each year. Figure 8-3 shows a scenario that was presented to the County Commission at the April 2021 workshop and summarizes a funding scenario with a limited central sewer expansion of only 100 parcels per year.

Figure 8-3 20-Year Expected S2S Funding Sources Presented to BOCC



Funding Sources	Inputs
Grants	50.0%
Customer Assessment	$4,500
Rate Margin	$15
County-wide Rate Increase	0.0%
Local Option Sales Tax/Year	$0
MMF (other County sources)/Yea	$690,000
Avg. Cost per Parcel	$30,000
Parcels/Year	100
Total Cost (20-Year Period)	$60,000,000
Total Parcels (including Vacant)	2,000
% Developed	100.0%
Parcels Developed	2,000

9 PUBLIC EDUCATION PLAN AND PUBLIC INPUT

The public education plan for the Marion County Wastewater Feasibility Study included a series of meetings for stakeholders, special interest groups, and the general public.

The stakeholder meetings were focused on engagement with the other public utility providers within Marion County, including the Cities of Belleview and Ocala and the Florida Governmental Utility Authority (FGUA) which provides utility service in Dunnellon. Individual meetings were held on October 2, 2019 with Belleview and FGUA and October 3, 2019 with the City of Ocala. The meetings were held to review the purpose of the project and scope of the study, identify any ongoing or planned projects from the stakeholders that should be incorporated into the study results, solicit feedback on key influencers in their respective service areas, and identify any specific areas of concern held by the stakeholders. Projects identified by the stakeholders are incorporated in Section 2.3. Influencers identified during these meetings were included in the invitations to the special interest group meetings.

On January 23, 2020, three special interest group meetings were held at the Marion County Growth Services office. The three special interest areas focused on the development community, civic organizations, and environmental interests. Each two-hour meeting included a presentation (Appendix H) and an interactive discussion regarding the Florida Springs and Aquifer Protection Act requirements, goals of the master wastewater feasibility study, and steps in the process.

After the special interest group meetings, the County established a website page dedicated to communicating information regarding the study. There was also a dedicated email address where interested parties could ask questions about the project. The webpage and email continue to be monitored by County staff.

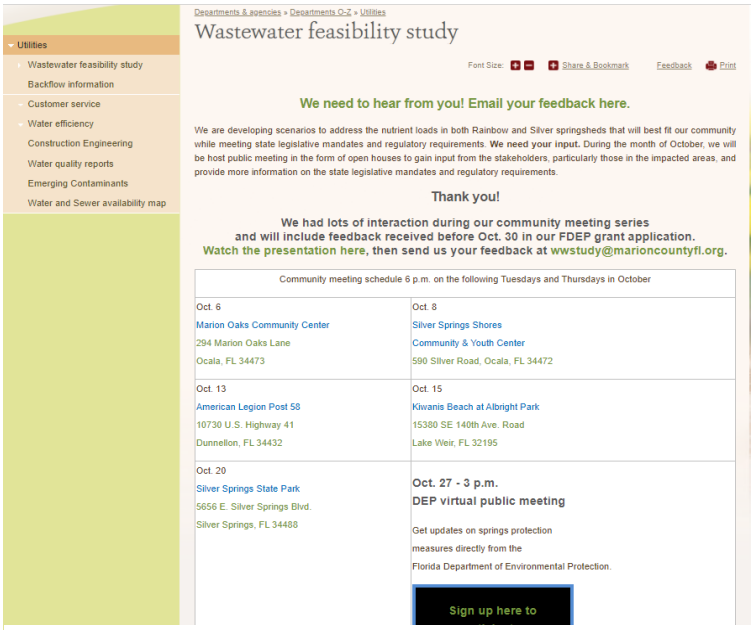


Figure 9-1 MCUD Wastewater Feasibility Study Webpage

As planning moved forward for the public outreach meetings, COVID-19 became a reality that impacted the timeline associated with this project. Public meetings were put on hold. As the state restrictions were lifted, planning resumed on the public meetings. Five in person public meetings were held in October 2020 (6th, 8th, 13th, 15th, and 20th) in different geographic locations around the County to provide reasonable access for all residents interested in attending. The meetings were conducted in an open-house format with appropriate social distancing and safety requirements in place.

The Marion County Public Relations Department implemented a focused information campaign to make sure residents were aware of the various public meeting opportunities. The outreach mechanisms used included the following:

- Social media posts, events, and videos.
- County Commissioner appearances on local radio talk shows WOCA (weekly) and 97.3FM (first and third Thursday of each month).
- Dedicated webpage.
- Dedicated email.
- Article submissions to local magazines.
- HOA newsletter announcements.
- Interviews with local newspapers.
- Direct communication to local activist groups.
- Direct invitations to local and regional legislative delegates.
- Responding to residents via phone, email, and social media messaging.

Members of the public were requested (but not required) to sign-in to document attendance and develop a list of interested parties the County can use for future information dissemination. For each of the public meetings, 15 information boards were set up around the room in four stations for the public to peruse and ask questions of Jones Edmunds and County staff positioned at each station. A looping PowerPoint presentation with the same information was also set up in the room. Appendix H presents copies of the sign-in sheets (redacted to protect citizen information), information boards, and presentation. Once the members of the public had the opportunity to review the informational stations the public was invited to fill out a survey to obtain feedback on the issues, concerns and questions they had about the project. More than 100 residents attended the 5 meetings.

In addition to the five in-person open houses, the County hosted an online version of the event which included a narrated presentation with an opportunity for the public to submit questions and fill out the survey online. More than 360 members of the public participated in this process.

Table 9-1 summarizes the analytics from the County's three social media platforms – Facebook, Twitter, and Instagram.

Table 9-1 Marion County Social Media Analytics

Date	Social Media Post Type	Impressions	Reach	Engagements	Reactions	Comments	Shares	Saves	Minutes viewed
10/26/20	Online Presentation	9,148	12,133	366	63	7	10	3	N/A
10/20/20	Pre-Event Targeted Promo, Silver Springs State Park	5,920	9,176	55	11	1	4	0	N/A
10/15/20	Pre-Event Targeted Promo, Lake Weir	5,479	8,487	71	10	5	1	0	N/A
10/13/20	Pre-Event Targeted Promo, Dunnellon	6,363	9,492	85	9	4	1	0	N/A
10/12/20	Pre-Event Targeted Promo, Dunnellon	5,203	4,569	144	18	2	5	0	N/A
10/08/20	Pre-Events Promo Video	20,042	10,359	1,996	77	61	47	0	1,554
10/07/20	Pre-Event Targeted Promo, Silver Springs Shores	6,154	9,236	131	11	12	4	0	N/A
10/06/20	Pre-Event Targeted Promo, Marion Oaks		3,702	222	33	13	0	0	N/A
10/01/20	Pre-Events Promo Video	48,041	32,023	3,436	176	103	133	0	5,794
	Total	106,350	99,177	6,506	408	208	205	3	7,348

At the end of each meeting, surveys were available for public feedback. We received 55 surveys from the open house attendees. The survey consisted of nine questions and a comment section. The intent of the survey was to gain insight into stakeholder knowledge and concerns as it relates to the requirements associated with the Florida Springs and Aquifer Protection Act and OSTDSs. Generally, the survey results indicated that the public felt:

- Septic systems are a problem as well as other sources of nutrient loading such as fertilizer and livestock waste.
- Centralized sewer is preferable to decentralized sewer.
- More information is desired about the which homes will specifically be impacted and the associated costs.
- Cost is the biggest concern moving forward, although the residents attending the Lake Weir Open House expressed a willingness to pay more to obtain centralized sewer in their area.

90%

90% of respondents feel very or somewhat strongly about protecting the water quality of Rainbow and/or Silver Springs

75%

More than 75% of the respondents preferred centralized wastewater treatment systems over decentralized wastewater treatment systems

Appendix H provides a copy of the survey, a full summary of the survey results, and a copy of all surveys submitted.

The final public outreach event was a presentation of the results of the study (including the public outreach activities) to the Marion County Board of County Commissioners (BOCC) on April 14, 2021. The presentation included an overview of the requirements of the Florida Springs and Aquifer Protection Act and the associated challenge faced by the county related to septic systems in the consolidated Rainbow Springs and Silver Springs BMAP and the associated PFAs. Prioritized areas considered for S2S conversion were discussed as well as the associated financial analysis and funding alternatives. The BOCC had extensive discussion regarding the financial impacts to residents and how best to address that issue. The workshop culminated in a request for BOCC direction on the following items:

- Approval on identified priority areas and initiation of design.
- Direction on acceptable internal funding mechanisms.
- Direction on mandatory connection.
- Direction on the FDEP connection and septic upgrade grant program within the County.
- Direction on pursuit of grant dollars in support of priority projects.
- Approval to transmit the report to FDEP.

The Board approved the priority project areas identified and as prioritized in the report. They also requested that the County Utilities Department develop a small pilot project to walk the County through a S2S project process to assist the County in making decisions on key items including funding, connection requirements and grant pursuits. The Board would also like to see how public outreach impacts public sentiment in the pilot area. The County is interested in discussing the connection grant program to see how this program can support cost offsets to residents financially impacted by the state legislation. Concerns were

also expressed by the BOCC regarding the difference in the grant allocations offered by SWFWMD versus SJRWMD, as a County bifurcated by district lines, and regarding fairness to all its residents. A recording of the BOCC presentation can be found at this link: http://marionfl.granicus.com/player/clip/249?view_id=1&meta_id=18592&redirect=true.

10 CAPITAL IMPROVEMENT PLAN (RECOMMENDED PLAN)

A recommended project phasing schedule has been developed for the capital improvement projects detailed throughout the previous chapters, along with cost estimates for each project. Table 10-1 summarizes the detailed project information for each project for collection system construction (S2S projects) and transmission mains and pump stations. Appendix I provides detailed capital improvement project sheets that show project locations, proposed improvements, and total estimated project costs.

Table 10-1 Capital Improvement Plan Project Descriptions

Project Name	Predecessor CIP	Description	Est. Construction Time	Project Area Served	No. of OSTDS	No. of Total Lots	TN Removed (lb/yr)	Gravity Main Length (feet)	Force Main Length (feet)	EOPCC	Cost Per Lot
Collection System – S2S											
PPA DL Pilot Project	None	This project includes removal of septic systems from service and construction of a centralized sewer system. One lift station will be constructed that will discharge through a common force main to an existing force main on SE Maricamp Road.	Year 1 - Year 5	SSS WRF	100	100	794	TBD	TBD	TBD	TBD
PPA DL Phase 1	PPA DL Pilot Project	This project includes removal of septic systems from service and construction of a centralized sewer system. The seven lift stations will be constructed that will discharge through a common force main to an existing force main on SE Maricamp Road.	Year 1 - Year 5	SSS WRF	1,414	3,150	12,572	122,340 / 30,627	33,430	$79,958,032	$25,384
PPA DL Phase 2	PPA DL Phase 1	This project includes removal of septic systems from service and construction of a centralized sewer system. Five lift stations will be constructed that will discharge through a common force main to an existing force main on SE Maricamp Road.	Year 5 - Year 10	SSS WRF	447	996	3,975	94,960 / 23,773	10,570	$25,281,968	$25,384
PPA DH	None	This project includes removal of septic systems from service and construction of a centralized sewer system. Five lift stations will be constructed that will discharge through a common force main to an existing force main on Baseline Road.	Year 5 - Year 10	SSS WRF	1,108	1,311	13,172	52,200 / 52,200	16,000	$41,557,000	$31,699
PPA DI Phase 1	None	This project includes removal of septic systems from service and construction of a centralized sewer system. Two lift stations will be constructed that will discharge through a common force main to an existing force main on Baseline Road.	Year 5 - Year 10	SSS WRF	749	943	6,433	31,810 / 7,952	7,584	$23,399,294	$24,814
PPA DI Phase 2	PPA DI Phase 1	This project includes removal of septic systems from service and construction of a centralized sewer system. Two lift stations will be constructed that will discharge through a common force main to an existing force main on Baseline Road.	Year 10 - Year 15	SSS WRF	436	549	3,745	43,390 / 10,848	4,416	$13,622,706	$24,814
PPA DK - Phase 1	None	This project includes removal of septic systems from service and construction of a centralized sewer system. Nine life stations will be constructed that will discharge through a common force main to an existing force main at Pine Road and SE Maricamp Road.	Year 10 - Year 15	SSS WRF	1,678	2,701	14,075	182,456	28,444	$69,877,560	$25,871
PPA DK - Phase 2	PPA DK - Phase 1	This project includes removal of septic systems from service and construction of a centralized sewer system. Four lift stations will be constructed that will discharge through a common force main to an existing force main at Pine Road and SE Maricamp Road.	Year 15 - Year 20	SSS WRF	1,153	1,857	9,677	125,443	19,556	$48,042,440	$25,871
PPA DC	None	This project includes removal of septic systems from service and construction of a centralized sewer system. Five lift stations will be constructed that will discharge through a common force main to an existing force main on Baseline Road.	Year 15 - Year 20	SSS WRF	929	1,046	6,860	41,200 / 41,200	16,000	$33,757,000	$32,272

Project Name	Predecessor CIP	Description	Est. Construction Time	Project Area Served	No. of OSTDS	No. of Total Lots	TN Removed (lb/yr)	Gravity Main Length (feet)	Force Main Length (feet)	EOPCC	Cost Per Lot
Transmission Mains and Pump Stations											
SSS-032 Upgrade	None	The project includes an upgrade at the SSS-032 to increase volume of storage in the wet well in conjunction with a new, short tie-in force main to bypass FHS-002 and send flow directly to EQB-001.	Year 1 - Year 5	SSS WRF	N/A	N/A	-	-	20	$1,750,000	-
EQB-001 Bypass FM and Pump Upgrades	None	The project includes the construction of 5,500 LF of 16-inch force main along Maricamp Road, connecting the existing 12-inch force main to the SSS WRF. One pump modification and six pump upgrades are proposed due to the increased head conditions from the new bypass: pump modification at FHS-002 and pump upgrades at CAS-001, FHS-001, SSS-009, SSS-025, SSS-032, and WMT-002.	Year 5 - Year 10	SSS WRF	N/A	N/A	-	-	5,500	$1,500,000	-
SE 58th Avenue FM Upgrade	PPA DH, PPA DI	The project includes an upgrade to the existing 8-inch force main along SE 58th Avenue, from the PPA DI project point of connection to the existing 12-inch force main on Maricamp Road, to handle additional flows from the PPA DH and PPA DI projects.	Year 10 - Year 15	SSS WRF	N/A	N/A		-	5,250	$600,000	-

*When two values are present, the first is 8-inch diameter and the second is 10-inch diameter.

Appendix A

Private Package Plants in Marion County

Appendix A

Private Package Plants in Marion County

Facility ID	Facility Name	Managing Entity	BMAP	PFA	Facility Type*
FLA012687	103rd Street Square Center WWTF	103rd Street Square Center WWTF	Rainbow	–	DW
FLA010735	Associated Grocers of Florida	Associated Grocers of Florida	Silver	Silver	DW
FLA010661	Belleview Santos Elementary School WWTF	Belleview Santos Elementary School WWTF	Silver	Silver	DW
FLA010750	Big Lake Village WWTF	Big Lake Village WWTF	Silver	–	DW
FLA968714	Brown Septage Facility	Brown Septage Facility	Rainbow	–	RES
FLA010689	Camp Sonlight	Camp Sonlight	Silver	–	DW
FLA010771	Cedar Hills WWTF	Cedar Hills WWTF	Silver	Silver	DW
FLG110396	CEMEX Construction Materials FL LLC – Ocala North Ready Mix	CEMEX Construction Materials FL LLC – Ocala North Ready Mix	Silver	Silver	CBP
FLA012708	Centers, Inc. the	Centers, Inc. the	Rainbow	–	DW
FLA012707	Circle Square Shopping Center WWTF	Circle Square Shopping Center WWTF	Rainbow	–	DW
FLA330728	Circle Square Woods RAF	Circle Square Woods RAF	Rainbow	–	RAF
FLA012665	Classic Oaks Village Mobile Home Park (MHP) LLC	Classic Oaks Village MHP LLC	Rainbow	–	DW
FLA010745	Cliftwood MHP WWTF	Cliftwood MHP WWTF	Silver	Silver	DW
FLA780863	Couture Farms BTF	Couture Farms BTF	Silver	–	RES
FLA012680	Crownwood WWTF	Crownwood WWTF	Rainbow	–	DW
FLA012662	Crystal Springs MHP WWTF	Crystal Springs MHP WWTF	Rainbow	–	DW
FLA279323	Davita – Ocala North Kidney Center	Davita – Ocala North Kidney Center	Silver	–	IW
FLA010763	Days Inn – Ocala West WWTF	Days Inn – Ocala West WWTF	Silver	–	DW
FLA012663	Dogwood Acres MHP	Dogwood Acres MHP	Rainbow	–	DW
FLA012658	Dunnellon High School WWTF	Dunnellon High School WWTF	Rainbow	Rainbow	DW

Facility ID	Facility Name	Managing Entity	BMAP	PFA	Facility Type*
FLA010674	East Marion Elementary School WWTF	East Marion Elementary School WWTF	–	–	DW
FLA305502	Emergency One Inc	Emergency One Inc	Rainbow	–	IW
FLA012706	Fairfield Village of Ocala WWTF	Fairfield Village of Ocala WWTF	Rainbow	–	DW
FLA012698	Falls of Ocala MHP WWTF	Falls of Ocala MHP WWTF	Rainbow	–	DW
FLA010666	Fessenden Elementary School WWTF	Fessenden Elementary School WWTF	Silver	–	DW
FLA010739	Florida Elks Youth Camp	Florida Elks Youth Camp	–	–	DW
FLA770221	FM Beef Products (FKA Adena Meat Products)	FM Beef Products (FKA Adena Meat Products)	–	–	IW
FLA010710	Forest Center Shopping Plaza WWTF	Forest Center Shopping Plaza WWTF	–	–	DW
FLA010665	Fort McCoy School K–8	Fort McCoy School K–8	Silver	–	DW
FLA012664	Foxwood Farms MHP WWTF	Foxwood Farms MHP WWTF	Rainbow	–	DW
FLA010730	G & S Fruit Packers	G & S Fruit Packers	Silver	–	IW
FLA012696	Golden Hills MHP WWTF	Golden Hills MHP WWTF	Rainbow	–	DW
FLA010765	Golden Holiday WWTF	Golden Holiday WWTF	Silver	Silver	DW
FLA010770	Grand Lake RV Resort WWTF	Grand Lake RV Resort WWTF	Silver	–	DW
FLA010670	Harbor View Elementary School WWTF	Harbor View Elementary School WWTF	Silver	–	DW
FLA010703	Hilltop Estates	Hilltop Estates	Silver	–	DW
FLA317217	Homer Gary South	Homer Gary South	Silver	Silver	RAF
FLA012670	Howard Johnson Inn WWTF	Howard Johnson Inn WWTF	Rainbow	–	DW
FLA012716	I-75 FDOT Rest Area WWTF	I-75 FDOT Rest Area WWTF	Silver	–	DW
FLA017146	KMC Citrus Enterprises	KMC Citrus Enterprises	Silver	–	IW
FLA010728	Lake Bryant Mobile Home & Recreational Vehicle (RV) Park WWTF	Lake Bryant Mobile Home & RV Park WWTF	–	–	DW
FLA010723	Lake Ocklawaha RV Resort WWTF	Lake Ocklawaha RV Resort WWTF	–	–	DW
FLA010709	Lake View Woods WWTF	Lake View Woods WWTF	Silver	–	DW

Facility ID	Facility Name	Managing Entity	BMAP	PFA	Facility Type*
FLA010688	Lake Waldena Resort WWTF	Lake Waldena Resort WWTF	Silver	–	DW
FLA010662	Lake Weir Middle School	Lake Weir Middle School	Silver	–	DW
FLA010722	Landfair WWTF	Landfair WWTF	Silver	Silver	DW
FLA012668	Magnolia Garden Estates WWTF	Magnolia Garden Estates WWTF	Rainbow	–	DW
FLA010764	Marie's Mobile Home Park WWTF	Marie's Mobile Home Park WWTF	Silver	Silver	DW
FLA010789	Marion Correctional Institute WWTF	Marion Correctional Institute WWTF	Silver	–	DW
FLA012699	Marion Landing	Marion Landing	Rainbow	–	DW
FLA010716	Mill Dam MHP WWTF	Mill Dam MHP WWTF	–	–	DW
FLA010721	Motor Inns/Ocala WWTF	Motor Inns/ Ocala WWTF	Silver	–	DW
FLA010708	Nautilus Mobile Home & RV Park WWTF	Nautilus Mobile Home & RV Park WWTF	Silver	Silver	DW
FLA010687	Nelson's Fish Camp WWTF	Nelson's Fish Camp WWTF	–	–	DW
FLA010754	Noorani Hotel & Conference Center WWTF	Noorani Hotel & Conference Center WWTF	Silver	–	DW
FLA010663	North Marion High School	North Marion High School	Silver	–	DW
FLA010664	North Marion Middle School	North Marion Middle School	Silver	–	DW
FLA010693	Oak Bend Manufactured Home Community	Oak Bend Manufactured Home Community	Silver	–	DW
FLA012676	Oak Tree Village and Campground WWTF	Oak Tree Village and Campground WWTF	Rainbow	–	DW
FLA010725	Ocala East Villas WWTF	Ocala East Villas WWTF	Silver	Silver	DW
FLA010715	Ocala Forest Campground	Ocala Forest Campground	–	–	DW
FLA010737	Ocala Jai Alai – WWTF	Ocala Jai Alai – WWTF	Silver	–	DW
FLA012686	Ocala Jockey Club WWTF	Ocala Jockey Club WWTF	Rainbow	–	DW
FLA012667	Ocala RV Camp Resort WWTF	Ocala RV Camp Resort WWTF	Rainbow	–	DW
FLA010773	Ocala Springs Shopping Center WWTF	Ocala Springs Shopping Center WWTF	Silver	Silver	DW
FLA012709	Ocala Sun RV Resort WWTF	Ocala Sun RV Resort WWTF	–	–	DW
FLA010685	On Golden Pond MHP WWTF	On Golden Pond MHP WWTF	Silver	–	DW

Facility ID	Facility Name	Managing Entity	BMAP	PFA	Facility Type*
FLA012683	On Top of the World WWTF	On Top of the World WWTF	Rainbow	–	DW
FLA010784	Our Lucaya	Our Lucaya	Silver	Silver	DW
FLA010705	Paddock Park South WWTF	Paddock Park South WWTF	Silver	–	DW
FLA312240	Pasteur Site	Pasteur Site	Silver	Silver	RAF
FLA016154	Petro PSC Truck Stop WWTF	Petro PSC Truck Stop WWTF	Silver	–	DW
FLA010698	Phoenix Houses of Florida	Phoenix Houses of Florida	Silver	–	DW
FLA017026	Plantation Landing WWTF	Plantation Landing WWTF	Silver	Silver	DW
FLA316474	Premium Waters – Orange Spring Bottling Facility	Premium Waters – Orange Spring Bottling Facility	–	–	IW
FLA012717	Rainbow Springs State Campground WWTF	Rainbow Springs State Campground WWTF	Rainbow	Rainbow	DW
FLA010672	Reddick Collier Elementary School WWTF	Reddick Collier Elementary School WWTF	Silver	–	DW
FLA012660	Reddick RV WWTF	Reddick RV WWTF	Rainbow	–	DW
FLA010696	Robins Nest RV Park WWTF	Robins Nest RV Park WWTF	Silver	–	DW
FLA010757	Rolling Greens MHP WWTF	Rolling Greens MHP WWTF	Silver	Silver	DW
FLA012657	Romeo Elementary School WWTF	Romeo Elementary School WWTF	Rainbow	Rainbow	DW
FLA282995	Royal Oak Enterprises	Royal Oak Enterprises	Silver	Silver	IW
FLA012694	Saddle Oak Club MHC WWTF	Saddle Oak Club MHC WWTF	Rainbow	–	DW
FLA012682	Sateke Village WWTF	Sateke Village WWTF	Rainbow	Rainbow	DW
FLA010669	Shady Hills Elementary School WWTF	Shady Hills Elementary School WWTF	Silver	Silver	DW
FLA010704	Shady Rd Villas WWTF	Shady Rd Villas WWTF	Silver	–	DW
FLA010729	Sharpes Ferry MHC WWTF	Sharpes Ferry MHC WWTF	Silver	Silver	DW
FLA010701	Smith Lake Shores WWTF	Smith Lake Shores WWTF	Silver	–	DW
FLA010744	Spanish Oaks MHP WWTF	Spanish Oaks MHP WWTF	Silver	Silver	DW
FLA010740	Spanish Palm Estates WWTF	Spanish Palm Estates WWTF	Silver	Silver	DW
FLA010667	Sparr Elementary School	Sparr Elementary School	Silver	–	DW
FLA010690	Sportsman Cove WWTF	Sportsman Cove WWTF	Silver	–	DW

Facility ID	Facility Name	Managing Entity	BMAP	PFA	Facility Type*
FLA010697	Springlake Villages MHP WWTF	Springlake Villages MHP WWTF	–	–	DW
FLA010700	Springs RV Resort WWTF	Springs RV Resort WWTF	Silver	Silver	DW
FLA016867	Spruce Creek Preserve	Spruce Creek Preserve	–	–	DW
FLA010668	Stanton Weirsdale Elementary School WWTF	Stanton Weirsdale Elementary School WWTF	Silver	–	DW
FLA010790	State Fire College	State Fire College	Silver	–	DW
FLA012705	Sweetwater Oaks MHP WWTF	Sweetwater Oaks MHP WWTF	Rainbow	–	DW
FLA010736	Tall Timber WWTF	Tall Timber WWTF	–	–	DW
FLA010699	Tradewinds WWTF	Tradewinds WWTF	Silver	Silver	DW
FLA010731	Vacation Host Inn	Vacation Host Inn	Silver	Silver	DW
FLA010743	VFW Domiciliary	VFW Domiciliary	–	–	DW
FLA010692	Victory MHP LLC	Victory MHP LLC	Silver	Silver	DW
FLA010756	Wandering Oaks RV Resort WWTF	Wandering Oaks RV Resort WWTF	Silver	Silver	DW
FLA012685	Westwood MHP WWTF	Westwood MHP WWTF	Rainbow	–	DW
FLA010706	Whispering Oaks WWTF	Whispering Oaks WWTF	Silver	–	DW
FLA012677	White Oaks MHP WWTF	White Oaks MHP WWTF	Rainbow	–	DW
FLA107077	Wilderness RV Park Estates, Inc.	Wilderness RV Park Estates, Inc.	Silver	Silver	DW
FLA010702	Young Life Southwind WWTF	Young Life Southwind WWTF	–	–	DW

*Facility Type: CBP =Concrete Bath Plant; DW = Domestic wastewater; IW = Industrial wastewater; RAF = Residuals Application Facility; RES = Residuals.

Note: – = N/A.

Appendix B

Non-Residential Wastewater Flow Assumptions

Appendix B

Non-Residential Wastewater Flow Assumptions

DOR UC	Description	Data	Flow Rate	Conversion Factor
10	Vacant Commercial – with/without extra features	Assumed no wastewater flow.		
11	Stores, one story	TOT_LVG_AR	200 per bathroom	2 bathrooms/ 1,500 square feet (SF)
12	Mixed use – store and office or store and residential combination	TOT_LVG_AR	200 per bathroom	2 bathrooms/ 1,500 SF
13	Department Stores	TOT_LVG_AR	200 per bathroom	2 bathrooms/ 1,500 SF
14	Supermarkets	TOT_LVG_AR	15 gallons per 100 SF	N/A
15	Regional Shopping Centers	TOT_LVG_AR	15 gallons per 100 SF	N/A
16	Community Shopping Centers	TOT_LVG_AR	0.1 gallon per SF	N/A
17	Office buildings, non-professional service buildings, one story	TOT_LVG_AR	15 gallons per 100 SF	N/A
18	Office buildings, non-professional service buildings, multi-story	TOT_LVG_AR	15 gallons per 100 SF	N/A
19	Professional service buildings	TOT_LVG_AR	15 gallons per 100 SF	N/A
21	Restaurants, cafeterias	TOT_LVG_AR	40 to 60 gallons per seat	11 to 15 SF/seat
22	Drive-in Restaurants	TOT_LVG_AR	40 to 60 gallons per seat	11 to 15 SF/seat
23	Financial institutions (banks, saving and loan companies, mortgage companies, credit services)	TOT_LVG_AR	15 gallons per 100 SF	N/A
24	Insurance Acompany offices	TOT_LVG_AR	15 gallons per 100 SF	
25	Repair service shops (excluding automotive), radio and TV repair, refrigeration service, electric repair, laundries, Laundromats	TOT_LVG_AR	10 gallons per 100 SF	N/A

DOR UC	Description	Data	Flow Rate	Conversion Factor
26	Service stations	TOT_LVG_AR	200 per bathroom	2 bathrooms/ 1,500 SF
27	Auto sales, auto repair and storage, auto service shops, body and fender shops, commercial garages, farm and machinery sales and services, auto rental, marine equipment, trailers and related equipment, mobile home sales, motorcycles, construction vehicle sales	TOT_LVG_AR	10 gallons per 100 SF	N/A
28	Parking lots (commercial or patron), mobile home parks	TOT_LVG_AR	10 gallons per 100 SF	N/A
29	Wholesale outlets, produce houses, manufacturing outlets	TOT_LVG_AR	10 gallons per 100 SF	N/A
30	Florists, greenhouses	TOT_LVG_AR	15 gallons per 100 SF	N/A
31	Drive-in theaters, open stadiums	TOT_LVG_AR	4 gallons per seat	1 seat/10 SF
32	Enclosed theaters, enclosed auditoriums	TOT_LVG_AR	4 gallons per seat	1 seat/10 SF
33	Nightclubs, cocktail lounges, bars	TOT_LVG_AR	4 gallons per seat	1 seat/10 SF
34	Bowling alleys, skating rinks, pool halls, enclosed arenas	TOT_LVG_AR	5 gallons per 100 SF	N/A
35	Tourist attractions, permanent exhibits, other entertainment facilities, fairgrounds (privately owned)	TOT_LVG_AR	10 gallons per 100 SF	N/A
36	Camps	TOT_LVG_AR	100 gallons per cabin	1 room/500 SF
37	Racetracks (horse, auto, or dog)	TOT_LVG_AR	2 gallons per seat	1 seat/10 SF
38	Golf courses, driving ranges	TOT_LVG_AR	5 gallons per 100 SF	N/A
39	Hotels, motels	TOT_LVG_AR	100 gallons per room	1 room/500 SF
40	Vacant Industrial – with/without extra features	Assumed no wastewater flow.		
41	Light manufacturing, small equipment manufacturing plants, small machine shops, instrument manufacturing, printing plants	TOT_LVG_AR	5 gallons per 100 SF	N/A

DOR UC	Description	Data	Flow Rate	Conversion Factor
42	Heavy industrial, heavy equipment manufacturing, large machine shops, foundries, steel fabricating plants, auto or aircraft plants	TOT_LVG_AR	5 gallons per 100 SF	N/A
43	Lumber yards, sawmills, planing mills	TOT_LVG_AR	5 gallons per 100 SF	N/A
44	Packing plants, fruit and vegetable packing plants, meat packing plants	TOT_LVG_AR	15 gallons per 100 SF	N/A
45	Canneries, fruit and vegetable, bottlers and brewers, distilleries, wineries	TOT_LVG_AR	15 gallons per 100 SF	N/A
46	Other food processing, candy factories, bakeries, potato chip factories	TOT_LVG_AR	15 gallons per 100 SF	N/A
47	Mineral processing, phosphate processing, cement plants, refineries, clay plants, rock and gravel plants	TOT_LVG_AR	10 gallons per 100 SF	N/A
48	Warehousing, distribution terminals, trucking terminals, van and storage warehousing	TOT_LVG_AR	10 gallons per 100 SF	N/A
49	Open storage, new and used building supplies, junk yards, auto wrecking, fuel storage, equipment and material storage	TOT_LVG_AR	5 gallons per 100 SF	N/A
50-66	Agricultural	Assumed no wastewater flow.		
67	Poultry, bees, tropical fish, rabbits, etc.	TOT_LVG_AR	15 gallons per 100 SF	N/A
68	Dairies, feed lots	TOT_LVG_AR	15 gallons per 100 SF	N/A
69	Ornamentals, miscellaneous agricultural	Assumed no wastewater flow.		
70	Vacant Institutional, with or without extra features	Assumed no wastewater flow.		
71	Churches	TOT_LVG_AR	4 gallons per seat	1 seat/10 SF
72	Private schools and colleges	TOT_LVG_AR	10 gallons per student	1 student/30 SF
73	Privately owned hospitals	TOT_LVG_AR	200 per hospital bed	100-200 SF/patient
74	Homes for the aged	TOT_LVG_AR	100 per hospital bed	225 SF/hospital bed
75	Orphanages, other non-profit or charitable services	No available data.		

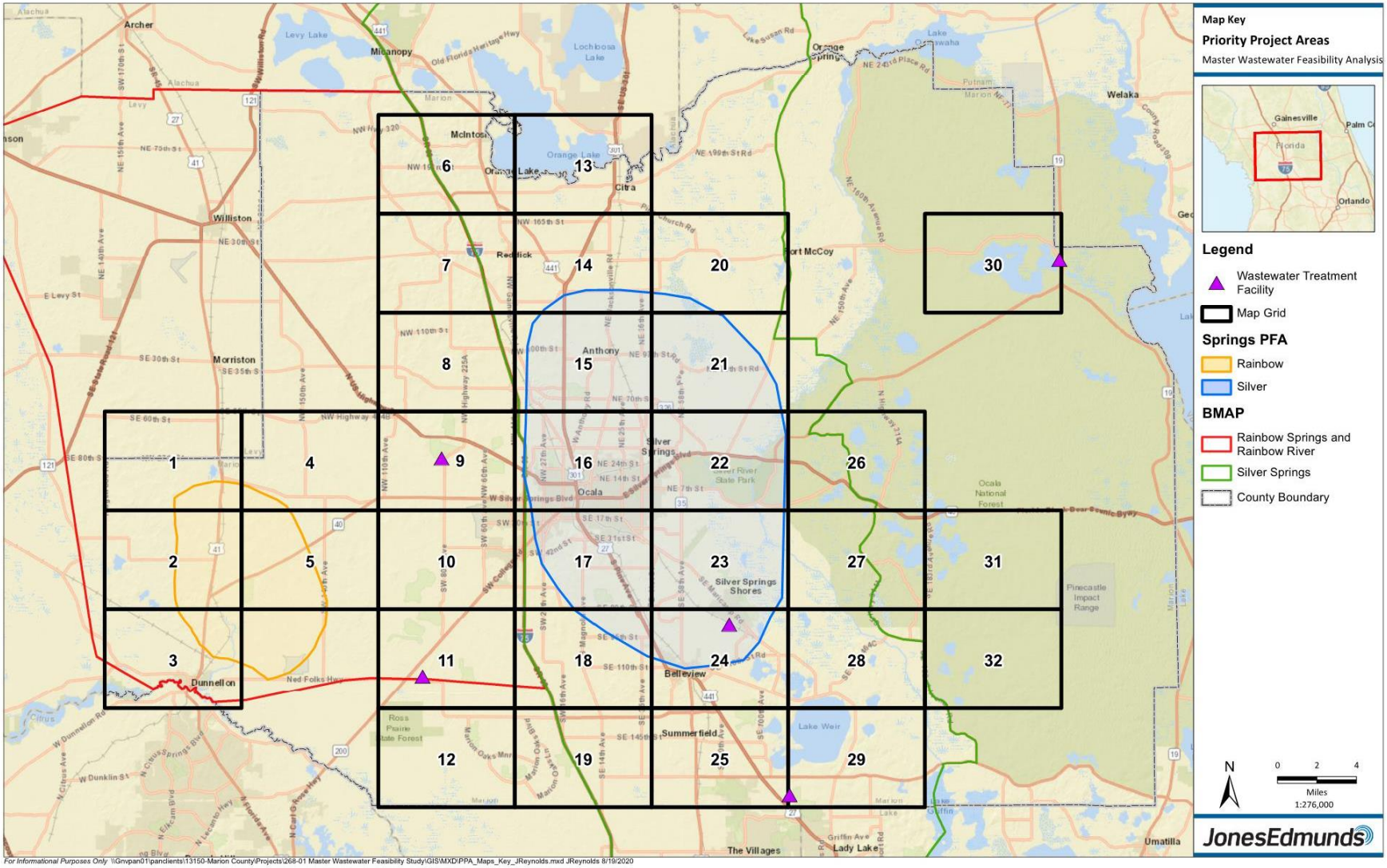
DOR UC	Description	Data	Flow Rate	Conversion Factor
76	Mortuaries, cemeteries, crematoriums	TOT_LVG_AR	5 gallons per 100 SF	N/A
77	Clubs, lodges, union halls	TOT_LVG_AR	5 gallons per 100 SF	N/A
78	Sanitariums, convalescent and rest homes	TOT_LVG_AR	200 per hospital bed	100-200 SF/patient
79	Cultural organizations, facilities	TOT_LVG_AR	5 gallons per 100 SF	N/A
80	Vacant Governmental – with/without extra features for municipal, counties, state, federal properties, and water management district (including DOT/State of Florida retention and/or detention areas)	Assumed no wastewater flow.		
81	Military	TOT_LVG_AR	5 gallons per 100 SF	N/A
82	Forest, parks, recreational areas	TOT_LVG_AR	5 gallons per 100 SF	N/A
83	Public county schools – including all property of Board of Public Instruction	TOT_LVG_AR	10 gallons per student	1 student/30 SF
84	Colleges (non-private)	TOT_LVG_AR	10 gallons per student	1 student/30 SF
85	Hospitals (non-private)	TOT_LVG_AR	200 per hospital bed	100-200 SF/patient
86	Counties (other than public schools, colleges, hospitals) including non-municipal government	TOT_LVG_AR	5 gallons per 100 SF	N/A
87	State, other than military, forests, parks, recreational areas, colleges, hospitals	TOT_LVG_AR	5 gallons per 100 SF	N/A
88	Federal, other than military, forests, parks, recreational areas, hospitals, colleges	TOT_LVG_AR	5 gallons per 100 SF	N/A
89	Municipal, other than parks, recreational areas, colleges, hospitals	TOT_LVG_AR	5 gallons per 100 SF	N/A
90	Leasehold interests (government-owned property leased by a non-governmental lessee)	Assumed no wastewater flow.		

DOR UC	Description	Data	Flow Rate	Conversion Factor
91	Utility, gas and electricity, telephone and telegraph, locally assessed railroads, water and sewer service, pipelines, canals, radio/television communications	Assumed no wastewater flow.		
92	Mining lands, petroleum lands, or gas lands	Assumed no wastewater flow.		
93	Subsurface rights	Assumed no wastewater flow.		
94	Right-of-way, streets, roads, irrigation channel, ditch, etc.	Assumed no wastewater flow.		
95	Rivers and lakes, submerged lands	Assumed no wastewater flow.		
96	Sewage disposal, solid waste, borrow pits, drainage reservoirs, waste land, marsh, sand dunes, swamps	Assumed no wastewater flow.		
97	Outdoor recreational or parkland, or high-water recharge subject to classified use assessment	Assumed no wastewater flow.		
98	Centrally assessed	Assumed no wastewater flow.		
99	Acreage not zoned agricultural - with/without extra features	Assumed no wastewater flow.		

Notes: DOR UC = Department of Revenue Land Use Code

Appendix C

PPA Maps



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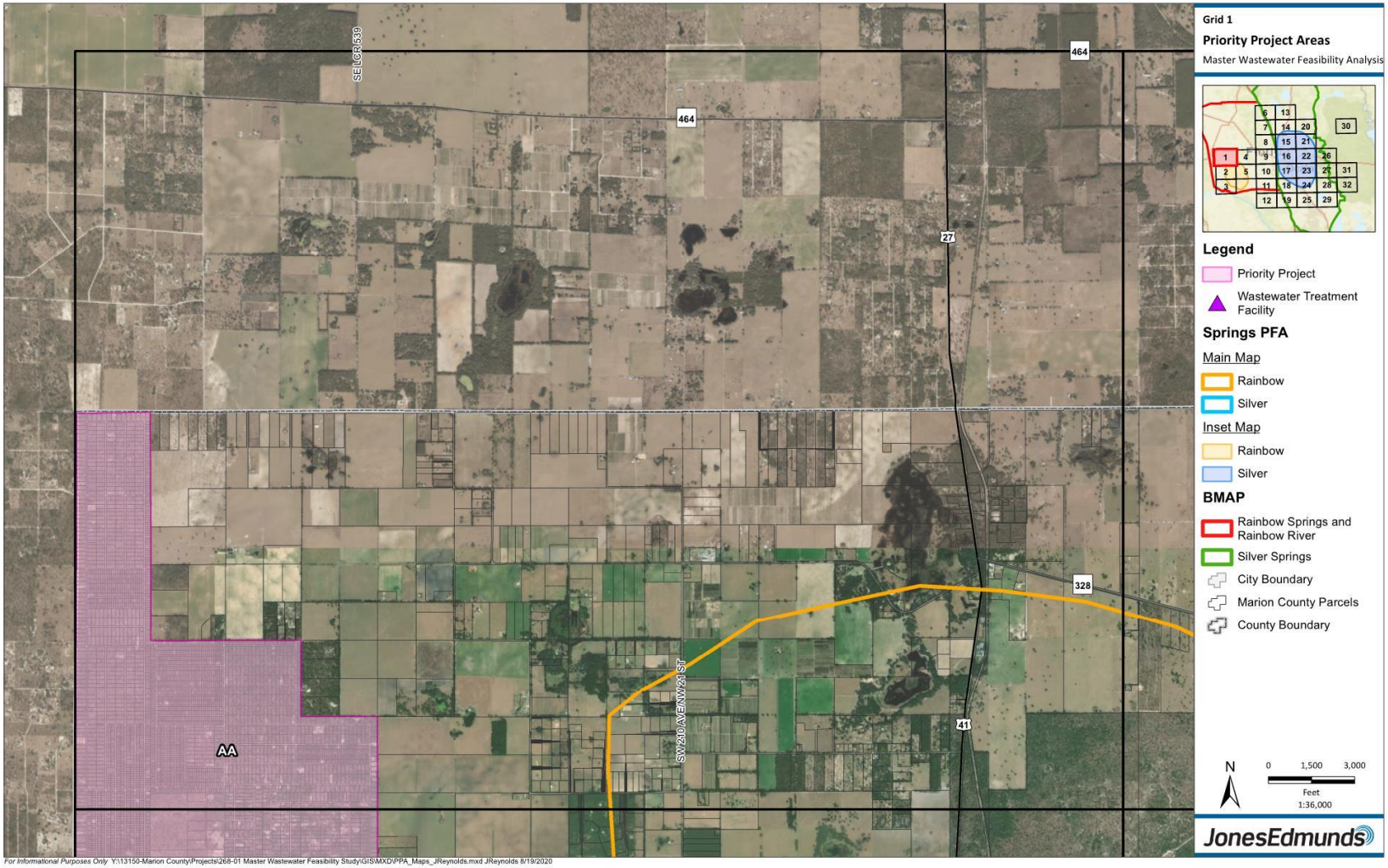

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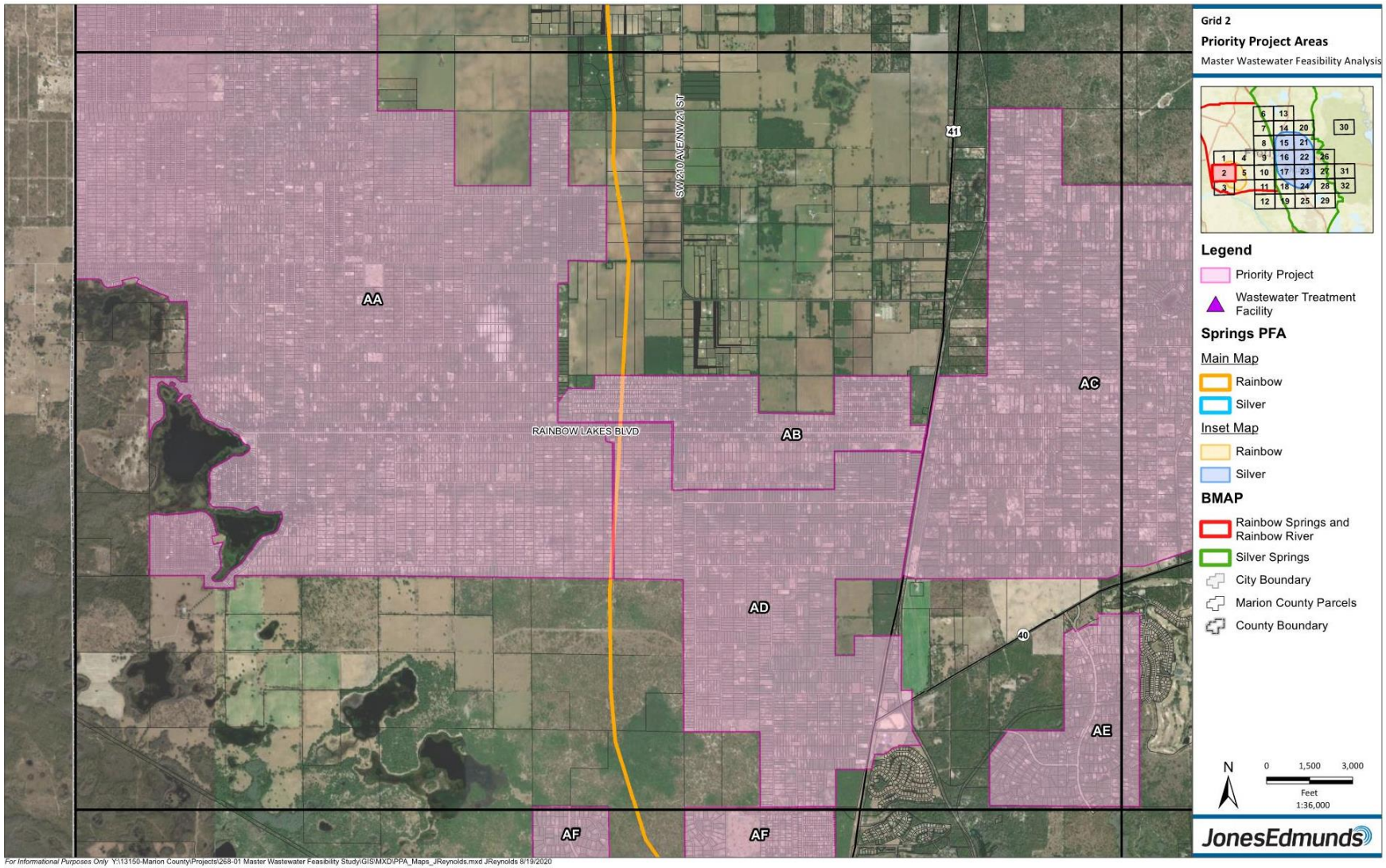

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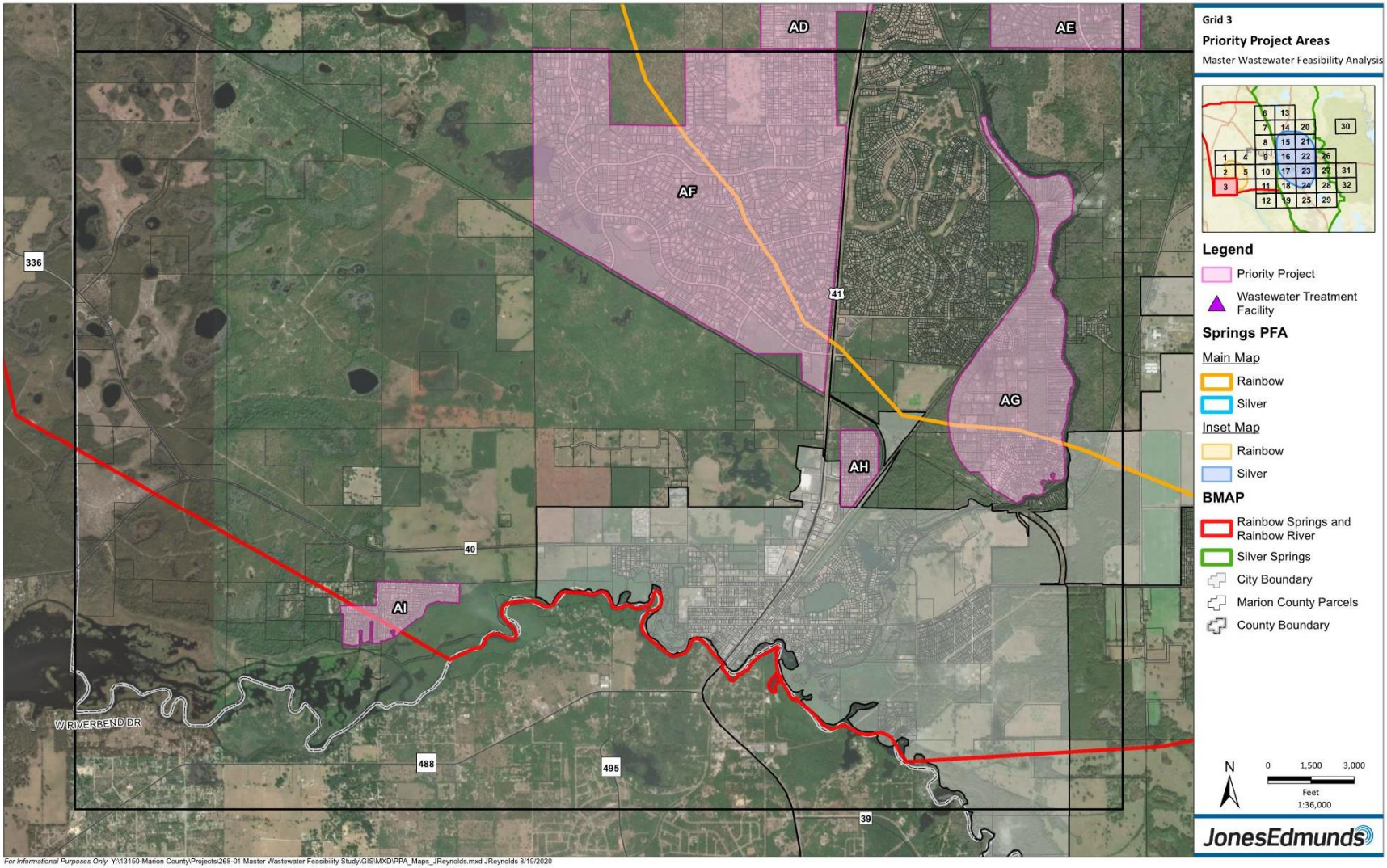

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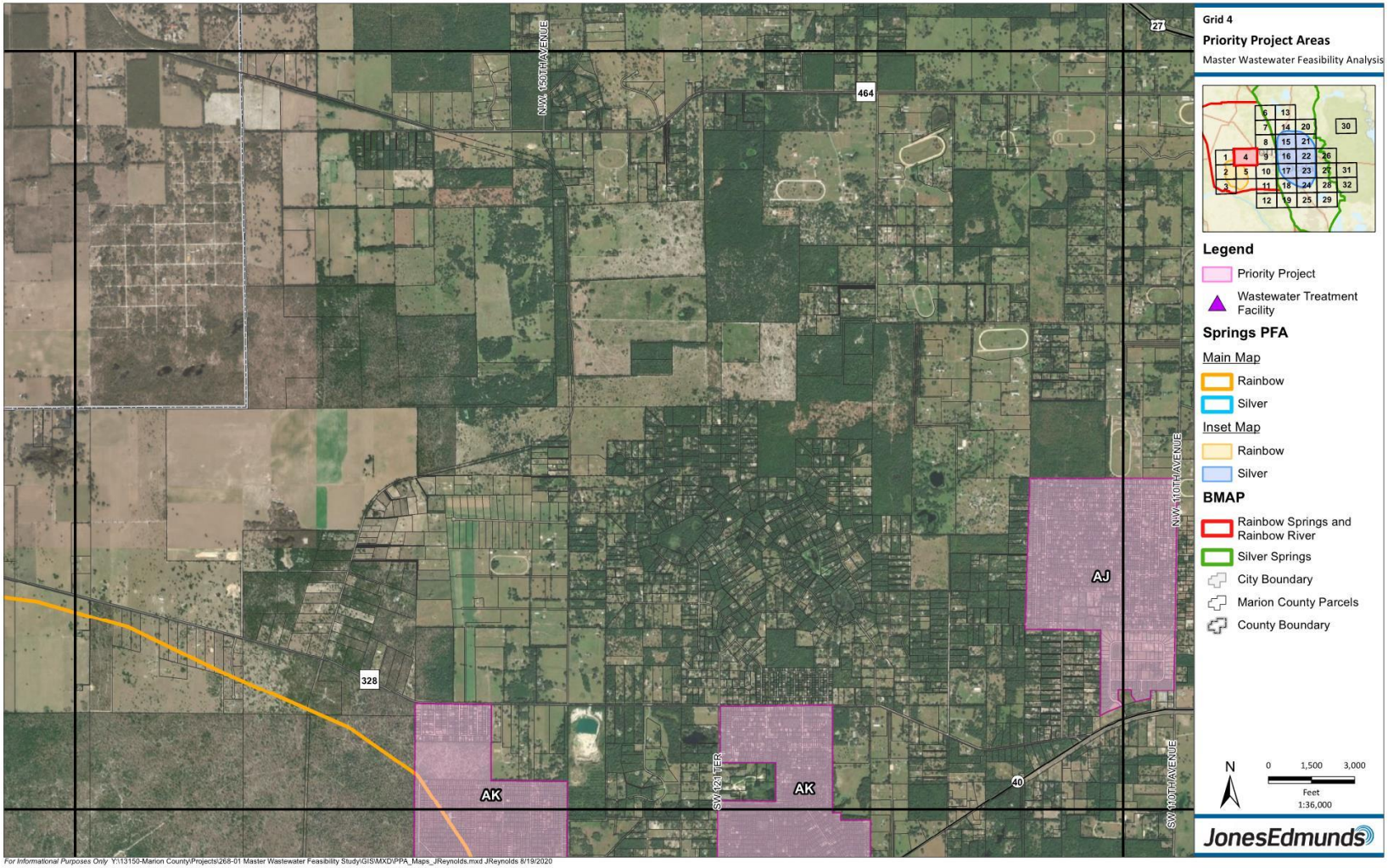

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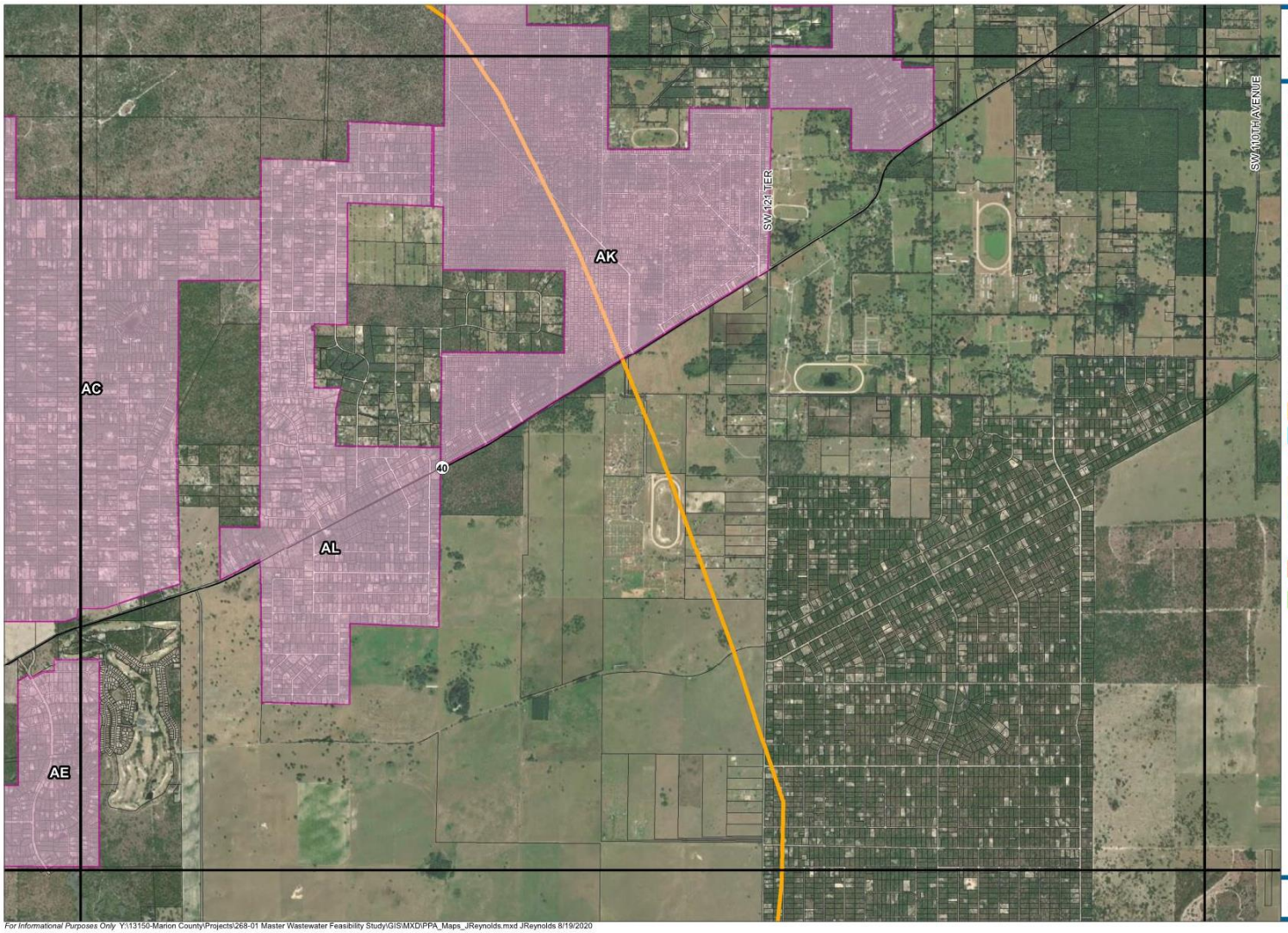
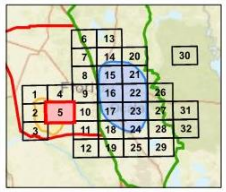


Grid 5

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

0 1,500 3,000

Feet

1:36,000

JonesEdmunds

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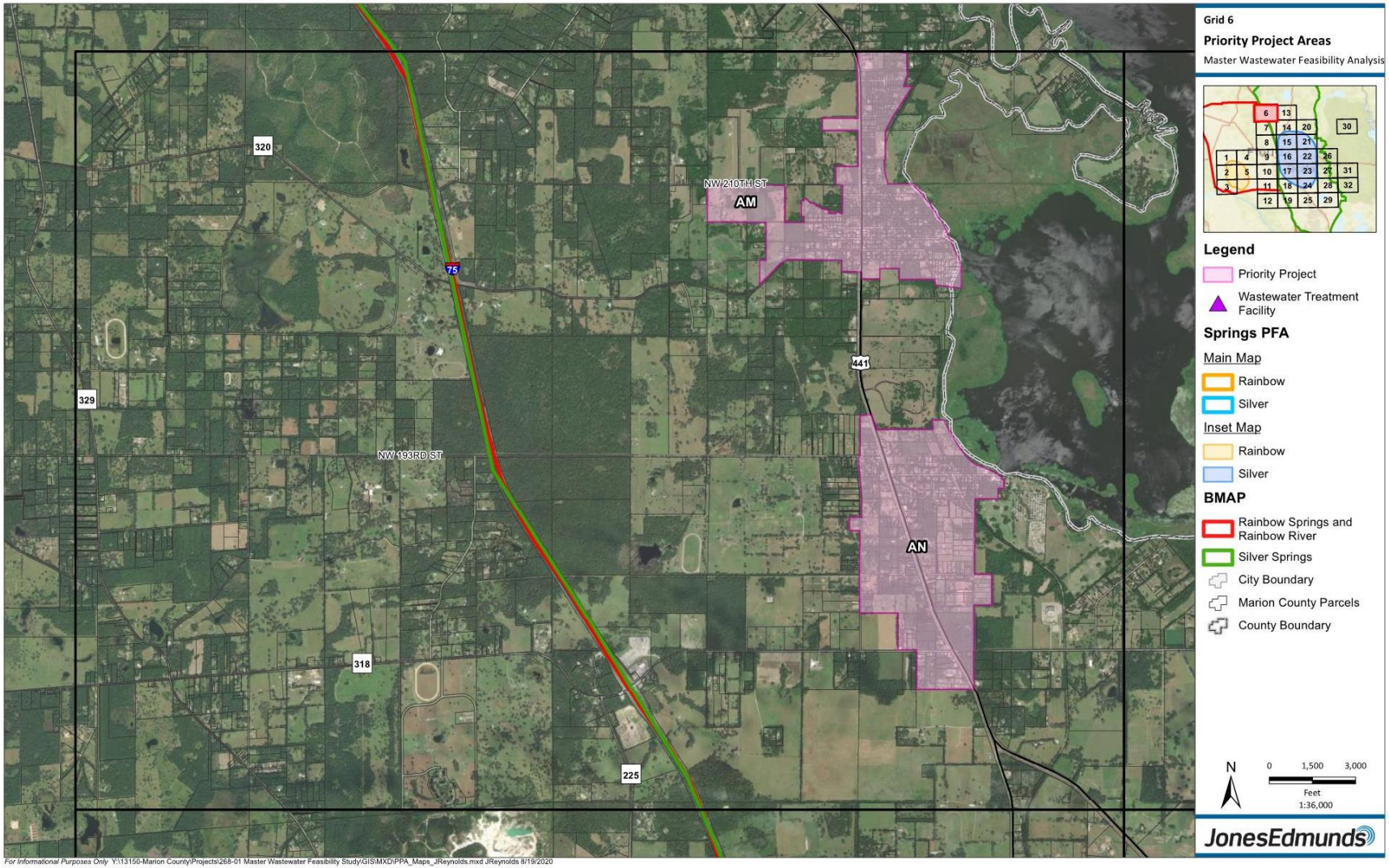

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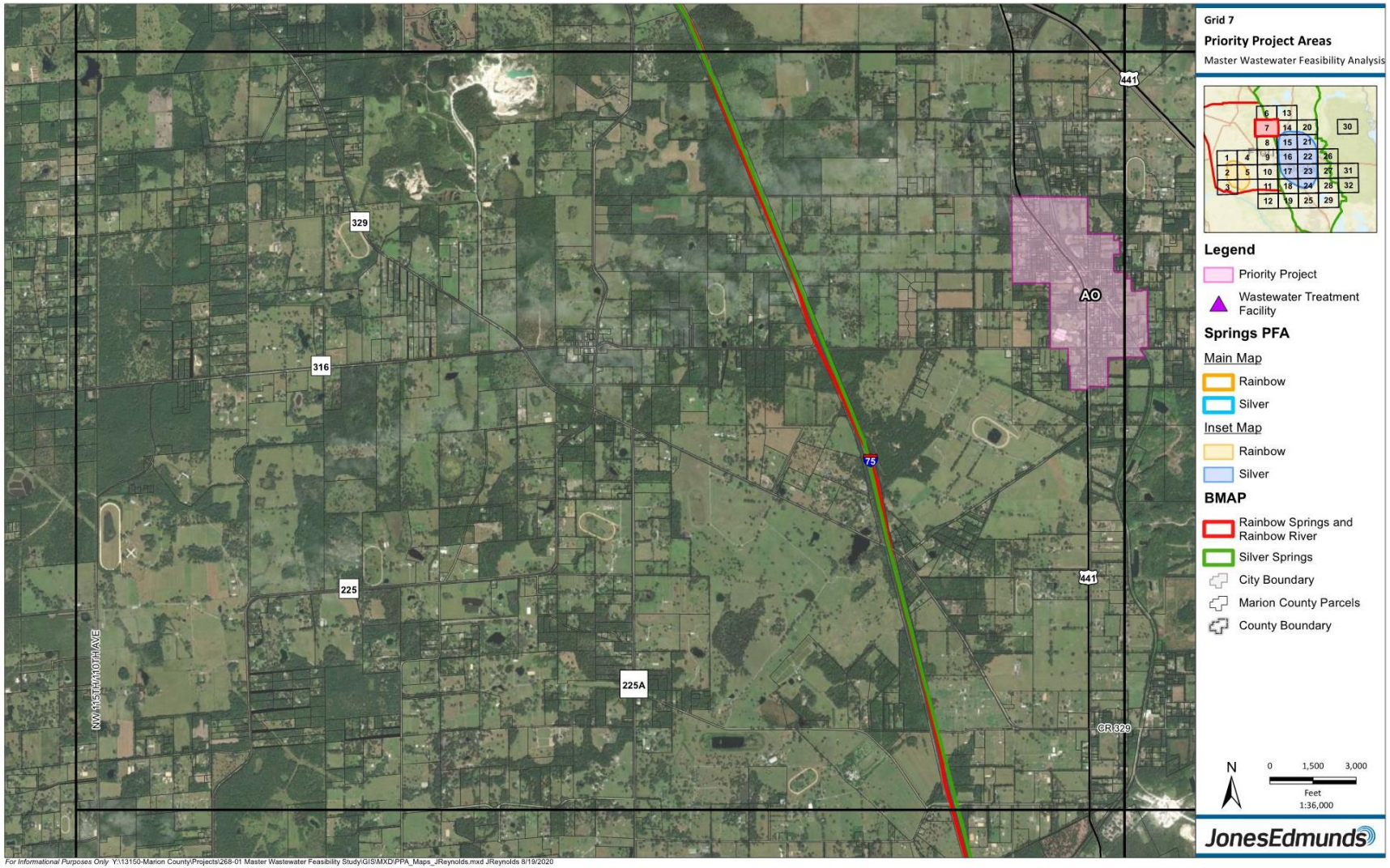

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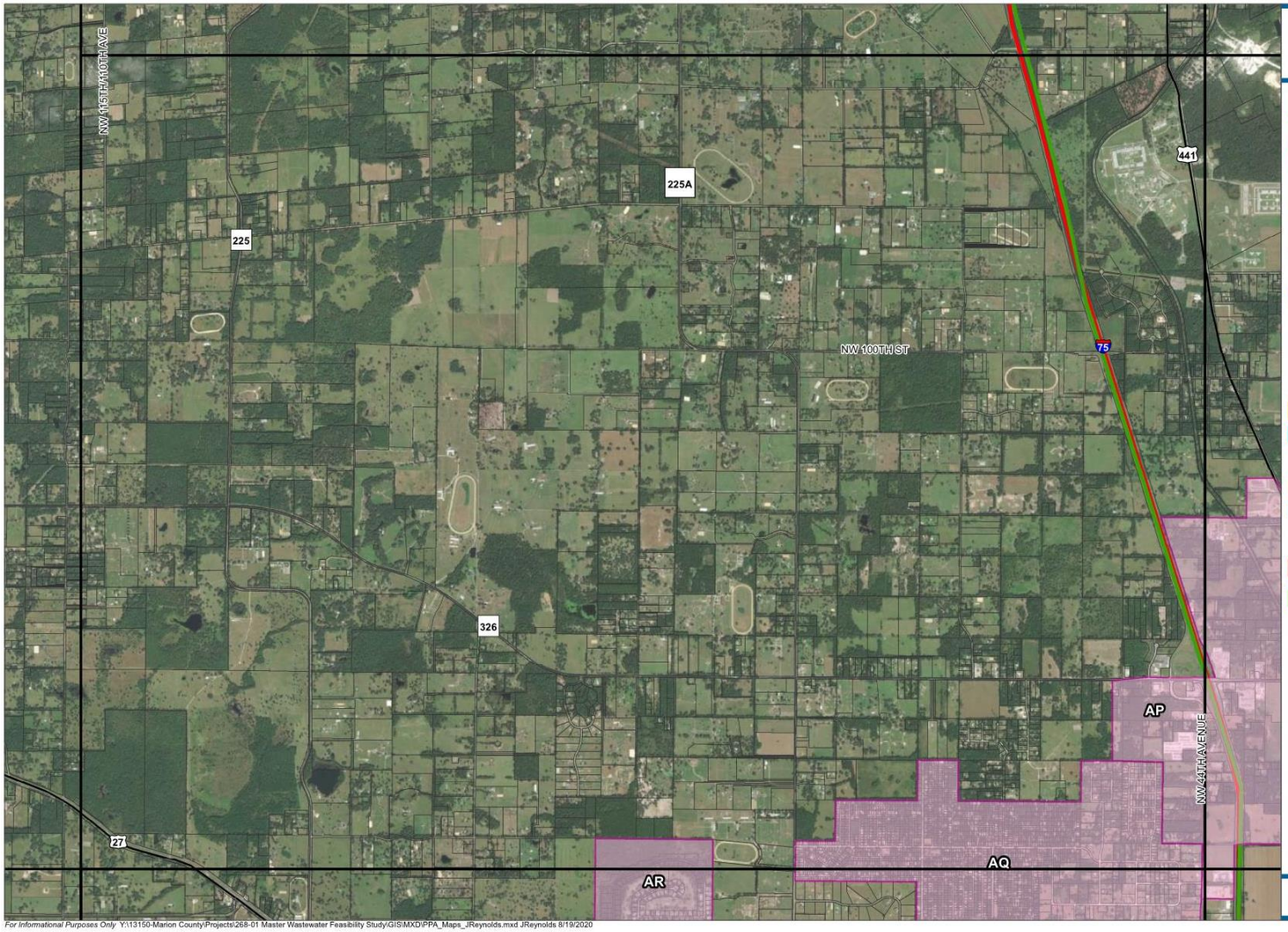
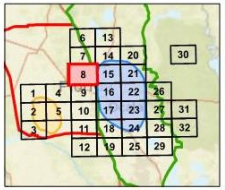


Grid 8

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

0 1,500 3,000

Feet

1:36,000

JonesEdmunds

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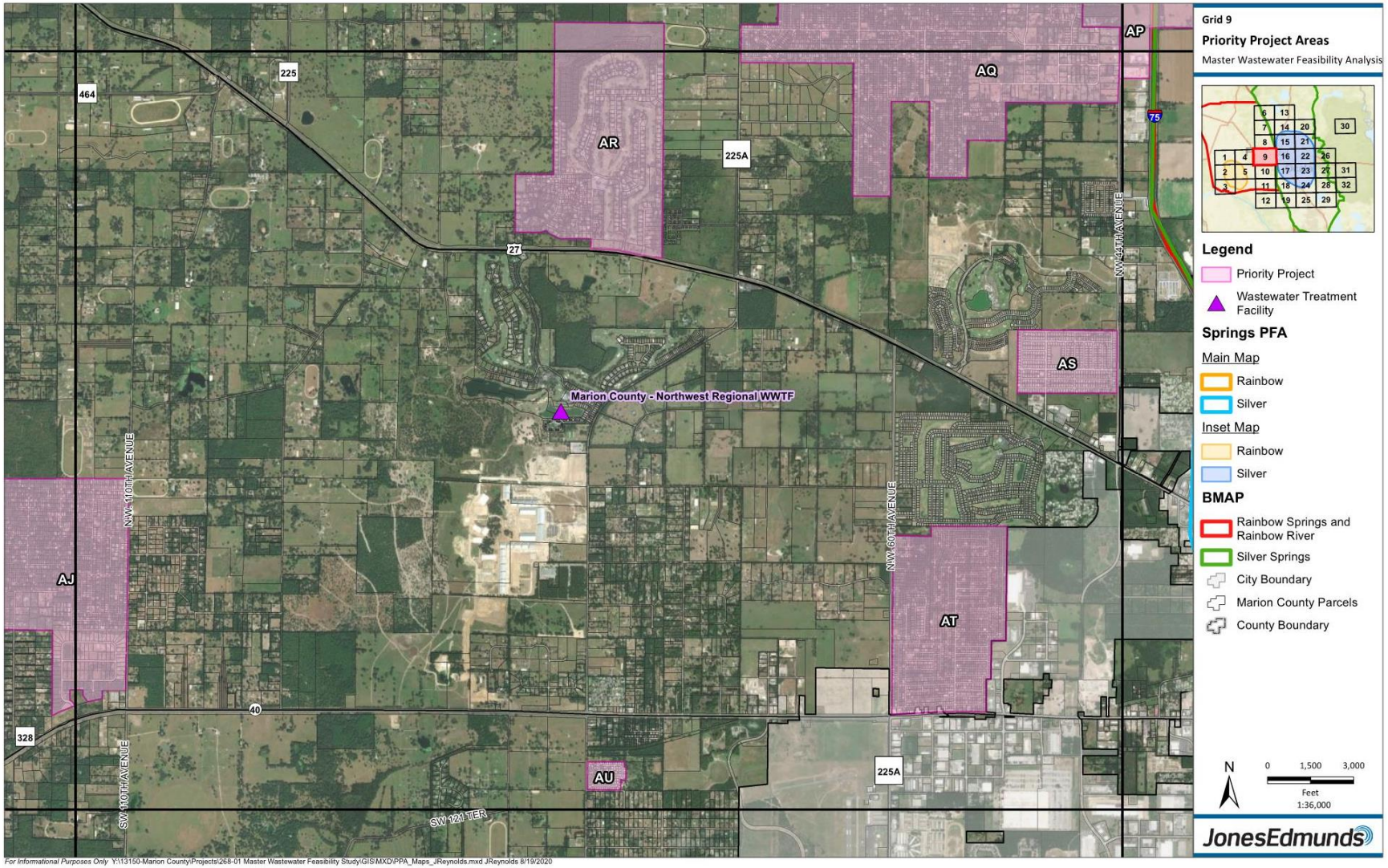

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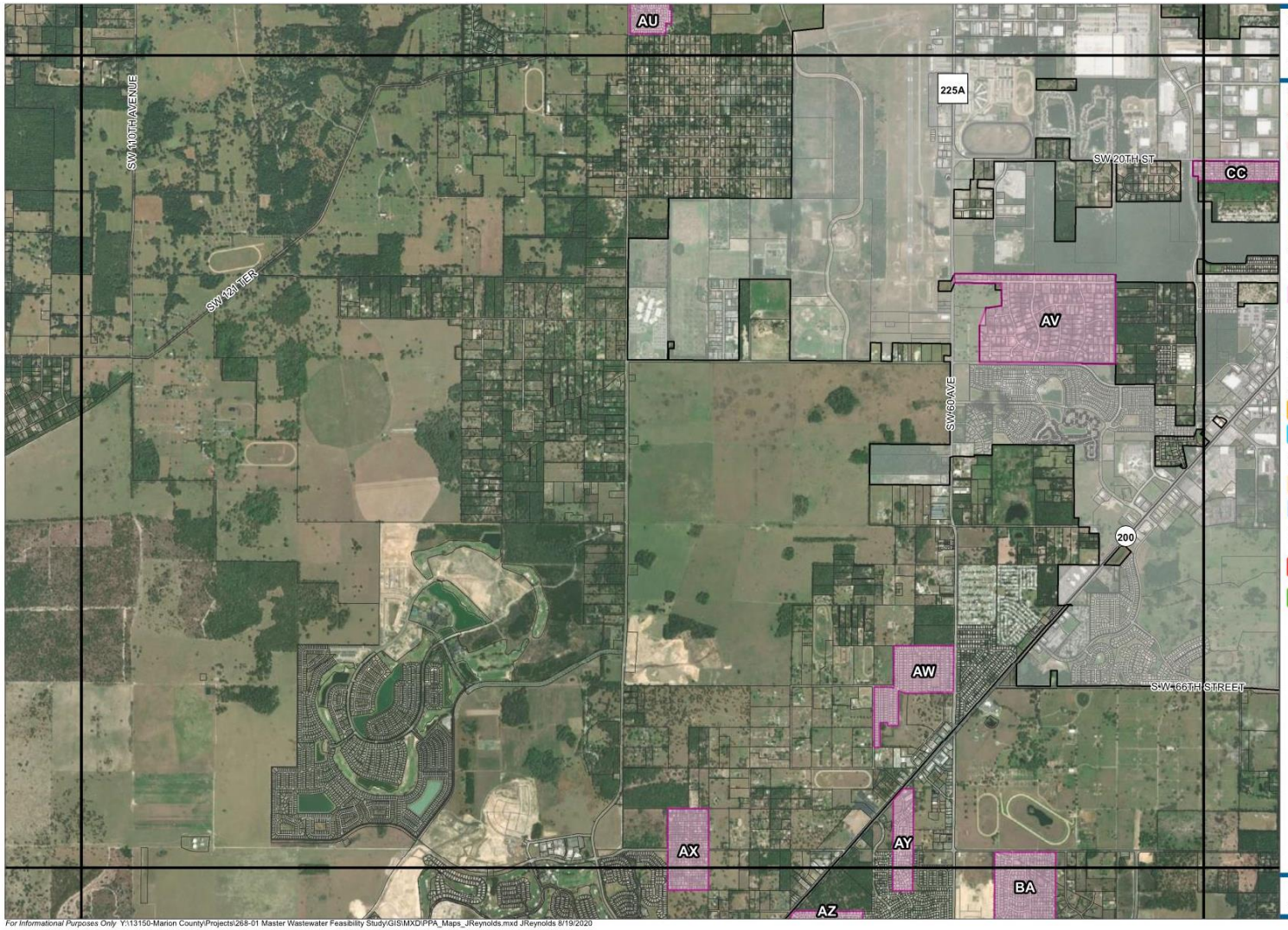
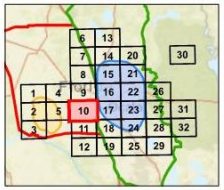


Grid 10

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

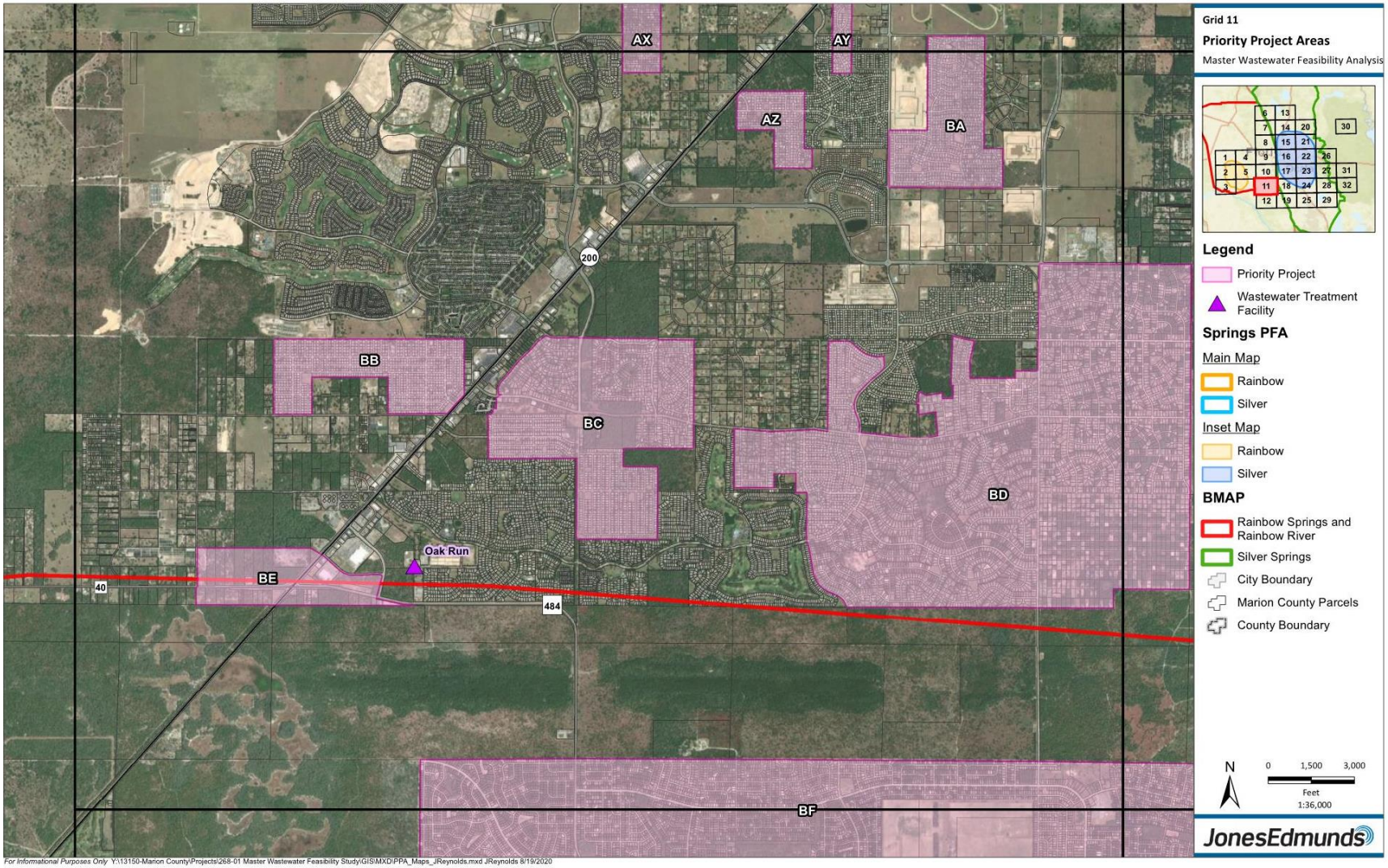
0 1,500 3,000

Feet

1:36,000

JonesEdmunds

For Informational Purposes Only Y:\13150-Marion County\Projects\268-01 Master Wastewater Feasibility Study\GIS\MXD\PPA_Maps_JReynolds.mxd JReynolds 8/19/2020



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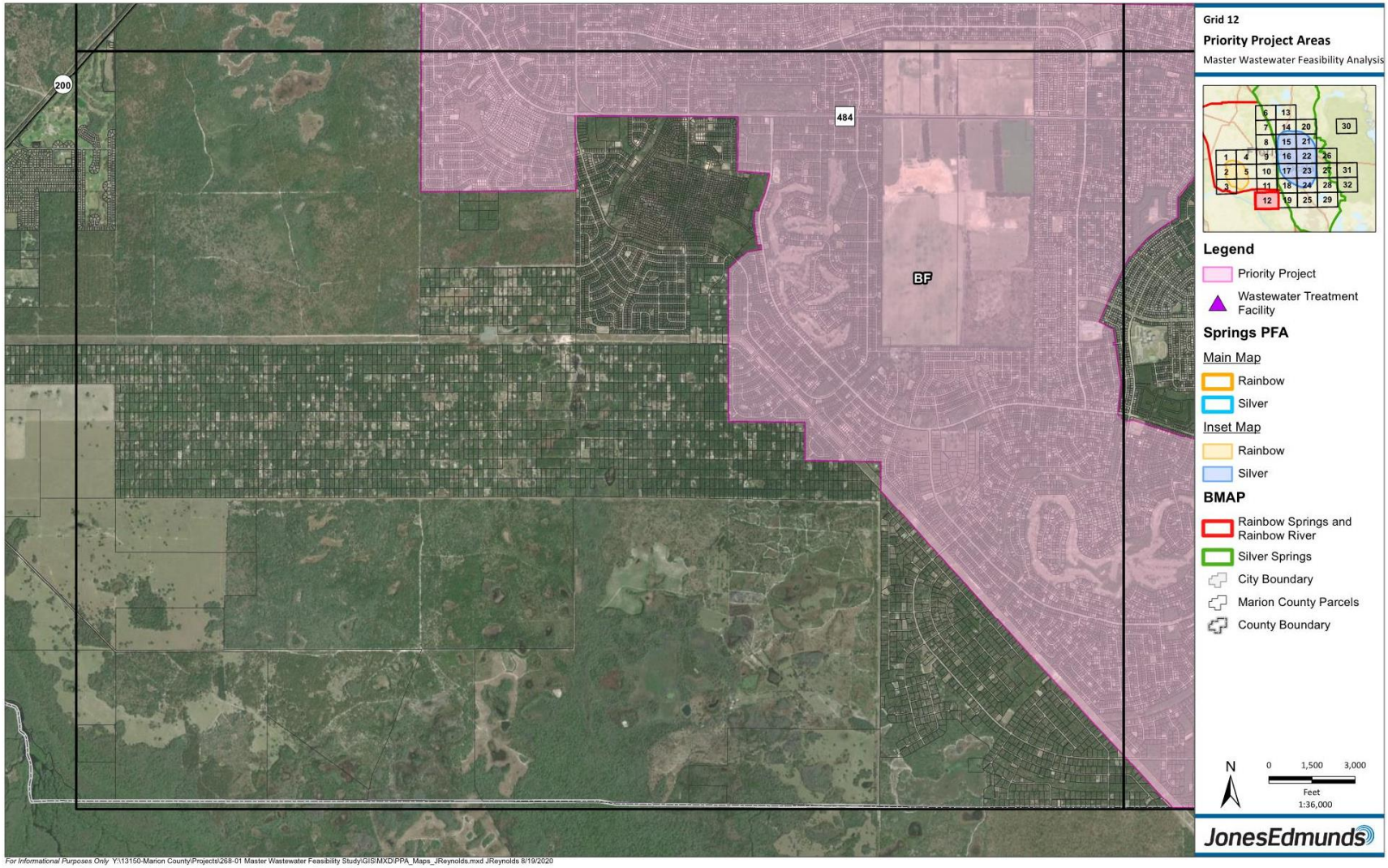

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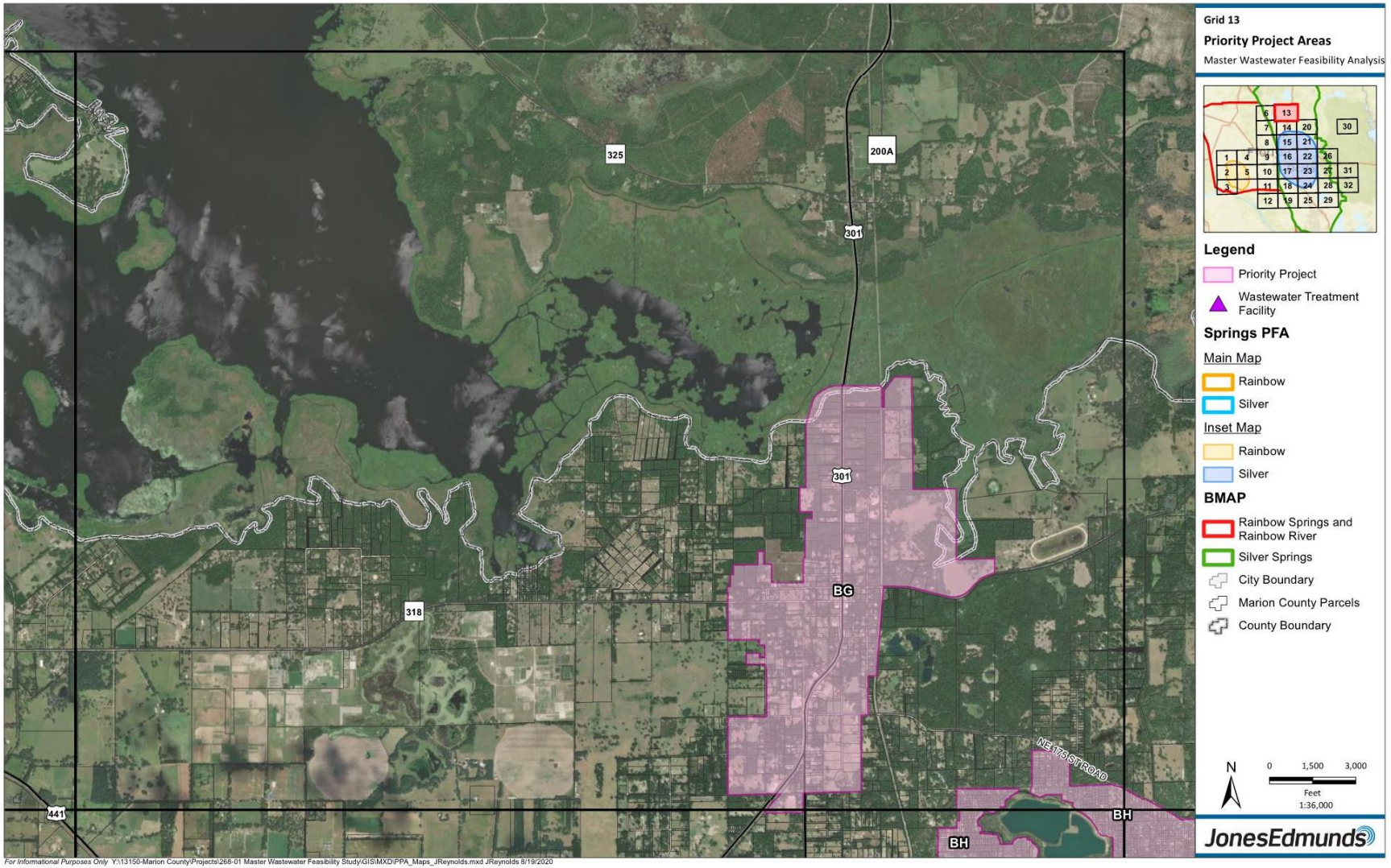

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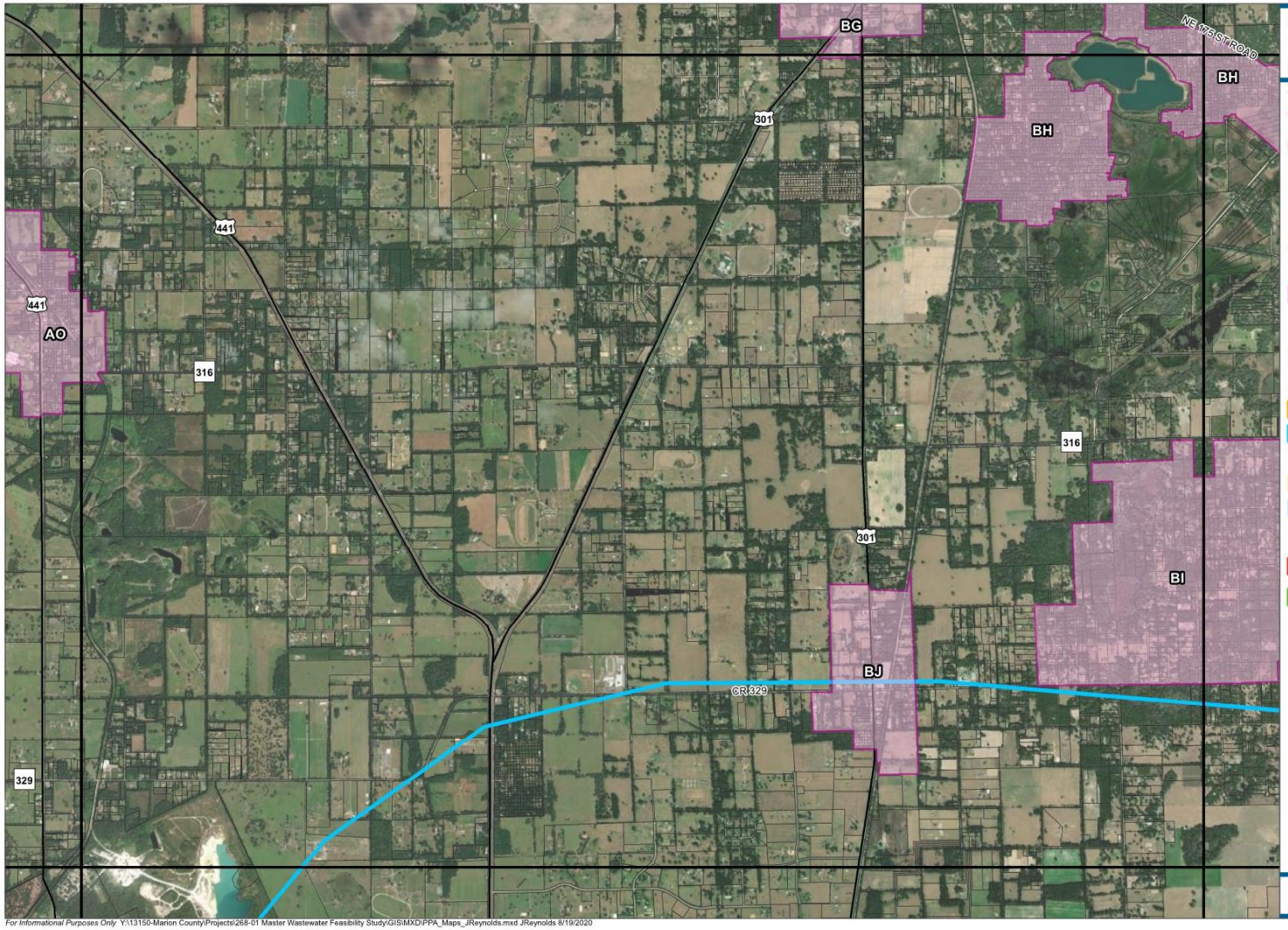
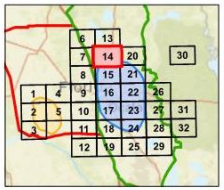


Grid 14

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

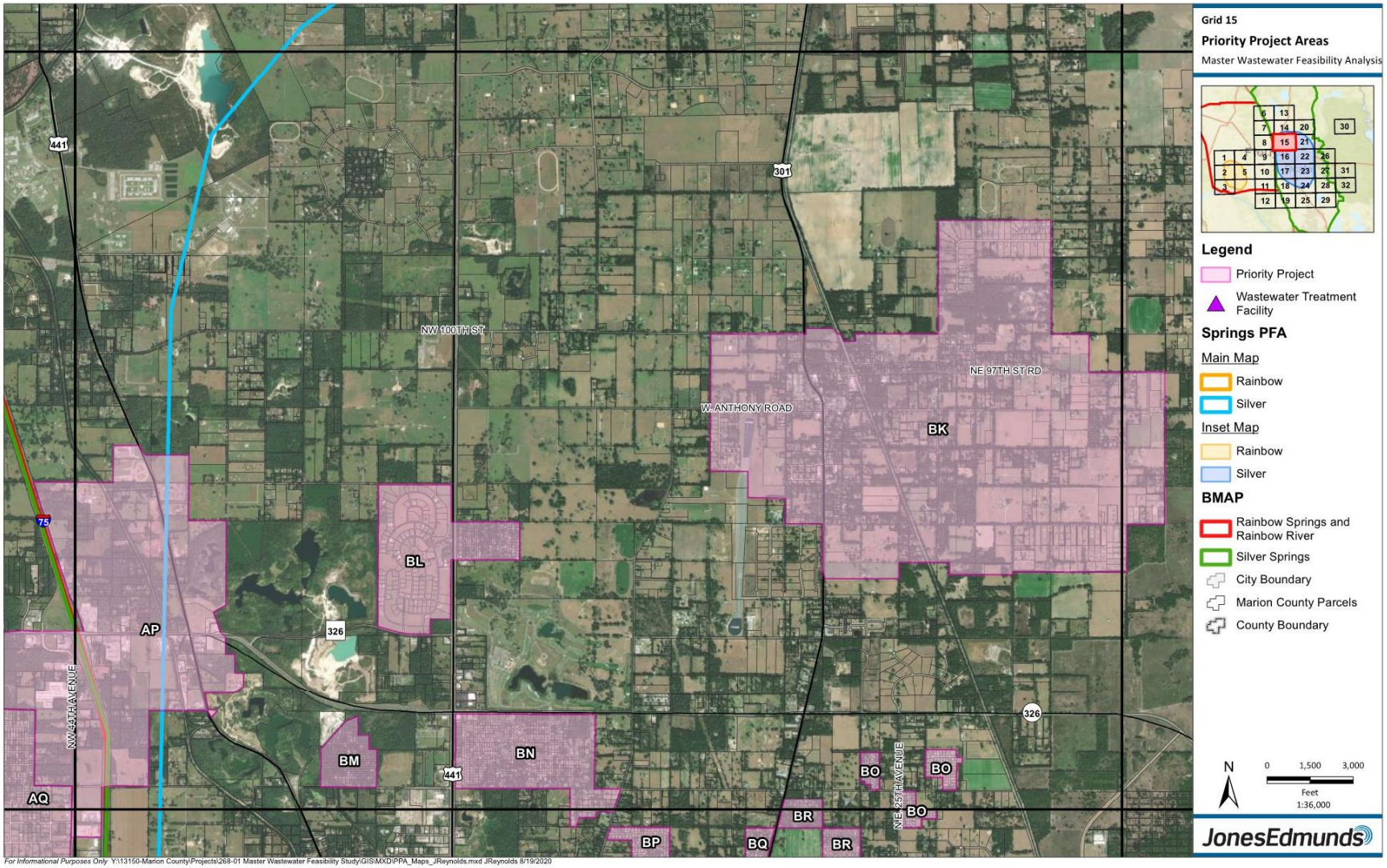
0 1,500 3,000

Feet

1:36,000

JonesEdmunds

For Informational Purposes Only Y:\13150-Marion County\Projects\268-01 Master Wastewater Feasibility Study\GIS\MXD\PPA_Maps_JReynolds.mxd JReynolds 8/19/2020



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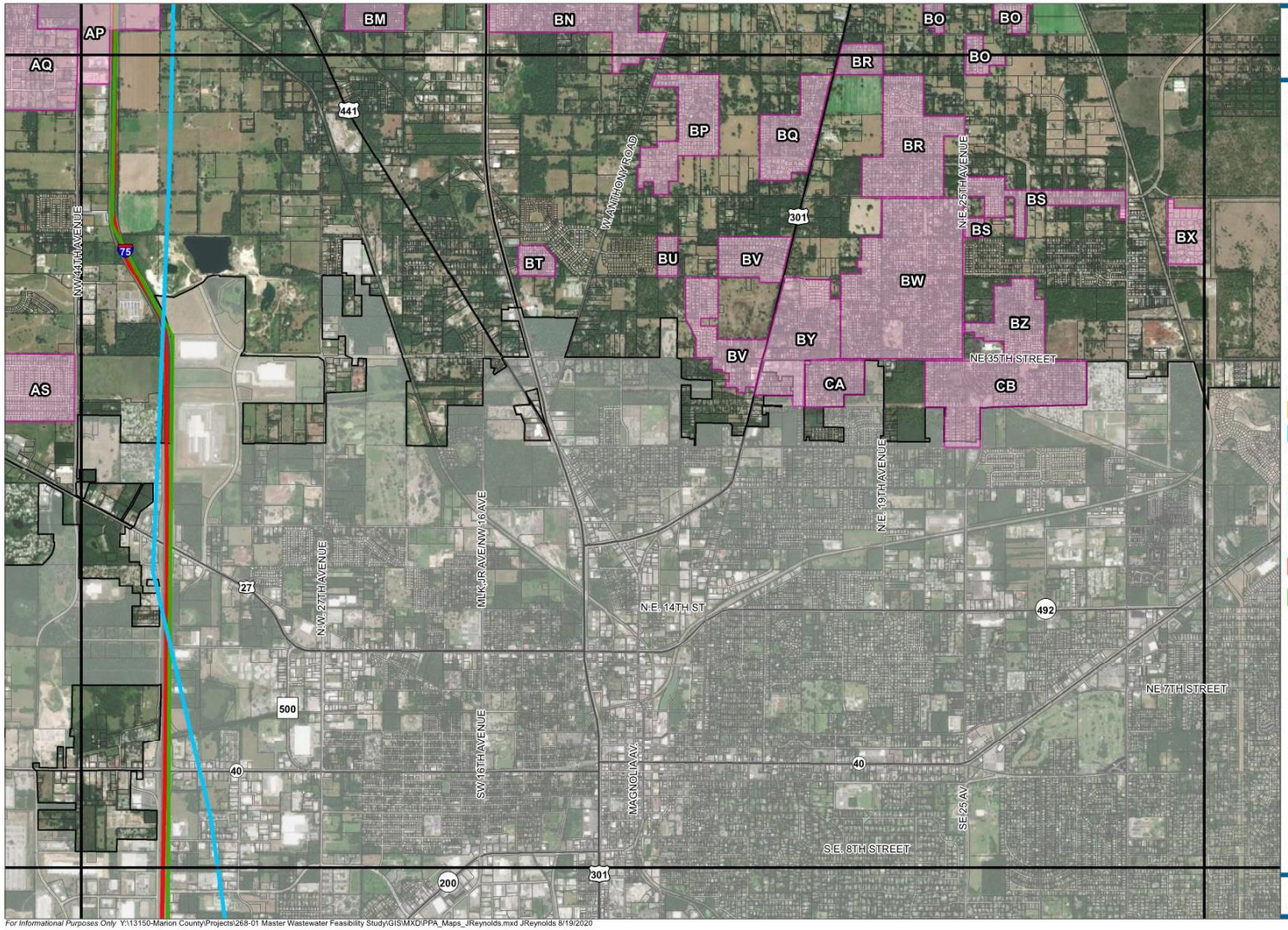
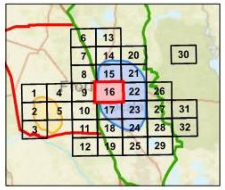


Grid 16

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

0 1,500 3,000

Feet

1:36,000

JonesEdmunds

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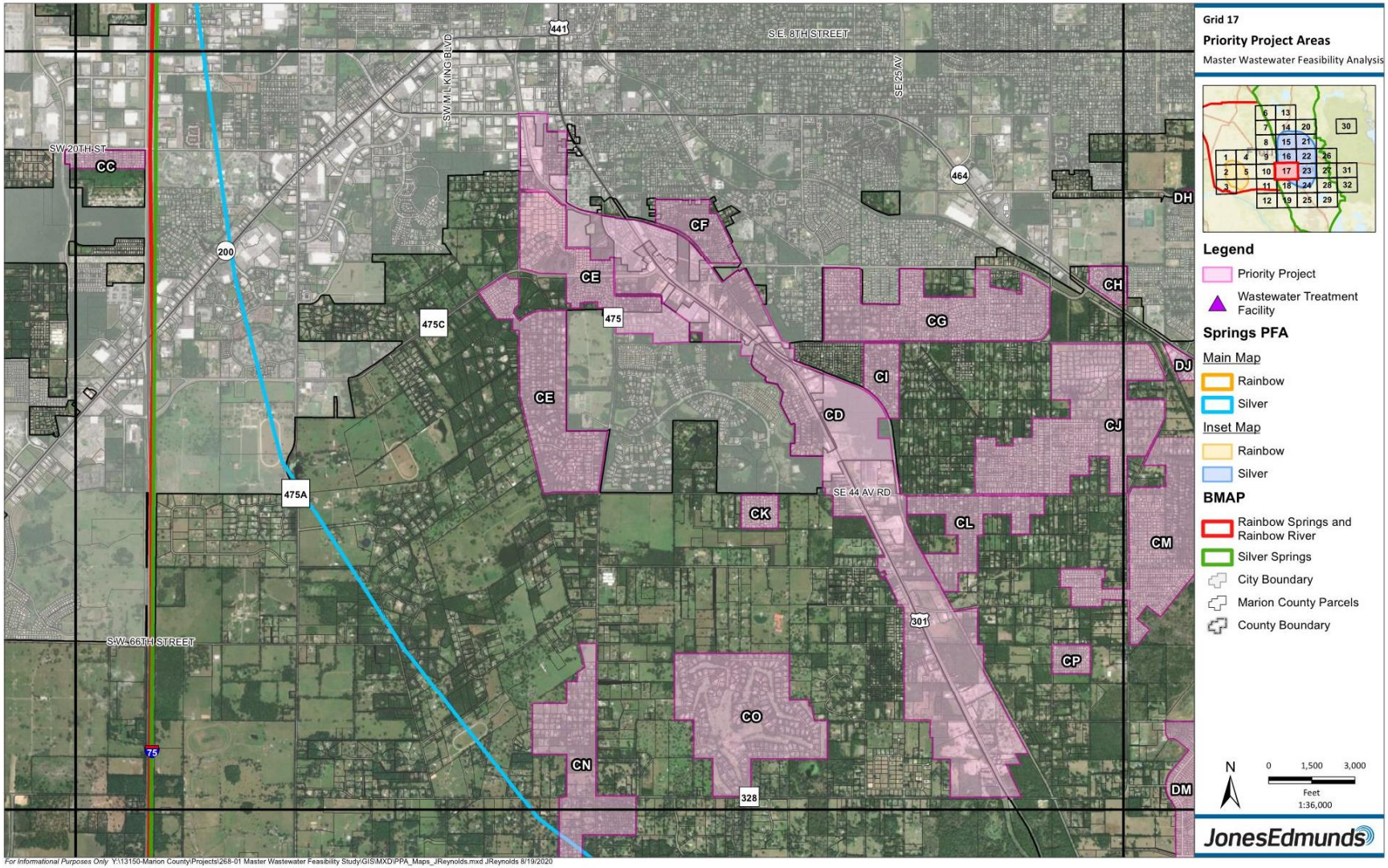

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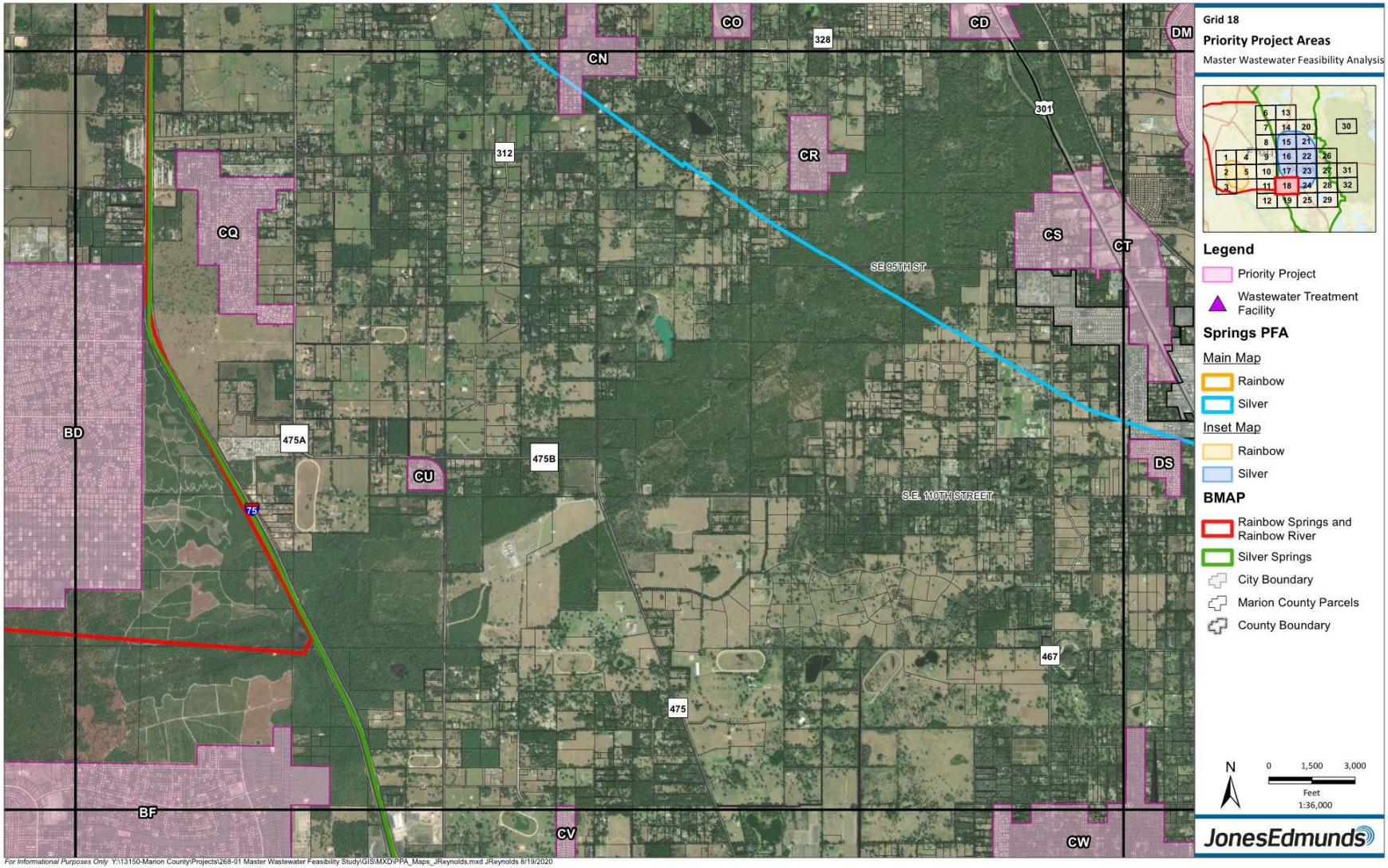

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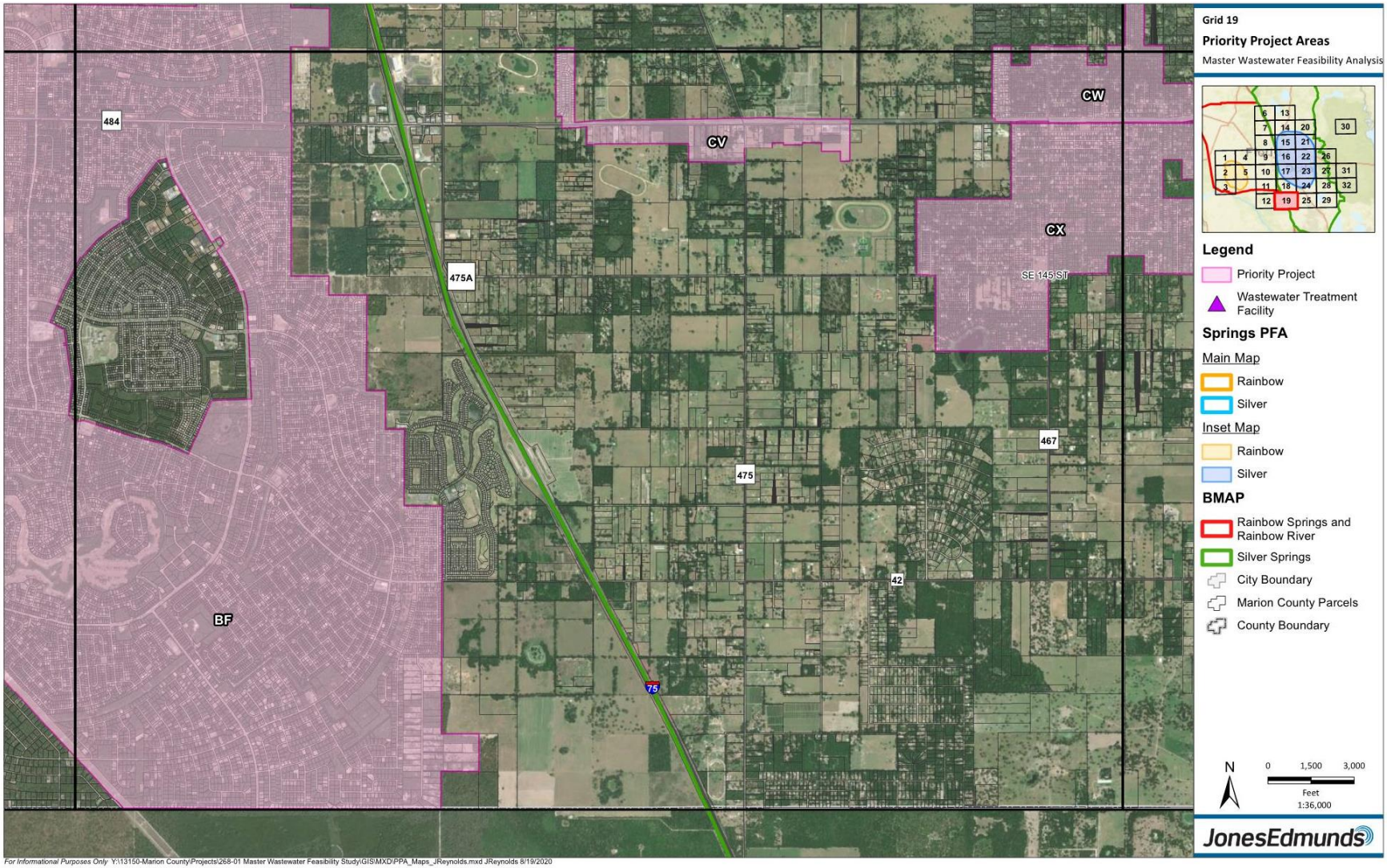

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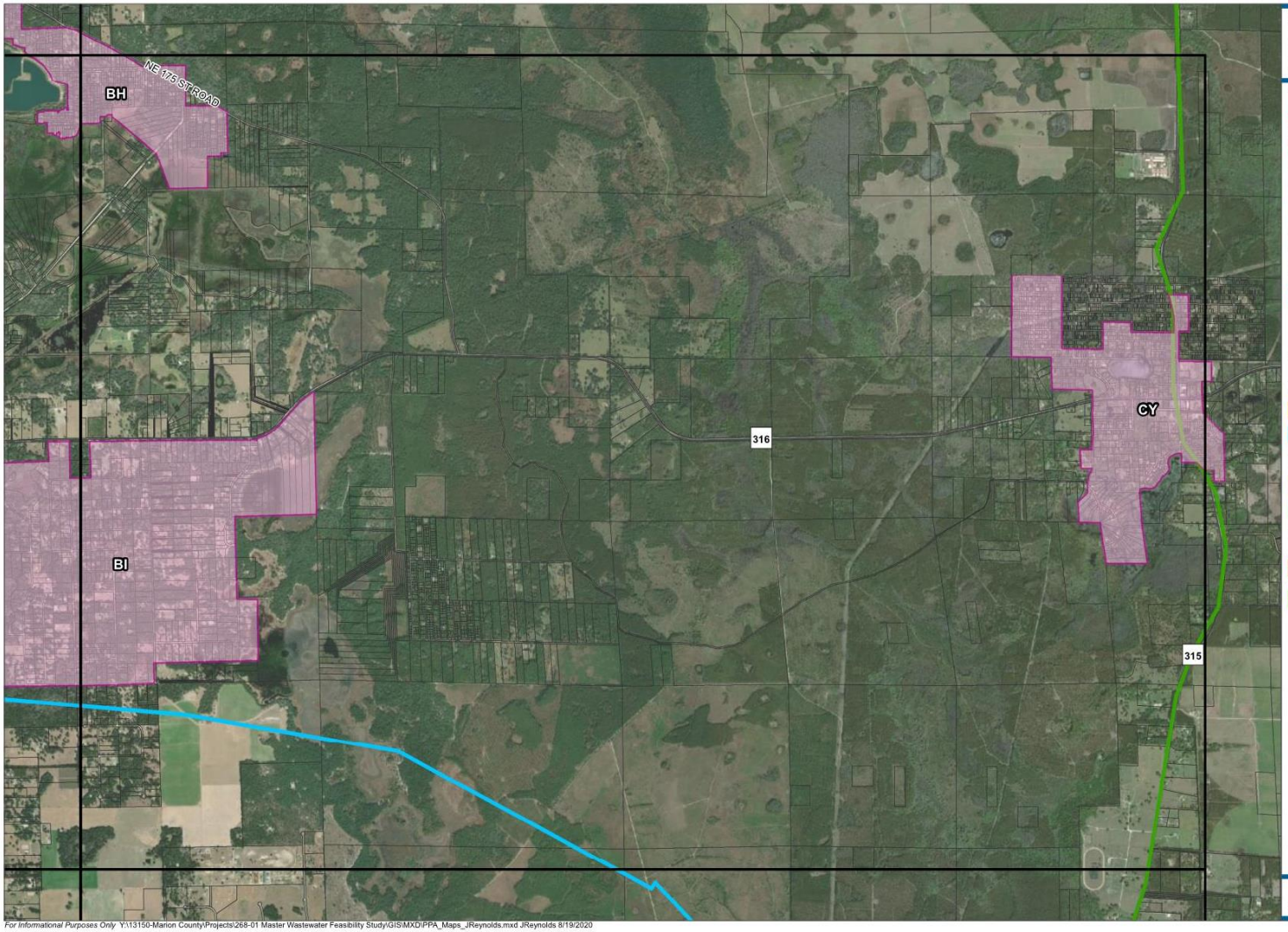
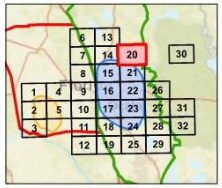


Grid 20

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

Priority Project

Wastewater Treatment Facility

Springs PFA

Main Map

Rainbow

Silver

Inset Map

Rainbow

Silver

BMAP

Rainbow Springs and Rainbow River

Silver Springs

City Boundary

Marion County Parcels

County Boundary

N

0 1,500 3,000

Feet

1:36,000

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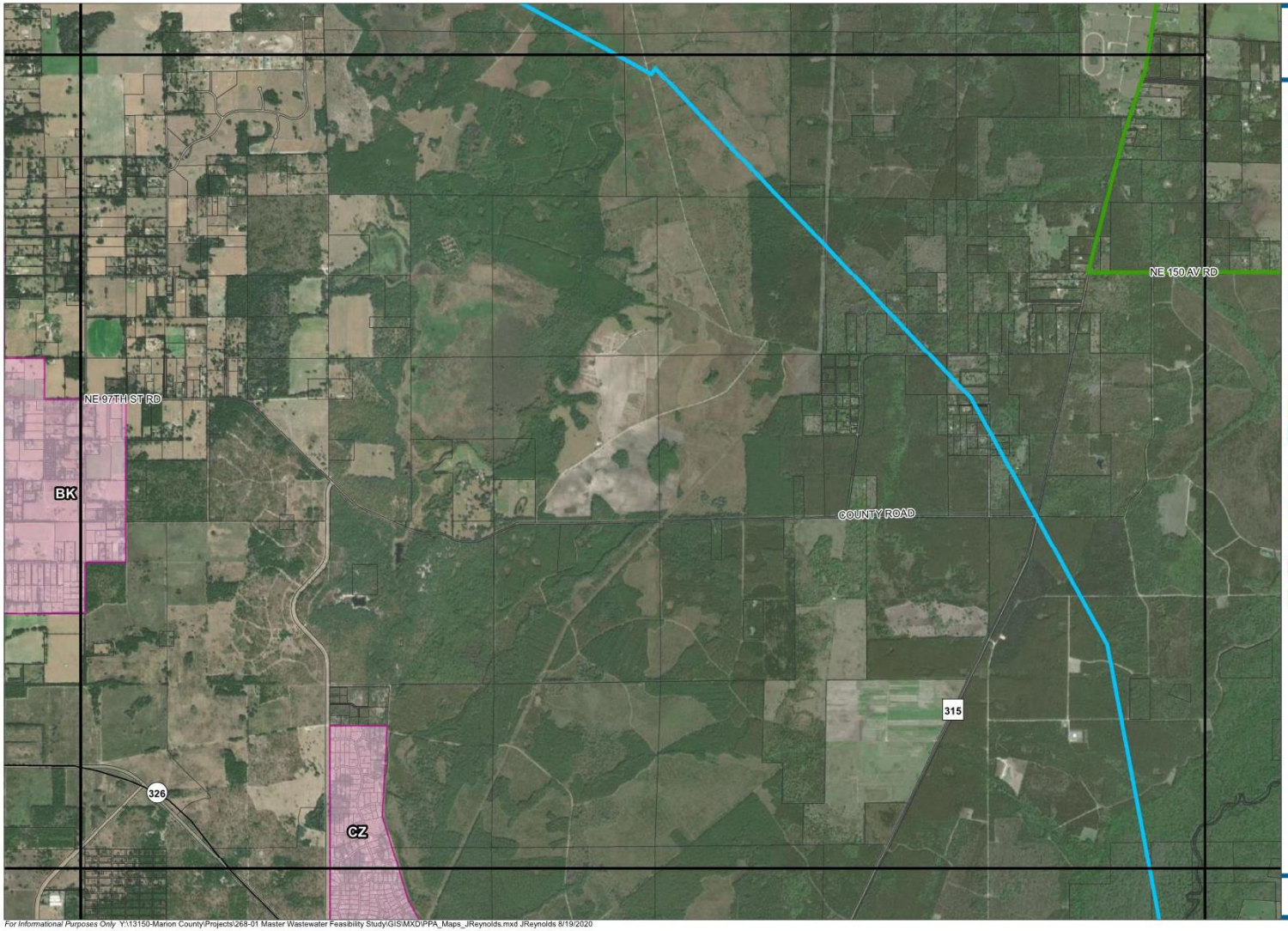
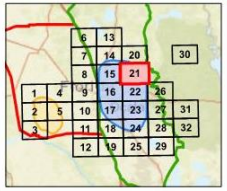


Grid 21

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

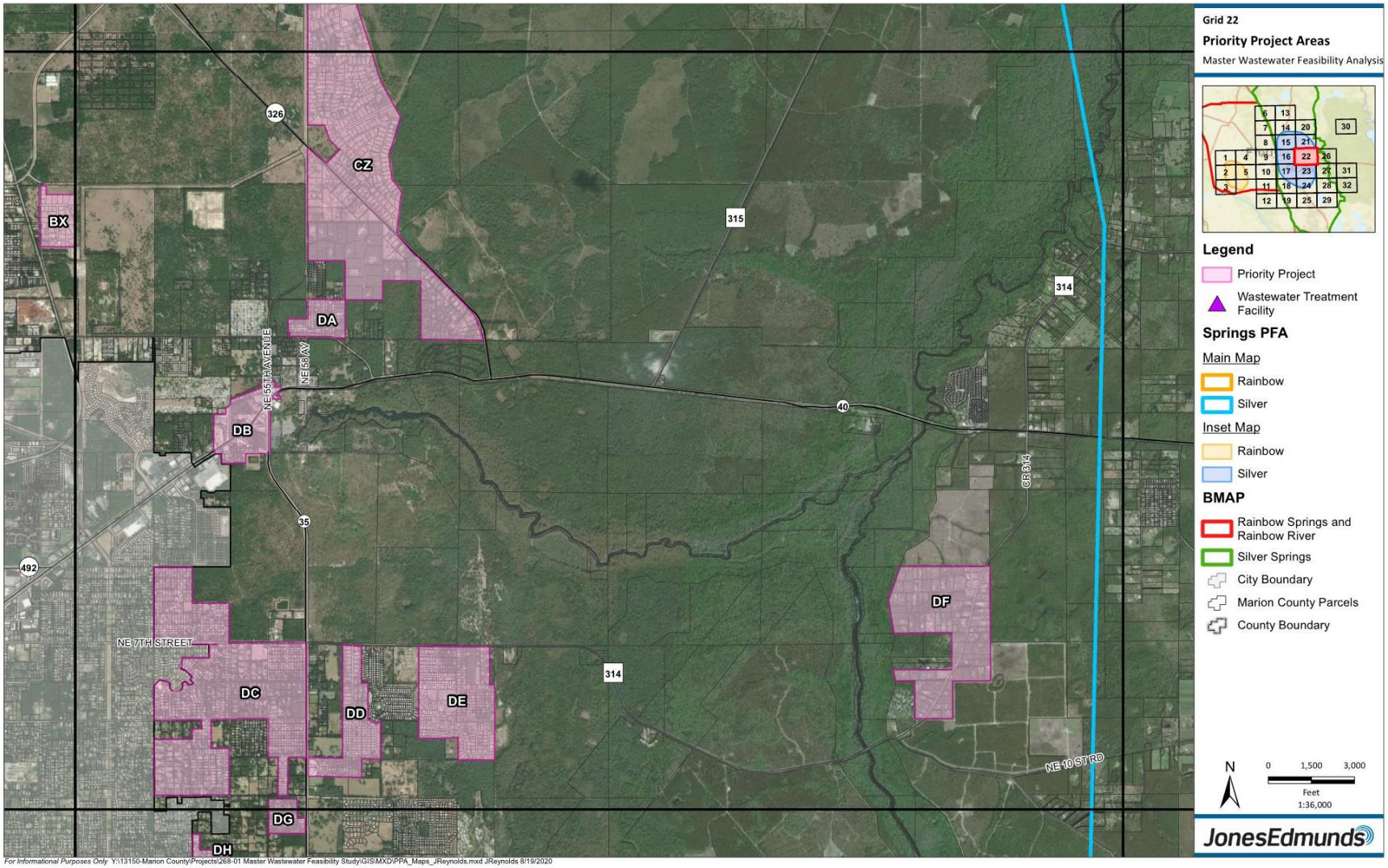
0 1,500 3,000

Feet

1:36,000

JonesEdmunds

For Informational Purposes Only Y:\13150-Marion County\Projects\268-01 Master Wastewater Feasibility Study\GIS\MXD\PPA_Maps_JReynolds.mxd JReynolds 8/19/2020



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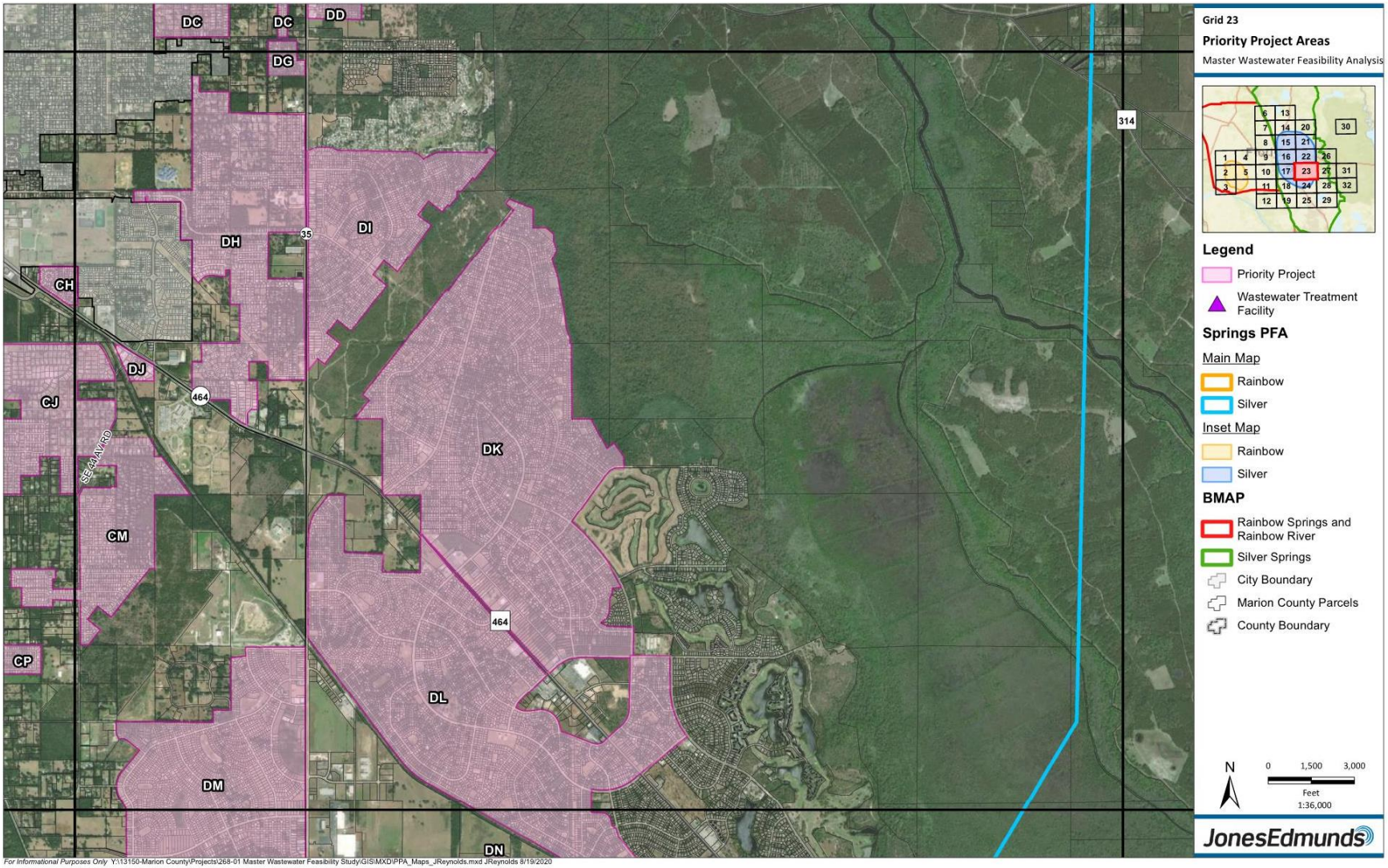

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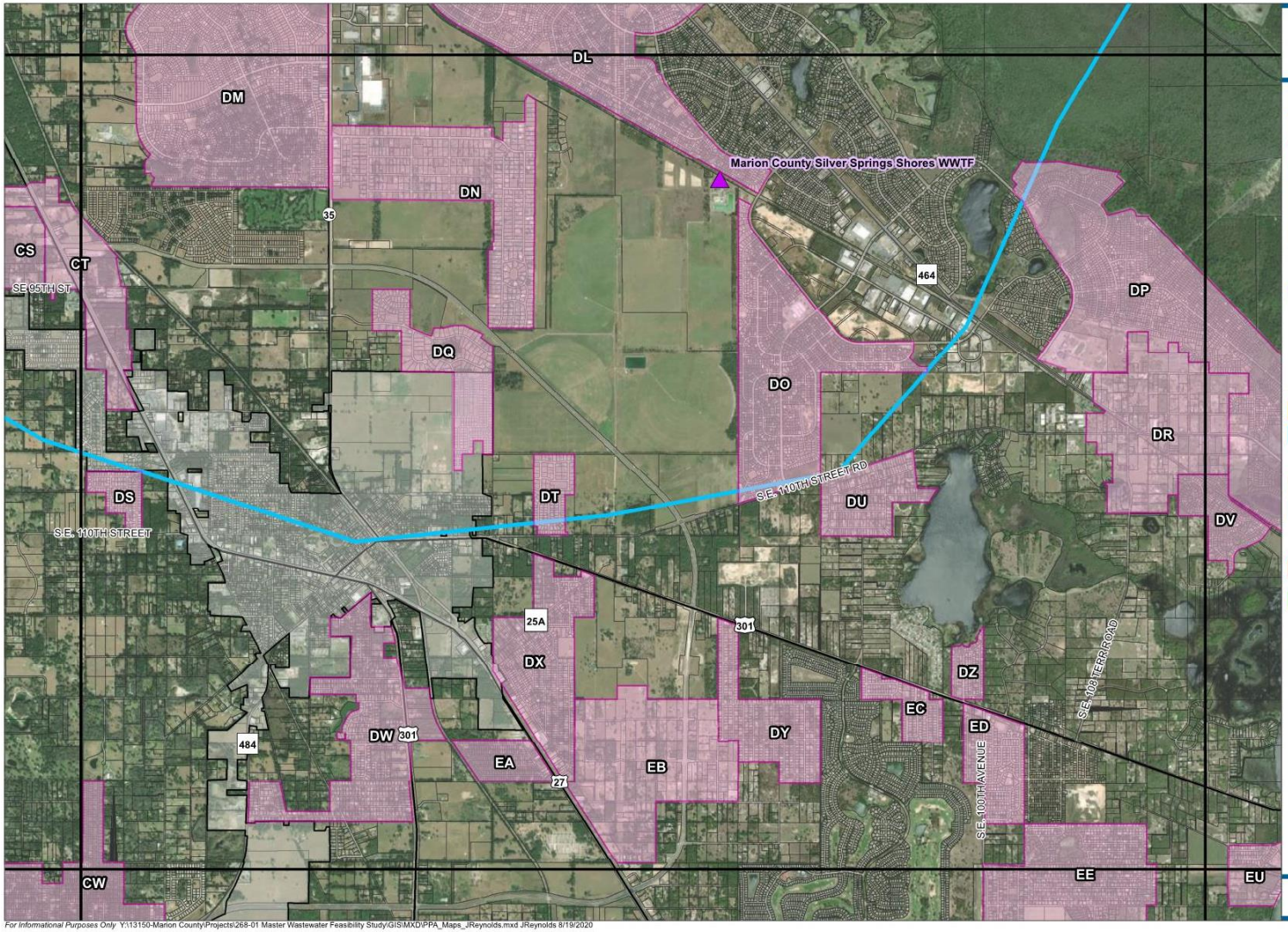
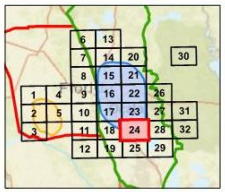


Grid 24

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
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BMAP

- Rainbow Springs and Rainbow River
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- City Boundary
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N

0 1,500 3,000

Feet

1:36,000

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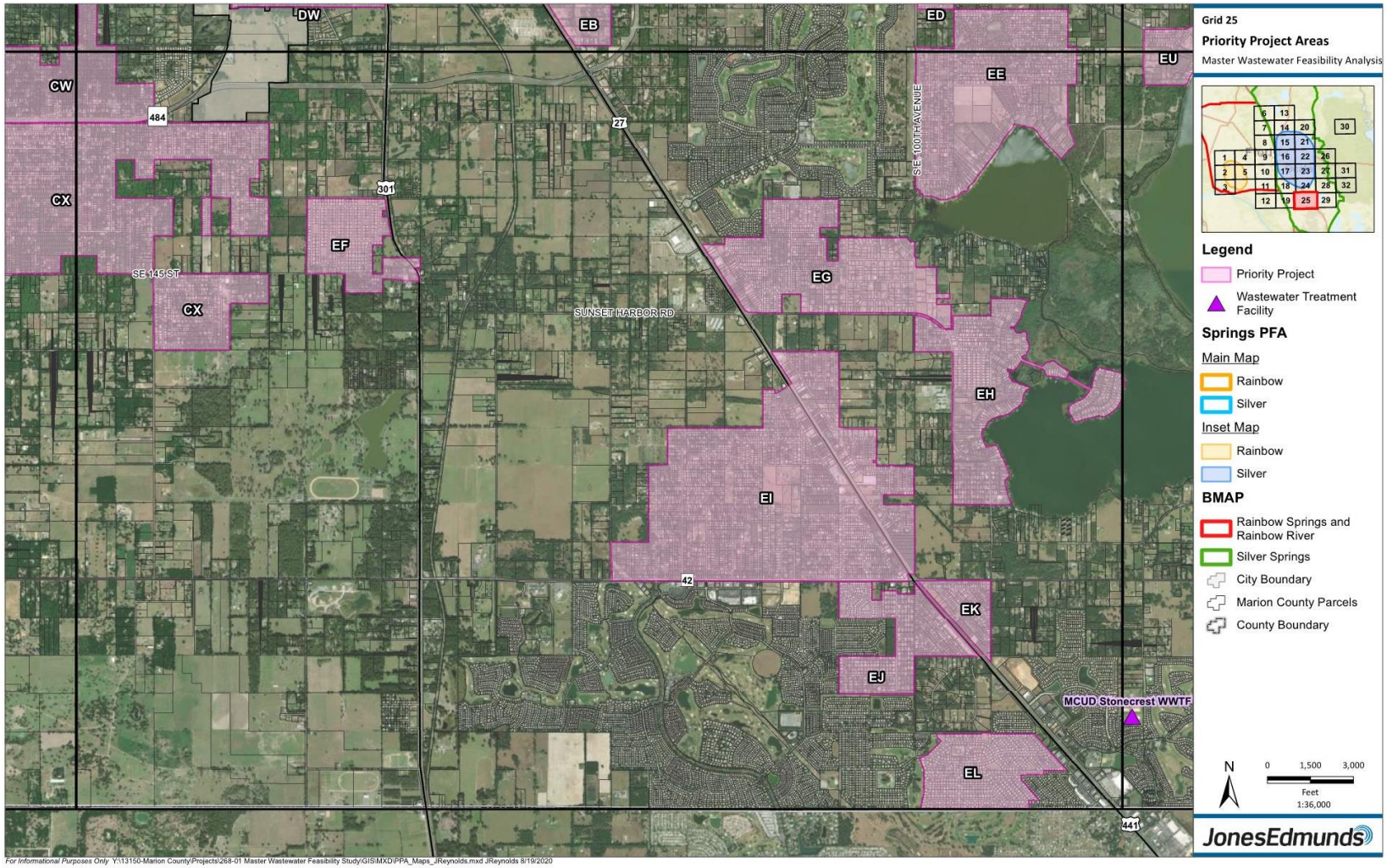

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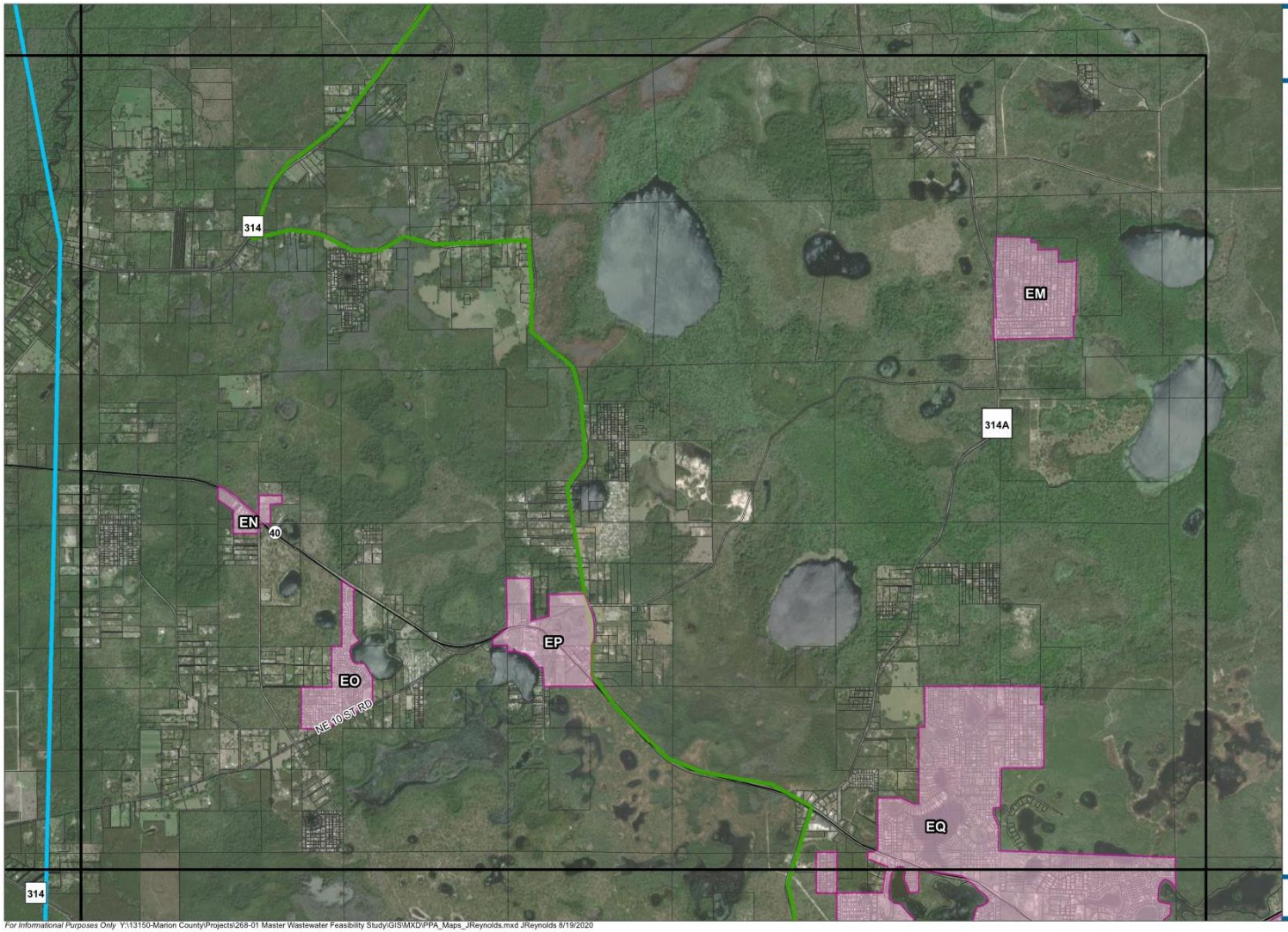
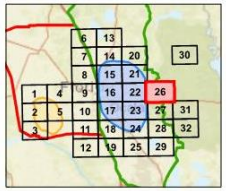


Grid 26

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

0 1,500 3,000

Feet

1:36,000

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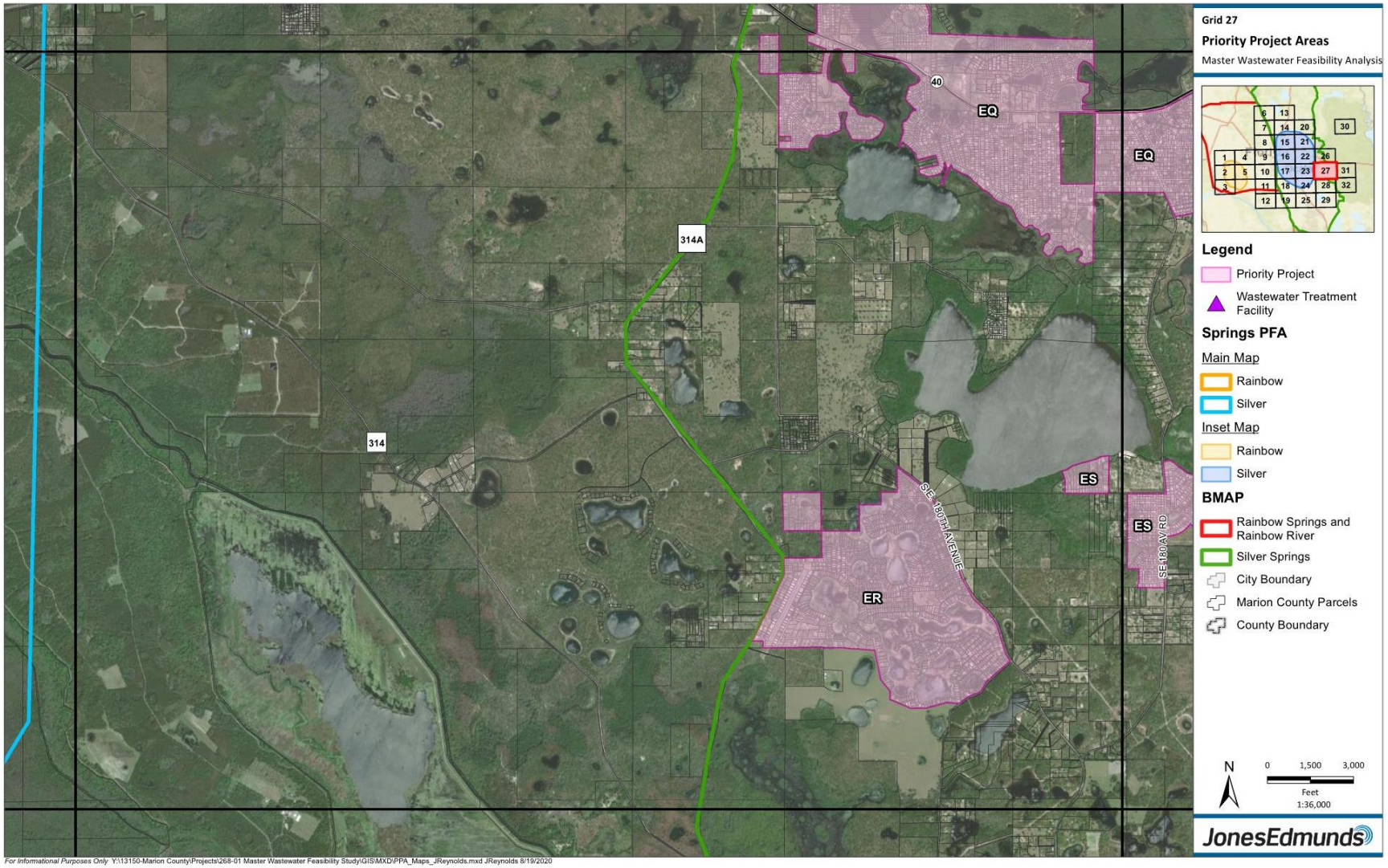

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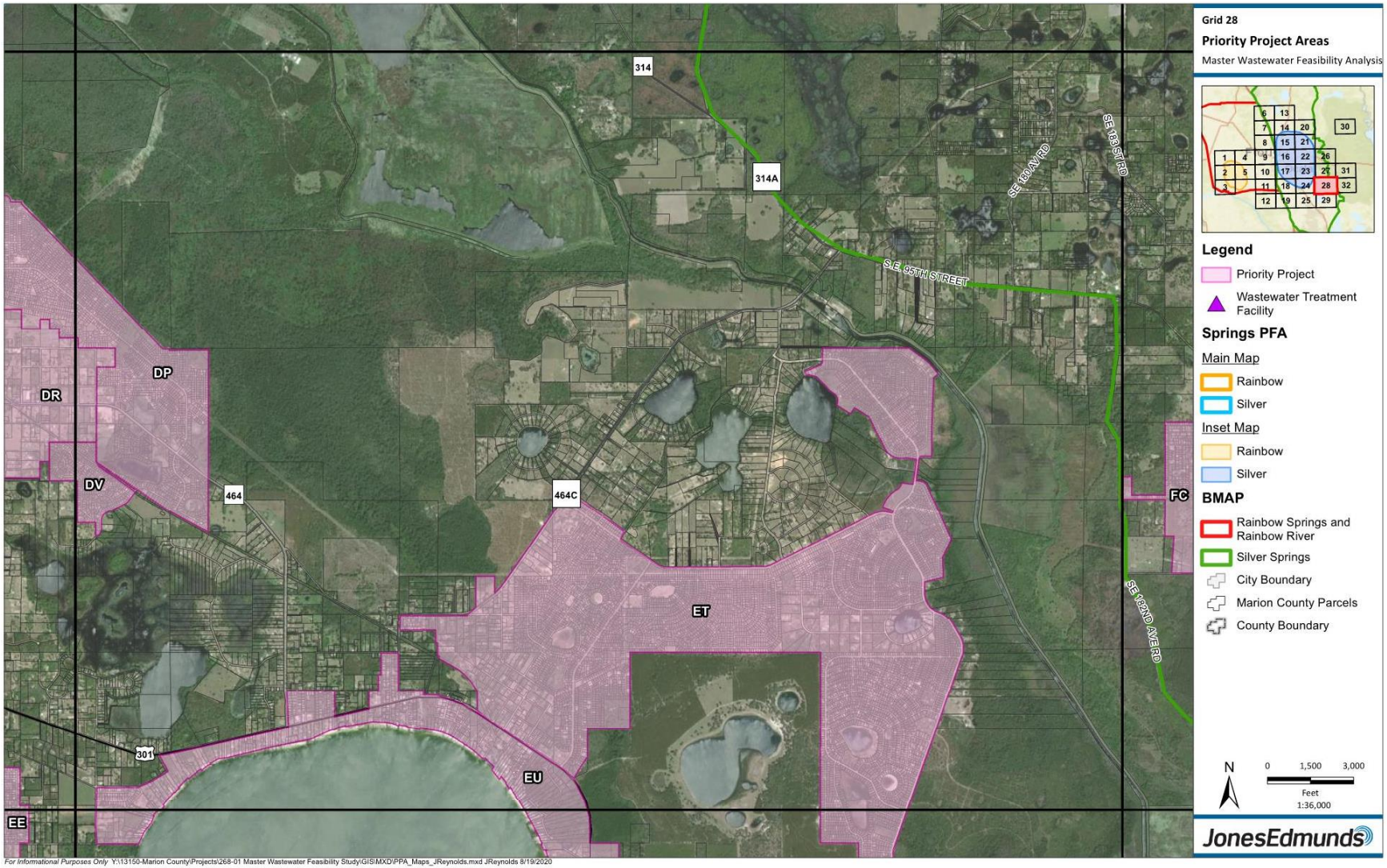

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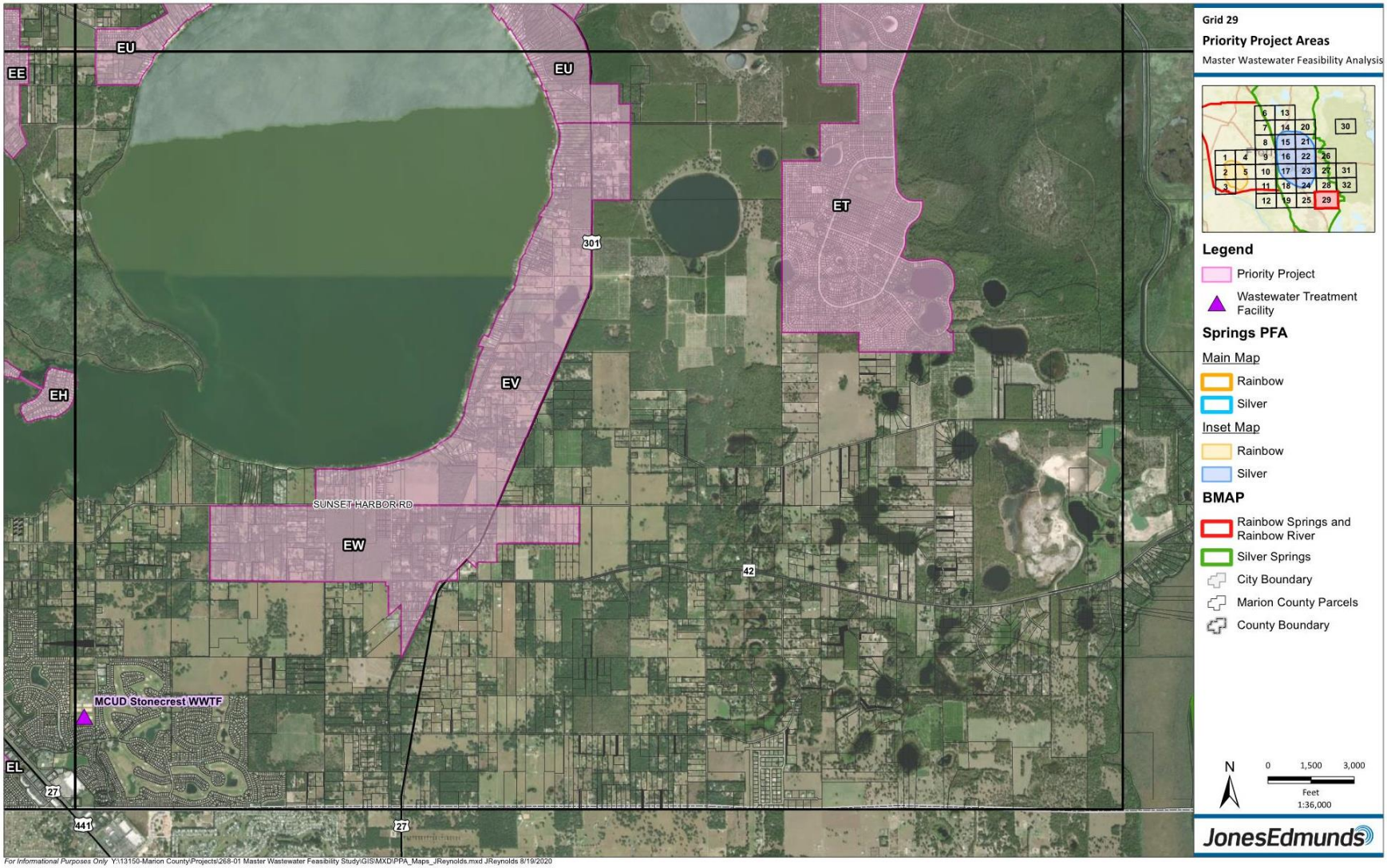

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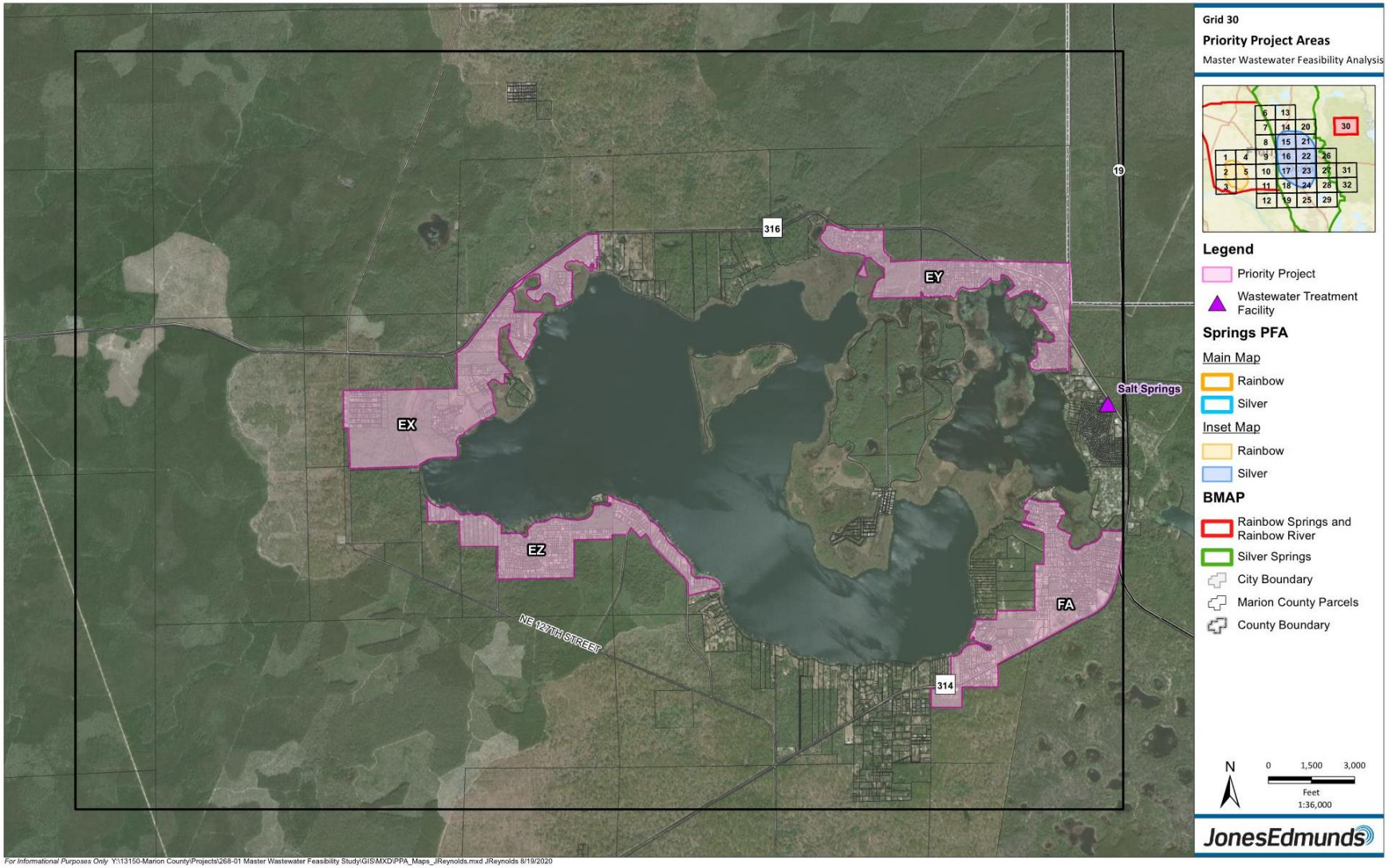

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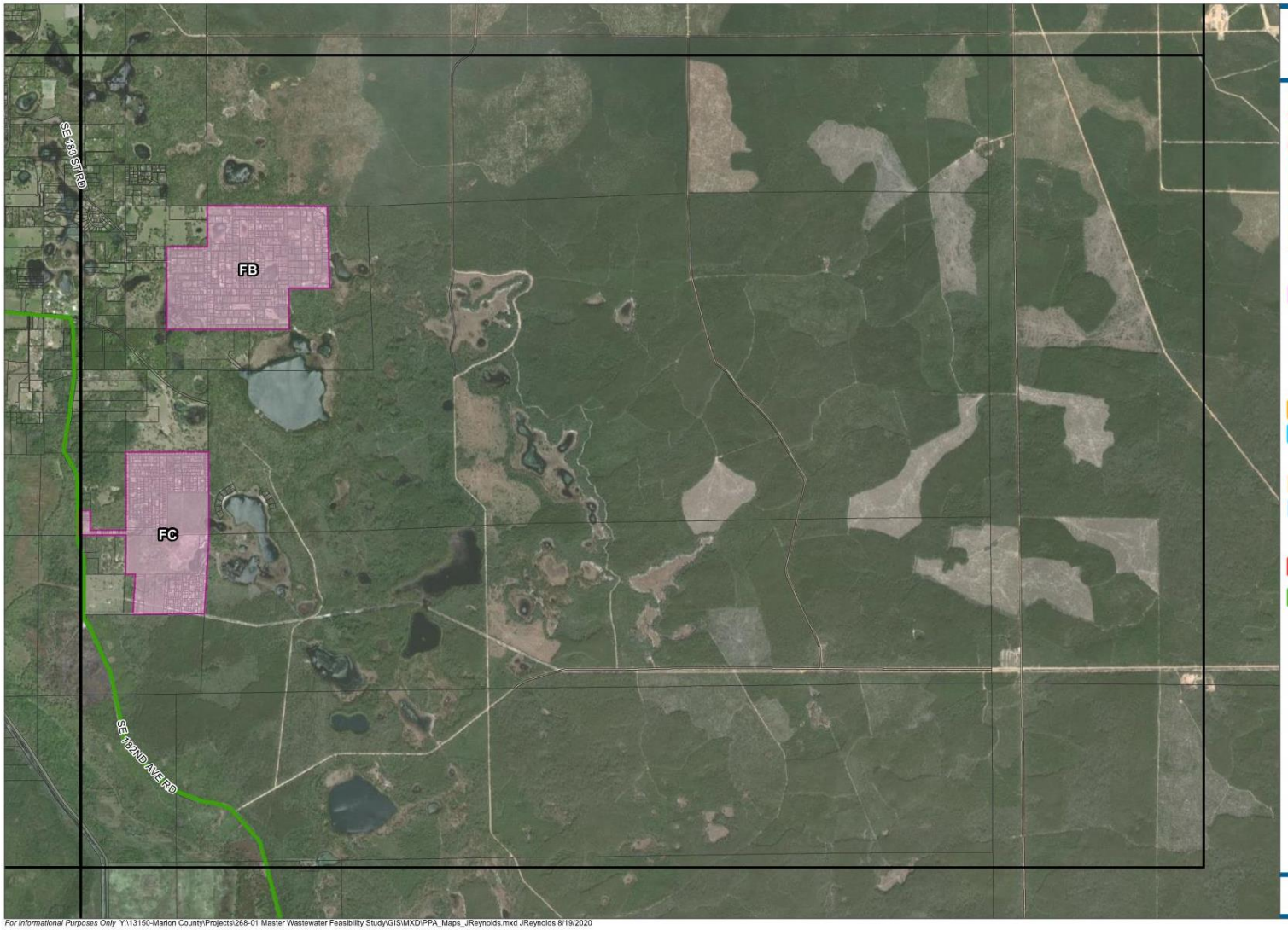
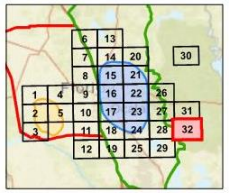


Grid 32

Priority Project Areas

Master Wastewater Feasibility Analysis



Legend

- Priority Project
- Wastewater Treatment Facility

Springs PFA

Main Map

- Rainbow
- Silver

Inset Map

- Rainbow
- Silver

BMAP

- Rainbow Springs and Rainbow River
- Silver Springs
- City Boundary
- Marion County Parcels
- County Boundary

N

0 1,500 3,000

Feet

1:36,000

JonesEdmunds

For Informational Purposes Only Y:\13150-Marion County\Projects\268-01 Master Wastewater Feasibility Study\GIS\MXD\PPA_Maps_JReynolds.mxd JReynolds 8/19/2020

Appendix D

PPA Detail Spreadsheet

Appendix D

PPA Detail Spreadsheet

PPA	BMAP	PFA	Nitrogen Load (lb-N/yr)	# OSTDS	# Parcels	Normalized Score	Cost per Lot (w/ transmission)	Cost per Lot (w/o transmission)	ATU Credit	Central Sewer Credit	Proposal	Cumulative Proposed Credit	Cumulative Total Cost (w/ transmission)
AA	Rainbow	None	7,100	850	9,474	0.00	26,010	25,626	4,615	6,745	ATU	4,615	246,421,000
AB	Rainbow	Rainbow	5,574	630	1,377	10.87	27,323	27,016	3,623	5,295	ATU	8,238	284,045,000
AC	Rainbow	Rainbow	5,670	916	1,572	7.07	42,800	42,288	3,685	5,386	ATU	11,923	351,326,000
AD	Rainbow	Rainbow	4,234	368	1,787	8.15	28,544	27,958	2,752	4,022	ATU	14,675	402,334,000
AE	Rainbow	Rainbow	1,472	178	396	1.63	46,240	43,544	956	1,398	ATU	15,632	420,645,000
AF	Rainbow	Rainbow	7,935	925	1,509	10.33	42,250	41,817	5,158	7,539	ATU	20,790	484,401,000
AG	Rainbow	Rainbow	2,543	285	586	5.43	25,988	25,176	1,653	2,416	ATU	22,443	499,630,000
AH	Rainbow	None	1,027	113	273	0.00	24,670	24,555	668	976	ATU	23,110	506,365,000
AI	Rainbow	None	1,310	146	209	0.00	41,976	39,548	851	1,244	ATU	23,962	515,138,000
AJ	Rainbow	None	6,146	738	1,484	0.00	29,596	28,693	3,995	5,839	ATU	27,956	559,059,000
AK	Rainbow	Rainbow	6,309	763	5,806	13.59	25,330	24,764	4,101	5,994	ATU	32,057	706,126,000
AL	Rainbow	Rainbow	4,168	562	1,198	5.98	39,687	38,638	2,709	3,959	ATU	34,766	753,671,000
AM	Silver	None	3,208	305	419	0.00	61,317	55,671	2,085	3,047	ATU	36,851	779,363,000
AN	Silver	None	4,473	299	435	0.00	63,168	58,638	2,907	4,249	ATU	39,758	806,841,000
AO	Silver	None	3,568	205	355	0.00	46,039	42,470	2,319	3,390	ATU	42,078	823,185,000
AP	Silver	Silver	1,750	110	249	1.09	73,827	73,827	1,138	1,663	ATU	43,215	841,568,000
AQ	Rainbow	None	12,794	1,540	2,502	0.00	27,442	27,105	8,316	12,154	ATU	51,531	910,228,000
AR	Rainbow	None	3,246	383	577	0.00	31,700	31,197	2,110	3,083	ATU	53,641	928,519,000
AS	Rainbow	None	3,656	440	460	0.00	27,952	27,610	2,377	3,474	ATU	56,018	941,377,000
AT	Rainbow	None	4,375	451	1,710	0.00	23,463	23,446	2,844	4,157	ATU	58,862	981,498,000
AU	Rainbow	None	590	72	97	0.00	27,918	26,294	384	561	ATU	59,245	984,206,000
AV	Rainbow	None	1,605	194	219	0.00	49,877	49,861	1,043	1,524	ATU	60,288	995,129,000
AW	Rainbow	None	2,236	271	298	0.00	48,302	48,114	1,454	2,125	ATU	61,742	1,009,523,000
AX	Rainbow	None	1,031	121	240	0.00	36,608	35,281	670	979	ATU	62,412	1,018,309,000
AY	Rainbow	None	918	94	125	0.00	26,832	26,300	597	872	ATU	63,009	1,021,663,000
AZ	Rainbow	None	1,879	226	289	0.00	33,457	32,875	1,221	1,785	ATU	64,230	1,031,332,000
BA	Rainbow	None	5,928	729	778	0.00	28,404	28,134	3,853	5,631	ATU	68,083	1,053,430,000
BB	Rainbow	None	7,012	842	897	0.00	34,031	33,711	4,558	6,662	ATU	72,641	1,083,956,000
BC	Rainbow	None	11,569	1,344	1,531	0.00	28,421	28,147	7,520	10,990	ATU	80,161	1,127,469,000
BD	Rainbow	None	24,576	2,993	4,735	0.00	25,840	25,541	15,974	23,347	ATU	96,135	1,249,820,162
BE	Rainbow	None	4,230	11	56	0.00	30,482	30,482	2,749	4,018	ATU	98,884	1,251,527,162
BF	None	None	49,700	4,955	23,003	0.00	27,843	27,447	32,305	47,215	ATU	131,189	1,891,997,162
BG	Silver	None	3,320	266	513	0.00	71,257	67,212	2,158	3,154	ATU	133,347	1,928,552,162
BH	Silver	None	2,321	511	1,500	0.00	35,121	33,469	1,509	2,205	ATU	134,855	1,981,234,162

PPA	BMAP	PFA	Nitrogen Load (lb-N/yr)	# OSTDS	# Parcels	Normalized Score	Cost per Lot (w/ transmission)	Cost per Lot (w/o transmission)	ATU Credit	Central Sewer Credit	Proposal	Cumulative Proposed Credit	Cumulative Total Cost (w/ transmission)
BI	Silver	Silver	2,286	505	673	3.80	33,620	31,581	1,486	2,172	ATU	136,341	2,003,860,162
BJ	Silver	Silver	1,617	114	153	2.72	34,118	26,775	1,051	1,536	ATU	137,392	2,009,080,162
BK	Silver	Silver	8,702	712	959	23.91	39,855	39,538	5,657	8,267	ATU	143,049	2,047,301,162
BL	Silver	Silver	152	132	343	0.00	48,198	47,045	99	145	ATU	143,148	2,063,833,162
BM	Silver	Silver	278	57	291	0.54	28,120	27,459	181	264	ATU	143,328	2,072,016,162
BN	Silver	Silver	2,755	378	602	4.89	31,286	31,042	1,791	2,617	ATU	145,119	2,090,850,162
BO	Silver	Silver	981	125	144	2.72	40,813	35,684	638	932	ATU	145,757	2,096,727,162
BP	Silver	Silver	1,679	211	228	2.72	34,035	32,868	1,092	1,595	ATU	146,848	2,104,487,162
BQ	Silver	Silver	1,542	203	228	5.43	32,061	31,094	1,002	1,465	ATU	147,850	2,111,797,162
BR	Silver	Silver	3,723	459	514	13.59	30,263	29,017	2,420	3,537	ATU	150,271	2,127,352,162
BS	Silver	Silver	965	172	229	3.80	28,773	26,817	627	917	ATU	150,898	2,133,941,162
BT	Silver	Silver	283	84	102	0.54	27,510	26,755	184	269	ATU	151,082	2,136,747,162
BU	Silver	Silver	399	49	57	0.54	32,439	30,965	259	379	ATU	151,341	2,138,596,162
BV	Silver	Silver	1,534	307	346	5.43	30,361	29,734	997	1,458	ATU	152,338	2,149,101,162
BW	Silver	Silver	4,665	829	878	16.85	29,703	29,296	3,032	4,432	ATU	155,370	2,175,180,162
BX	Silver	Silver	180	40	42	0.54	48,786	40,952	117	171	ATU	155,488	2,177,229,162
BY	Silver	Silver	1,347	206	277	3.80	36,188	36,188	876	1,280	ATU	156,363	2,187,253,162
BZ	Silver	Silver	961	214	242	3.80	26,351	25,628	624	913	ATU	156,988	2,193,630,162
CA	Silver	Silver	617	135	160	2.72	27,119	26,025	401	586	ATU	157,389	2,197,969,162
CB	Silver	Silver	1,849	398	426	7.07	28,209	27,527	1,202	1,756	ATU	158,590	2,209,986,162
CC	Rainbow	None	781	96	106	0.00	26,858	26,858	508	742	ATU	159,098	2,212,833,162
CD	Silver	Silver	9,077	434	647	10.33	48,798	48,798	5,900	8,623	ATU	164,998	2,244,405,162
CE	Silver	Silver	3,915	475	695	6.52	33,708	33,305	2,545	3,720	ATU	167,543	2,267,832,162
CF	Silver	Silver	1,389	167	207	2.72	28,029	27,319	903	1,320	ATU	168,446	2,273,634,162
CG	Silver	Silver	5,613	632	688	9.78	30,749	30,342	3,649	5,332	ATU	172,095	2,294,789,162
CH	Silver	Silver	790	96	115	3.26	25,704	25,339	513	750	ATU	172,608	2,297,745,162
CI	Silver	Silver	715	86	105	1.09	33,924	33,890	465	679	ATU	173,073	2,301,307,162
CJ	Silver	Silver	5,005	622	711	8.70	31,283	30,594	3,253	4,755	ATU	176,326	2,323,549,162
CK	Silver	Silver	557	67	72	1.09	36,778	36,486	362	529	ATU	176,688	2,326,197,162
CL	Silver	Silver	2,155	244	286	3.26	34,626	33,598	1,401	2,048	ATU	178,089	2,336,100,162
CM	Silver	Silver	5,520	678	738	10.33	28,673	28,019	3,588	5,244	ATU	181,677	2,357,261,162
CN	Silver	Silver	1,721	209	268	2.72	34,179	32,481	1,119	1,635	ATU	182,796	2,366,421,162
CO	Silver	Silver	1,463	178	209	2.72	30,225	27,713	951	1,390	ATU	183,747	2,372,738,162
CP	Silver	Silver	607	73	76	1.09	37,079	31,322	394	577	ATU	184,142	2,375,556,162
CQ	Silver	None	5,197	581	720	0.00	28,264	27,656	3,378	4,937	ATU	187,519	2,395,906,162
CR	Silver	Silver	492	63	71	0.54	63,634	53,528	320	468	ATU	187,839	2,400,424,162
CS	Silver	Silver	1,033	163	187	2.17	25,647	24,917	671	981	ATU	188,511	2,405,220,162
CT	Silver	Silver	945	47	76	1.63	28,711	28,480	614	898	ATU	189,125	2,407,402,162

PPA	BMAP	PFA	Nitrogen Load (lb-N/yr)	# OSTDS	# Parcels	Normalized Score	Cost per Lot (w/ transmission)	Cost per Lot (w/o transmission)	ATU Credit	Central Sewer Credit	Proposal	Cumulative Proposed Credit	Cumulative Total Cost (w/ transmission)
CU	Silver	None	1,205	54	65	0.00	48,354	40,492	784	1,145	ATU	189,908	2,410,545,162
CV	Silver	None	1,409	106	161	0.00	59,466	58,944	916	1,339	ATU	190,824	2,420,119,162
CW	Silver	None	2,355	322	937	0.00	32,277	31,904	1,530	2,237	ATU	192,355	2,450,363,162
CX	Silver	None	9,933	1,666	3,825	0.00	25,239	25,050	6,457	9,437	ATU	198,811	2,546,903,162
CY	Silver	None	2,382	273	610	0.00	44,611	40,687	1,548	2,263	ATU	200,360	2,574,116,162
CZ	Silver	Silver	1,134	354	463	2.72	42,106	40,934	737	1,078	ATU	201,097	2,593,611,162
DA	Silver	Silver	318	122	149	1.09	29,550	29,550	207	302	ATU	201,304	2,598,014,162
DB	Silver	Silver	312	28	74	1.09	28,270	28,270	203	297	ATU	201,507	2,600,106,162
DC	Silver	Silver	6,860	929	1,046	23.37	32,272	31,737	4,459	6,517	CS	208,023	2,633,863,162
DD	Silver	Silver	1,576	182	204	5.98	29,025	29,025	1,024	1,497	ATU	209,048	2,639,784,162
DE	Silver	Silver	938	328	423	3.26	29,688	29,349	610	891	ATU	209,657	2,652,342,162
DF	Silver	Silver	374	77	110	0.54	49,964	44,395	243	355	ATU	209,901	2,657,838,162
DG	Silver	Silver	553	65	70	1.63	31,686	31,586	360	526	ATU	210,260	2,660,056,162
DH	Silver	Silver	13,172	1,108	1,311	45.11	31,699	31,272	8,562	12,514	CS	222,774	2,701,613,162
DI	Silver	Silver	10,178	1,185	1,492	44.57	24,814	24,532	6,616	9,669	CS	232,443	2,738,635,162
DJ	Silver	Silver	431	22	29	0.54	42,621	41,172	280	410	ATU	232,723	2,739,871,162
DK	Silver	Silver	23,752	2,831	4,558	100.00	25,871	25,502	15,439	22,565	CS	255,288	2,857,791,162
DL	Silver	Silver	16,547	1,861	4,246	36.41	24,786	24,423	10,756	15,720	CS	271,008	2,963,031,162
DM	Silver	Silver	9,049	993	2,744	19.02	25,586	25,226	5,882	8,597	ATU	276,890	3,033,239,162
DN	Silver	Silver	2,194	347	451	2.72	46,665	46,665	1,426	2,084	ATU	278,316	3,054,285,162
DO	Silver	Silver	2,285	287	1,229	4.89	25,963	25,621	1,485	2,171	ATU	279,801	3,086,193,162
DP	Silver	Silver	5,915	184	2,174	0.00	26,162	25,776	3,845	5,619	ATU	283,646	3,143,069,162
DQ	Silver	Silver	376	80	356	0.00	25,126	25,126	244	357	ATU	283,890	3,152,014,162
DR	Silver	None	1,175	128	170	0.00	26,106	24,809	764	1,116	ATU	284,654	3,156,452,162
DS	Silver	None	1,039	129	138	2.17	28,449	27,739	675	987	ATU	285,330	3,160,378,162
DT	Silver	Silver	644	118	143	1.09	32,196	31,364	418	612	ATU	285,748	3,164,982,162
DU	Silver	None	570	137	232	0.00	28,401	28,401	370	541	ATU	286,119	3,171,571,162
DV	Silver	None	61	14	270	0.00	27,152	25,337	40	58	ATU	286,158	3,178,902,162
DW	Silver	None	4,087	555	698	7.61	29,822	29,416	2,656	3,882	ATU	288,814	3,199,718,162
DX	Silver	None	2,699	490	598	5.43	28,360	28,090	1,754	2,564	ATU	290,569	3,216,677,162
DY	Silver	None	2,116	294	474	0.00	29,243	28,622	1,376	2,011	ATU	291,945	3,230,538,162
DZ	Silver	None	407	89	123	0.00	26,772	25,862	265	387	ATU	292,209	3,233,831,162
EA	Silver	None	243	45	211	0.00	22,469	22,436	158	231	ATU	292,368	3,238,572,162
EB	Silver	None	830	125	160	0.00	25,844	24,947	539	788	ATU	292,907	3,242,707,162
EC	Silver	None	843	162	187	0.00	26,439	26,420	548	800	ATU	293,454	3,247,651,162
ED	Silver	None	2,049	232	349	0.00	27,226	26,434	1,332	1,946	ATU	294,786	3,257,153,162
EE	Silver	None	3,452	634	1,106	0.00	27,748	27,438	2,244	3,280	ATU	297,030	3,287,842,162
EF	Silver	None	2,922	351	441	0.00	27,322	26,473	1,899	2,776	ATU	298,929	3,299,891,162

PPA	BMAP	PFA	Nitrogen Load (lb-N/yr)	# OSTDS	# Parcels	Normalized Score	Cost per Lot (w/ transmission)	Cost per Lot (w/o transmission)	ATU Credit	Central Sewer Credit	Proposal	Cumulative Proposed Credit	Cumulative Total Cost (w/ transmission)
EG	Silver	None	3,883	759	952	0.00	27,436	27,134	2,524	3,689	ATU	301,453	3,326,010,162
EH	Silver	None	1,698	567	734	0.00	30,056	29,507	1,104	1,614	ATU	302,557	3,348,071,162
EI	Silver	None	7,173	1,157	2,697	0.00	29,082	28,666	4,663	6,815	ATU	307,220	3,426,504,162
EJ	Silver	None	2,306	467	551	0.00	32,528	31,766	1,499	2,191	ATU	308,719	3,444,427,162
EK	Silver	None	880	177	218	0.00	28,326	28,326	572	836	ATU	309,291	3,450,602,162
EL	Silver	None	2,626	568	636	0.00	30,619	30,399	1,707	2,494	ATU	310,998	3,470,076,162
EM	None	None	2,106	224	494	0.00	32,032	27,399	1,369	2,001	ATU	312,367	3,485,900,162
EN	Silver	None	76	10	24	0.00	101,458	56,396	49	72	ATU	312,416	3,488,335,162
EO	Silver	None	1,102	175	295	0.00	32,298	27,908	716	1,047	ATU	313,132	3,497,863,162
EP	Silver	None	989	39	59	0.00	149,000	108,839	643	939	ATU	313,775	3,506,654,162
EQ	None	None	20,365	2,040	2,922	0.00	32,176	31,148	13,237	19,347	ATU	327,012	3,600,672,162
ER	None	None	5,853	637	1,235	0.00	28,546	26,460	3,804	5,560	ATU	330,817	3,635,926,162
ES	None	None	2,836	307	446	0.00	34,906	28,895	1,843	2,694	ATU	332,660	3,651,494,162
ET	Silver	None	1,513	424	7,537	0.00	26,439	25,783	984	1,437	ATU	333,643	3,850,764,162
EU	Silver	None	1,514	490	630	0.00	25,875	24,819	984	1,439	ATU	334,628	3,867,065,162
EV	Silver	None	1,347	223	360	0.00	47,372	45,788	876	1,280	ATU	335,503	3,884,119,162
EW	Silver	None	2,190	240	386	0.00	49,026	48,237	1,423	2,080	ATU	336,927	3,903,043,162
EX	None	None	2,117	219	348	0.00	33,842	31,740	1,376	2,011	ATU	338,303	3,914,820,162
EY	None	None	2,963	285	416	0.00	34,000	33,520	1,926	2,815	ATU	340,229	3,928,964,162
EZ	None	None	1,423	173	373	0.00	34,437	32,185	925	1,351	ATU	341,153	3,941,809,162
FA	None	None	5,186	466	587	0.00	36,838	36,588	3,371	4,927	ATU	344,524	3,963,433,162
FB	None	None	2,688	271	507	0.00	49,988	45,156	1,747	2,553	ATU	346,271	3,988,777,162
FC	None	None	2,228	229	461	0.00	39,931	34,464	1,448	2,116	ATU	347,719	4,007,185,162

Appendix E

PPA EOPCCs

PPA AA

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	658,000	100	$ 65,800,000
2	Sod[3]	SY	18,700	7	$ 130,900
3	Abandon Septic Tanks	EA	850	1000	$ 850,000
4	On-Lot Connections	EA	850	0	$ -
				General Costs Subtotal	$ 66,781,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	1,450	9000	$ 13,050,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	492,800	130	$ 64,064,000
	10-inch diameter	LF	164,300	150	$ 24,645,000
	PVC SDR 26				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	284,300	40	$ 11,372,000
8	Construct 6-inch Diameter PVC Force Main	LF	103,900	35	$ 3,636,500
9	Construct Lift Station	LS	25	450000	$ 11,250,000
				Gravity System Subtotal	$ 128,018,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 29,219,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 19,479,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 2,922,000
	TOTAL EOPCC				**$ 246,421,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AB

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	93,000	100	$ 9,300,000
2	Sod[3]	SY	13,900	7	$ 97,300
3	Abandon Septic Tanks	EA	630	1000	$ 630,000
4	On-Lot Connections	EA	630	0	$ -
				General Costs Subtotal	$ 10,028,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	210	9000	$ 1,890,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	92,300	150	$ 13,845,000
	PVC SDR 26				
	Maximum depth 19 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	41,100	40	$ 1,644,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,100	35	$ 423,500
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 19,603,000
10	Special case - grinder pump stations	EA	7	20,000	$ 140,000
11	Overhead and Profit (15%)				$ 4,444,650
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,963,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 444,500
	TOTAL EOPCC				**$ 37,624,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AC

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	175,000	100	$ 17,500,000
2	Sod[3]	SY	20,200	7	$ 141,400
3	Abandon Septic Tanks	EA	916	1000	$ 916,000
4	On-Lot Connections	EA	916	0	$ -
				General Costs Subtotal	$ 18,558,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	390	9000	$ 3,510,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	174,500	150	$ 26,175,000
	PVC SDR 26				
	Maximum depth 20 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	47,200	40	$ 1,888,000
8	Construct 6-inch Diameter PVC Force Main	LF	23,000	35	$ 805,000
9	Construct Lift Station	LS	5	450000	$ 2,250,000
				Gravity System Subtotal	$ 34,628,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 7,977,900
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 5,318,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 797,800
	TOTAL EOPCC				**$ 67,281,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AD

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	138,000	100	$ 13,800,000
2	Sod[3]	SY	8,100	7	$ 56,700
3	Abandon Septic Tanks	EA	368	1000	$ 368,000
4	On-Lot Connections	EA	368	0	$ -
				General Costs Subtotal	$ 14,225,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	310	9000	$ 2,790,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	137,400	130	$ 17,862,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	53,700	40	$ 2,148,000
8	Construct 6-inch Diameter PVC Force Main	LF	29,900	35	$ 1,046,500
9	Construct Lift Station	LS	5	450000	$ 2,250,000
				Gravity System Subtotal	$ 26,097,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 6,048,300
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 4,032,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 604,900
	TOTAL EOPCC				**$ 51,008,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AE

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	44,000	100	$ 4,400,000
2	Sod[3]	SY	4,000	7	$ 28,000
3	Abandon Septic Tanks	EA	178	1000	$ 178,000
4	On-Lot Connections	EA	178	0	$ -
				General Costs Subtotal	$ 4,606,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	100	9000	$ 900,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	43,500	150	$ 6,525,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	11,900	40	$ 476,000
8	Construct 6-inch Diameter PVC Force Main	LF	30,500	35	$ 1,067,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 9,869,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,171,250
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,447,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 217,200
	TOTAL EOPCC				**$ 18,311,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AF

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	167,000	100	$ 16,700,000
2	Sod[3]	SY	20,400	7	$ 142,800
3	Abandon Septic Tanks	EA	925	1000	$ 925,000
4	On-Lot Connections	EA	925	0	$ -
				General Costs Subtotal	$ 17,768,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	370	9000	$ 3,330,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	166,900	150	$ 25,035,000
	PVC SDR 26				
	Maximum depth 20 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	45,300	40	$ 1,812,000
8	Construct 6-inch Diameter PVC Force Main	LF	18,700	35	$ 654,500
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 32,632,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 7,560,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 5,040,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 756,000
	TOTAL EOPCC				**$ 63,756,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AG

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	19,000	100	$ 1,900,000
2	Sod[3]	SY	6,300	7	$ 44,100
3	Abandon Septic Tanks	EA	285	1000	$ 285,000
4	On-Lot Connections	EA	285	0	$ -
				General Costs Subtotal	$ 2,230,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	50	9000	$ 450,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	18,300	150	$ 2,745,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	7,400	40	$ 296,000
8	Construct 6-inch Diameter PVC Force Main	LF	13,600	35	$ 476,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 4,417,000
10	Special case - grinder pump stations	EA	341	20,000	$ 6,820,000
11	Overhead and Profit (15%)				$ 997,050
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 664,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 99,800
	TOTAL EOPCC				**$ 15,229,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AH

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	44,000	100	$ 4,400,000
2	Sod[3]	SY	2,500	7	$ 17,500
3	Abandon Septic Tanks	EA	113	1000	$ 113,000
4	On-Lot Connections	EA	113	0	$ -
				General Costs Subtotal	$ 4,531,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	100	9000	$ 900,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	43,700	130	$ 5,681,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,200	40	$ 328,000
8	Construct 6-inch Diameter PVC Force Main	LF	900	35	$ 31,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 7,391,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,788,300
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,192,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 178,900
	TOTAL EOPCC				**$ 15,082,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AI

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	20,000	100	$ 2,000,000
2	Sod[3]	SY	3,300	7	$ 23,100
3	Abandon Septic Tanks	EA	146	1000	$ 146,000
4	On-Lot Connections	EA	146	0	$ -
				General Costs Subtotal	$ 2,170,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	50	9000	$ 450,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	19,300	130	$ 2,509,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,000	40	$ 240,000
8	Construct 6-inch Diameter PVC Force Main	LF	14,500	35	$ 507,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 4,607,000
10	Special case - grinder pump stations	EA	10	20,000	$ 200,000
11	Overhead and Profit (15%)				$ 1,016,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 677,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 101,700
	TOTAL EOPCC				**$ 8,773,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AJ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	116,000	100	$ 11,600,000
2	Sod[3]	SY	16,300	7	$ 114,100
3	Abandon Septic Tanks	EA	738	1000	$ 738,000
4	On-Lot Connections	EA	738	0	$ -
				General Costs Subtotal	$ 12,453,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	260	9000	$ 2,340,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	115,400	130	$ 15,002,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 17 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	44,600	40	$ 1,784,000
8	Construct 6-inch Diameter PVC Force Main	LF	38,300	35	$ 1,340,500
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 22,267,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 5,208,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 3,472,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 520,800
	TOTAL EOPCC				**$ 43,921,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

PPA AK

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	394,000	100	$ 39,400,000
2	Sod[3]	SY	16,800	7	$ 117,600
3	Abandon Septic Tanks	EA	763	1000	$ 763,000
4	On-Lot Connections	EA	763	0	$ -
				General Costs Subtotal	$ 40,281,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	870	9000	$ 7,830,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	393,400	130	$ 51,142,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth XX feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	174,200	40	$ 6,968,000
8	Construct 6-inch Diameter PVC Force Main	LF	93,900	35	$ 3,286,500
9	Construct Lift Station	LS	15	450000	$ 6,750,000
				Gravity System Subtotal	$ 75,977,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 17,438,700
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 11,625,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,743,900
	TOTAL EOPCC				**$ 147,067,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AL

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	118,000	100	$ 11,800,000
2	Sod[3]	SY	12,400	7	$ 86,800
3	Abandon Septic Tanks	EA	562	1000	$ 562,000
4	On-Lot Connections	EA	562	0	$ -
				General Costs Subtotal	$ 12,449,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	260	9000	$ 2,340,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	117,200	150	$ 17,580,000
	PVC SDR 26				
	Maximum depth 28 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	33,600	40	$ 1,344,000
8	Construct 6-inch Diameter PVC Force Main	LF	35,900	35	$ 1,256,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 23,871,000
10	Special case - grinder pump stations	EA	80	20,000	$ 1,600,000
11	Overhead and Profit (15%)				$ 5,448,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 3,632,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 544,800
	TOTAL EOPCC				**$ 47,545,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AM

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	8,000	100	$ 800,000
2	Sod[3]	SY	6,800	7	$ 47,600
3	Abandon Septic Tanks	EA	305	1000	$ 305,000
4	On-Lot Connections	EA	305	0	$ -
				General Costs Subtotal	$ 1,153,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	7,200	130	$ 936,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth XX feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	10,200	40	$ 408,000
8	Construct 6-inch Diameter PVC Force Main	LF	67,600	35	$ 2,366,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 4,340,000
10	Special case - grinder pump stations	EA	80	20,000	$ 1,600,000
11	Overhead and Profit (15%)				$ 823,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 549,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 82,400
	TOTAL EOPCC				**$ 8,549,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AN

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	67,000	100	$ 6,700,000
2	Sod[3]	SY	6,600	7	$ 46,200
3	Abandon Septic Tanks	EA	299	1000	$ 299,000
4	On-Lot Connections	EA	299	0	$ -
				General Costs Subtotal	$ 7,046,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	150	9000	$ 1,350,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	66,200	150	$ 9,930,000
	PVC SDR 26				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,100	40	$ 524,000
8	Construct 6-inch Diameter PVC Force Main	LF	56,300	35	$ 1,970,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 14,675,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 3,258,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,172,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 325,900
	TOTAL EOPCC				**$ 27,478,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AO

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	38,000	100	$ 3,800,000
2	Sod[3]	SY	4,600	7	$ 32,200
3	Abandon Septic Tanks	EA	205	1000	$ 205,000
4	On-Lot Connections	EA	205	0	$ -
				General Costs Subtotal	$ 4,038,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	90	9000	$ 810,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	37,600	130	$ 4,888,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth XX feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,600	40	$ 344,000
8	Construct 6-inch Diameter PVC Force Main	LF	36,200	35	$ 1,267,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 7,759,000
10	Special case - grinder pump stations	EA	71	20,000	$ 1,420,000
11	Overhead and Profit (15%)				$ 1,769,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,179,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 177,000
	TOTAL EOPCC				**$ 16,344,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AP

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	35,000	100	$ 3,500,000
2	Sod[3]	SY	2,500	7	$ 17,500
3	Abandon Septic Tanks	EA	110	1000	$ 110,000
4	On-Lot Connections	EA	110	0	$ -
				General Costs Subtotal	$ 3,628,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	80	9000	$ 720,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	34,500	130	$ 4,485,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth XX feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,000	40	$ 240,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 5,895,000
10	Special case - grinder pump stations	EA	50	20,000	$ 1,000,000
11	Overhead and Profit (15%)				$ 1,428,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 952,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 142,900
	TOTAL EOPCC				**$ 13,047,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AQ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	179,000	100	$ 17,900,000
2	Sod[3]	SY	33,900	7	$ 237,300
3	Abandon Septic Tanks	EA	1,540	1000	$ 1,540,000
4	On-Lot Connections	EA	1540	0	$ -
				General Costs Subtotal	$ 19,678,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	400	9000	$ 3,600,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	179,000	130	$ 23,270,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 18 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	73,600	40	$ 2,944,000
8	Construct 6-inch Diameter PVC Force Main	LF	24,100	35	$ 843,500
9	Construct Lift Station	LS	7	450000	$ 3,150,000
				Gravity System Subtotal	$ 33,808,000
10	Special case - grinder pump stations	EA	50	20,000	$ 1,000,000
11	Overhead and Profit (15%)				$ 8,022,900
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 5,348,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 802,300
	TOTAL EOPCC				**$ 68,660,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AR

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	45,000	100	$ 4,500,000
2	Sod[3]	SY	8,500	7	$ 59,500
3	Abandon Septic Tanks	EA	383	1000	$ 383,000
4	On-Lot Connections	EA	383	0	$ -
				General Costs Subtotal	$ 4,943,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	100	9000	$ 900,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	44,200	150	$ 6,630,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	17,100	40	$ 684,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,300	35	$ 290,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 9,405,000
10	Special case - grinder pump stations	EA	7	20,000	$ 140,000
11	Overhead and Profit (15%)				$ 2,152,200
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,434,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 215,300
	TOTAL EOPCC				**$ 18,291,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AS

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	31,000	100	$ 3,100,000
2	Sod[3]	SY	9,700	7	$ 67,900
3	Abandon Septic Tanks	EA	440	1000	$ 440,000
4	On-Lot Connections	EA	440	0	$ -
				General Costs Subtotal	$ 3,608,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	12,200	130	$ 1,586,000
	10-inch diameter	LF	18,200	150	$ 2,730,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,800	40	$ 552,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,500	35	$ 157,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 6,556,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,524,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,016,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 152,500
	TOTAL EOPCC				**$ 12,858,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AT

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	86,000	100	$ 8,600,000
2	Sod[3]	SY	10,000	7	$ 70,000
3	Abandon Septic Tanks	EA	451	1000	$ 451,000
4	On-Lot Connections	EA	451	0	$ -
				General Costs Subtotal	$ 9,121,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	190	9000	$ 1,710,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	64,200	130	$ 8,346,000
	10-inch diameter	LF	21,400	150	$ 3,210,000
	PVC SDR 26				
	Maximum depth 18 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	41,100	40	$ 1,644,000
8	Construct 6-inch Diameter PVC Force Main	LF	800	35	$ 28,000
9	Construct Lift Station	LS	5	450000	$ 2,250,000
				Gravity System Subtotal	$ 17,188,000
10	Special case - grinder pump stations	EA	342	20,000	$ 6,840,000
11	Overhead and Profit (15%)				$ 3,946,350
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,630,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 394,700
	TOTAL EOPCC				**$ 40,121,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AU

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	5,000	100	$ 500,000
2	Sod[3]	SY	1,600	7	$ 11,200
3	Abandon Septic Tanks	EA	72	1000	$ 72,000
4	On-Lot Connections	EA	72	0	$ -
				General Costs Subtotal	$ 584,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	3,600	130	$ 468,000
	10-inch diameter	LF	1,200	150	$ 180,000
	PVC SDR 26				
	Maximum depth 19 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,000	40	$ 120,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,500	35	$ 157,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,556,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 321,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 214,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 32,100
	TOTAL EOPCC				**$ 2,708,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AV

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	29,000	100	$ 2,900,000
2	Sod[3]	SY	4,300	7	$ 30,100
3	Abandon Septic Tanks	EA	194	1000	$ 194,000
4	On-Lot Connections	EA	194	0	$ -
				General Costs Subtotal	$ 3,125,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	7,200	130	$ 936,000
	10-inch diameter	LF	21,500	150	$ 3,225,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,600	40	$ 264,000
8	Construct 6-inch Diameter PVC Force Main	LF	100	35	$ 3,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 5,509,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,295,100
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 863,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 129,600
	TOTAL EOPCC				**$ 10,923,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AW

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	7,000	100	$ 700,000
2	Sod[3]	SY	6,000	7	$ 42,000
3	Abandon Septic Tanks	EA	271	1000	$ 271,000
4	On-Lot Connections	EA	271	0	$ -
				General Costs Subtotal	$ 1,013,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	2,500	130	$ 325,000
	10-inch diameter	LF	3,700	150	$ 555,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	9,000	40	$ 360,000
8	Construct 6-inch Diameter PVC Force Main	LF	1,600	35	$ 56,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 2,376,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 508,350
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 338,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 50,900
	TOTAL EOPCC				**$ 4,288,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AX

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	23,000	100	$ 2,300,000
2	Sod[3]	SY	2,700	7	$ 18,900
3	Abandon Septic Tanks	EA	121	1000	$ 121,000
4	On-Lot Connections	EA	121	0	$ -
				General Costs Subtotal	$ 2,440,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	50	9000	$ 450,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	16,600	130	$ 2,158,000
	10-inch diameter	LF	5,600	150	$ 840,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	7,200	40	$ 288,000
8	Construct 6-inch Diameter PVC Force Main	LF	9,100	35	$ 318,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 4,505,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,041,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 694,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 104,200
	TOTAL EOPCC				**$ 8,786,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AY

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	7,000	100	$ 700,000
2	Sod[3]	SY	2,100	7	$ 14,700
3	Abandon Septic Tanks	EA	94	1000	$ 94,000
4	On-Lot Connections	EA	94	0	$ -
				General Costs Subtotal	$ 809,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	6,300	130	$ 819,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 11 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,400	40	$ 136,000
8	Construct 6-inch Diameter PVC Force Main	LF	1,900	35	$ 66,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,652,000
10	Special case - grinder pump stations	EA	12	20,000	$ 240,000
11	Overhead and Profit (15%)				$ 369,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 246,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 37,000
	TOTAL EOPCC				**$ 3,354,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA AZ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	26,000	100	$ 2,600,000
2	Sod[3]	SY	5,000	7	$ 35,000
3	Abandon Septic Tanks	EA	226	1000	$ 226,000
4	On-Lot Connections	EA	226	0	$ -
				General Costs Subtotal	$ 2,861,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	25,200	130	$ 3,276,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,700	40	$ 348,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,800	35	$ 168,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 4,782,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,146,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 764,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 114,700
	TOTAL EOPCC				**$ 9,669,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BA

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	54,000	100	$ 5,400,000
2	Sod[3]	SY	16,100	7	$ 112,700
3	Abandon Septic Tanks	EA	729	1000	$ 729,000
4	On-Lot Connections	EA	729	0	$ -
				General Costs Subtotal	$ 6,242,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	120	9000	$ 1,080,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	54,000	150	$ 8,100,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	23,400	40	$ 936,000
8	Construct 6-inch Diameter PVC Force Main	LF	6,000	35	$ 210,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 11,226,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,620,200
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,746,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 262,100
	TOTAL EOPCC				**$ 22,098,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

PPA BB

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	24,000	100	$ 2,400,000
2	Sod[3]	SY	18,600	7	$ 130,200
3	Abandon Septic Tanks	EA	842	1000	$ 842,000
4	On-Lot Connections	EA	842	0	$ -
				General Costs Subtotal	$ 3,373,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	23,400	130	$ 3,042,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 12 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	27,000	40	$ 1,080,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,200	35	$ 287,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 6,299,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,450,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 967,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 145,100
	TOTAL EOPCC				**$ 12,236,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BC

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	108,000	100	$ 10,800,000
2	Sod[3]	SY	29,600	7	$ 207,200
3	Abandon Septic Tanks	EA	1,344	1000	$ 1,344,000
4	On-Lot Connections	EA	1344	0	$ -
				General Costs Subtotal	$ 12,352,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	240	9000	$ 2,160,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	21,600	130	$ 2,808,000
	10-inch diameter	LF	86,200	150	$ 12,930,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	45,800	40	$ 1,832,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,000	35	$ 420,000
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 21,950,000
10	Special case - grinder pump stations	EA	6	20,000	$ 120,000
11	Overhead and Profit (15%)				$ 5,145,300
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 3,430,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 514,600
	TOTAL EOPCC				**$ 43,513,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BD

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	361,000	100	$ 36,100,000
2	Sod[3]	SY	65,900	7	$ 461,300
3	Abandon Septic Tanks	EA	2,993	1000	$ 2,993,000
4	On-Lot Connections	EA	2993	0	$ -
				General Costs Subtotal	$ 39,555,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	800	9000	$ 7,200,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	360,200	130	$ 46,826,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	142,100	40	$ 5,684,000
8	Construct 6-inch Diameter PVC Force Main	LF	52,000	35	$ 1,820,000
9	Construct Lift Station	LS	14	450000	$ 6,300,000
				Gravity System Subtotal	$ 67,830,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 16,107,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 10,738,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,610,800
	TOTAL EOPCC				**$ 135,843,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BE

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	300	7	$ 2,100
3	Abandon Septic Tanks	EA	11	1000	$ 11,000
4	On-Lot Connections	EA	11	0	$ -
				General Costs Subtotal	$ 14,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 450,000
10	Special case - grinder pump stations	EA	56	20,000	$ 1,120,000
11	Overhead and Profit (15%)				$ 69,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 46,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 7,000
	TOTAL EOPCC				**$ 1,707,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BF

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	104,000	100	$ 10,400,000
2	Sod[3]	SY	109,100	7	$ 763,700
3	Abandon Septic Tanks	EA	4,955	1000	$ 4,955,000
4	On-Lot Connections	EA	4955	0	$ -
				General Costs Subtotal	$ 16,119,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	230	9000	$ 2,070,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	78,000	130	$ 10,140,000
	10-inch diameter	LF	26,000	150	$ 3,900,000
	PVC SDR 26				
	Maximum depth 39 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	690,100	40	$ 27,604,000
8	Construct 6-inch Diameter PVC Force Main	LF	260,000	35	$ 9,100,000
9	Construct Lift Station	LS	66	450000	$ 29,700,000
				Gravity System Subtotal	$ 82,514,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 14,794,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 9,863,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,479,500
	TOTAL EOPCC				**$ 124,771,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BG

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	98,000	100	$ 9,800,000
2	Sod[3]	SY	5,900	7	$ 41,300
3	Abandon Septic Tanks	EA	266	1000	$ 266,000
4	On-Lot Connections	EA	266	0	$ -
				General Costs Subtotal	$ 10,108,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	220	9000	$ 1,980,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	73,400	130	$ 9,542,000
	10-inch diameter	LF	24,500	150	$ 3,675,000
	PVC SDR 26				
	Maximum depth 39 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	15,400	40	$ 616,000
8	Construct 6-inch Diameter PVC Force Main	LF	59,300	35	$ 2,075,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 18,789,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 4,334,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,889,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 433,500
	TOTAL EOPCC				**$ 36,555,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BH

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	132,000	100	$ 13,200,000
2	Sod[3]	SY	11,300	7	$ 79,100
3	Abandon Septic Tanks	EA	511	1000	$ 511,000
4	On-Lot Connections	EA	511	0	$ -
				General Costs Subtotal	$ 13,791,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	290	9000	$ 2,610,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	98,600	130	$ 12,818,000
	10-inch diameter	LF	32,900	150	$ 4,935,000
	PVC SDR 26				
	Maximum depth 25 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	44,000	40	$ 1,760,000
8	Construct 6-inch Diameter PVC Force Main	LF	70,800	35	$ 2,478,000
9	Construct Lift Station	LS	6	450000	$ 2,700,000
				Gravity System Subtotal	$ 27,301,000
10	Special case - grinder pump stations	EA	35	20,000	$ 700,000
11	Overhead and Profit (15%)				$ 6,163,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 4,109,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 616,400
	TOTAL EOPCC				**$ 52,682,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BI

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	29,000	100	$ 2,900,000
2	Sod[3]	SY	11,200	7	$ 78,400
3	Abandon Septic Tanks	EA	505	1000	$ 505,000
4	On-Lot Connections	EA	505	0	$ -
				General Costs Subtotal	$ 3,484,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	7,100	130	$ 923,000
	10-inch diameter	LF	21,200	150	$ 3,180,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,700	40	$ 268,000
8	Construct 6-inch Diameter PVC Force Main	LF	39,200	35	$ 1,372,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 7,273,000
10	Special case - grinder pump stations	EA	450.91	20,000	$ 9,018,200
11	Overhead and Profit (15%)				$ 1,613,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,075,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 161,400
	TOTAL EOPCC				**$ 22,626,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BJ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	2,600	7	$ 18,200
3	Abandon Septic Tanks	EA	114	1000	$ 114,000
4	On-Lot Connections	EA	114	0	$ -
				General Costs Subtotal	$ 133,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 25 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	32,100	35	$ 1,123,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,574,000
10	Special case - grinder pump stations	EA	153	20,000	$ 3,060,000
11	Overhead and Profit (15%)				$ 256,050
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 170,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 25,700
	TOTAL EOPCC				**$ 5,220,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BK

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	67,000	100	$ 6,700,000
2	Sod[3]	SY	15,700	7	$ 109,900
3	Abandon Septic Tanks	EA	712	1000	$ 712,000
4	On-Lot Connections	EA	712	0	$ -
				General Costs Subtotal	$ 7,522,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	150	9000	$ 1,350,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	16,600	130	$ 2,158,000
	10-inch diameter	LF	49,600	150	$ 7,440,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	9,500	40	$ 380,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,700	35	$ 304,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 12,533,000
10	Special case - grinder pump stations	EA	642.53	20,000	$ 12,850,600
11	Overhead and Profit (15%)				$ 3,008,250
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,005,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 300,900
	TOTAL EOPCC				**$ 38,221,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BL

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	87,000	100	$ 8,700,000
2	Sod[3]	SY	3,000	7	$ 21,000
3	Abandon Septic Tanks	EA	132	1000	$ 132,000
4	On-Lot Connections	EA	132	0	$ -
				General Costs Subtotal	$ 8,853,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	190	9000	$ 1,710,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	64,700	130	$ 8,411,000
	10-inch diameter	LF	21,600	150	$ 3,240,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	10,300	40	$ 412,000
8	Construct 6-inch Diameter PVC Force Main	LF	11,300	35	$ 395,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 15,519,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 3,655,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,437,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 365,600
	TOTAL EOPCC				**$ 30,831,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BM

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	135,000	100	$ 13,500,000
2	Sod[3]	SY	1,300	7	$ 9,100
3	Abandon Septic Tanks	EA	57	1000	$ 57,000
4	On-Lot Connections	EA	57	0	$ -
				General Costs Subtotal	$ 13,567,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	300	9000	$ 2,700,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	135,000	130	$ 17,550,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 12 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,800	40	$ 352,000
8	Construct 6-inch Diameter PVC Force Main	LF	5,500	35	$ 192,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 21,245,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 5,221,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 3,481,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 522,200
	TOTAL EOPCC				**$ 44,038,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BN

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	47,000	100	$ 4,700,000
2	Sod[3]	SY	8,400	7	$ 58,800
3	Abandon Septic Tanks	EA	378	1000	$ 378,000
4	On-Lot Connections	EA	378	0	$ -
				General Costs Subtotal	$ 5,137,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	110	9000	$ 990,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	23,400	130	$ 3,042,000
	10-inch diameter	LF	23,400	150	$ 3,510,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	17,200	40	$ 688,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,200	35	$ 147,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 9,277,000
10	Special case - grinder pump stations	EA	30	20,000	$ 600,000
11	Overhead and Profit (15%)				$ 2,162,100
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,441,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 216,300
	TOTAL EOPCC				**$ 18,834,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BO

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	8,000	100	$ 800,000
2	Sod[3]	SY	2,800	7	$ 19,600
3	Abandon Septic Tanks	EA	125	1000	$ 125,000
4	On-Lot Connections	EA	125	0	$ -
				General Costs Subtotal	$ 945,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	5,800	130	$ 754,000
	10-inch diameter	LF	2,000	150	$ 300,000
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,900	40	$ 156,000
8	Construct 6-inch Diameter PVC Force Main	LF	21,100	35	$ 738,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 3,479,000
10	Special case - grinder pump stations	EA	14	20,000	$ 280,000
11	Overhead and Profit (15%)				$ 663,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 442,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 66,400
	TOTAL EOPCC				**$ 5,877,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BP

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	18,000	100	$ 1,800,000
2	Sod[3]	SY	4,700	7	$ 32,900
3	Abandon Septic Tanks	EA	211	1000	$ 211,000
4	On-Lot Connections	EA	211	0	$ -
				General Costs Subtotal	$ 2,044,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	17,600	130	$ 2,288,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,900	40	$ 276,000
8	Construct 6-inch Diameter PVC Force Main	LF	7,600	35	$ 266,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 4,090,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 920,100
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 613,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 92,100
	TOTAL EOPCC				**$ 7,760,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BQ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	18,000	100	$ 1,800,000
2	Sod[3]	SY	4,500	7	$ 31,500
3	Abandon Septic Tanks	EA	203	1000	$ 203,000
4	On-Lot Connections	EA	203	0	$ -
				General Costs Subtotal	$ 2,035,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	8,700	130	$ 1,131,000
	10-inch diameter	LF	8,700	150	$ 1,305,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,900	40	$ 276,000
8	Construct 6-inch Diameter PVC Force Main	LF	6,300	35	$ 220,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 3,743,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 866,700
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 577,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 86,700
	TOTAL EOPCC				**$ 7,310,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BR

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	36,000	100	$ 3,600,000
2	Sod[3]	SY	10,100	7	$ 70,700
3	Abandon Septic Tanks	EA	459	1000	$ 459,000
4	On-Lot Connections	EA	459	0	$ -
				General Costs Subtotal	$ 4,130,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	80	9000	$ 720,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	26,500	130	$ 3,445,000
	10-inch diameter	LF	8,900	150	$ 1,335,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	15,300	40	$ 612,000
8	Construct 6-inch Diameter PVC Force Main	LF	18,300	35	$ 640,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 8,103,000
10	Special case - grinder pump stations	EA	4	20,000	$ 80,000
11	Overhead and Profit (15%)				$ 1,834,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,223,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 183,500
	TOTAL EOPCC				**$ 15,555,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BS

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	13,000	100	$ 1,300,000
2	Sod[3]	SY	3,800	7	$ 26,600
3	Abandon Septic Tanks	EA	172	1000	$ 172,000
4	On-Lot Connections	EA	172	0	$ -
				General Costs Subtotal	$ 1,499,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	9,700	130	$ 1,261,000
	10-inch diameter	LF	3,300	150	$ 495,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,800	40	$ 272,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,800	35	$ 448,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 3,646,000
10	Special case - grinder pump stations	EA	4	20,000	$ 80,000
11	Overhead and Profit (15%)				$ 771,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 514,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 77,200
	TOTAL EOPCC				**$ 6,589,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BT

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	6,000	100	$ 600,000
2	Sod[3]	SY	1,900	7	$ 13,300
3	Abandon Septic Tanks	EA	84	1000	$ 84,000
4	On-Lot Connections	EA	84	0	$ -
				General Costs Subtotal	$ 698,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	5,300	130	$ 689,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 10 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,100	40	$ 124,000
8	Construct 6-inch Diameter PVC Force Main	LF	2,200	35	$ 77,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,520,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 332,700
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 221,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 33,300
	TOTAL EOPCC				**$ 2,806,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BU

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	3,000	100	$ 300,000
2	Sod[3]	SY	1,100	7	$ 7,700
3	Abandon Septic Tanks	EA	49	1000	$ 49,000
4	On-Lot Connections	EA	49	0	$ -
				General Costs Subtotal	$ 357,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	12	9000	$ 108,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	3,000	130	$ 390,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 10 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	1,800	40	$ 72,000
8	Construct 6-inch Diameter PVC Force Main	LF	2,400	35	$ 84,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,104,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 219,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 146,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 22,000
	TOTAL EOPCC				**$ 1,849,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BV

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	26,000	100	$ 2,600,000
2	Sod[3]	SY	6,800	7	$ 47,600
3	Abandon Septic Tanks	EA	307	1000	$ 307,000
4	On-Lot Connections	EA	307	0	$ -
				General Costs Subtotal	$ 2,955,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	25,200	130	$ 3,276,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 12 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	10,400	40	$ 416,000
8	Construct 6-inch Diameter PVC Force Main	LF	6,200	35	$ 217,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 5,349,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,245,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 830,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 124,600
	TOTAL EOPCC				**$ 10,505,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BW

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	65,000	100	$ 6,500,000
2	Sod[3]	SY	18,300	7	$ 128,100
3	Abandon Septic Tanks	EA	829	1000	$ 829,000
4	On-Lot Connections	EA	829	0	$ -
				General Costs Subtotal	$ 7,458,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	150	9000	$ 1,350,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	32,300	130	$ 4,199,000
	10-inch diameter	LF	32,300	150	$ 4,845,000
	PVC SDR 26				
	Maximum depth 13 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	26,400	40	$ 1,056,000
8	Construct 6-inch Diameter PVC Force Main	LF	10,200	35	$ 357,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 13,157,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 3,092,250
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,061,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 309,300
	TOTAL EOPCC				**$ 26,079,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BX

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	3,000	100	$ 300,000
2	Sod[3]	SY	900	7	$ 6,300
3	Abandon Septic Tanks	EA	40	1000	$ 40,000
4	On-Lot Connections	EA	40	0	$ -
				General Costs Subtotal	$ 347,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	10	9000	$ 90,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	2,700	130	$ 351,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 10 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	1,300	40	$ 52,000
8	Construct 6-inch Diameter PVC Force Main	LF	9,400	35	$ 329,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,272,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 242,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 161,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 24,300
	TOTAL EOPCC				**$ 2,049,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BY

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	27,000	100	$ 2,700,000
2	Sod[3]	SY	4,600	7	$ 32,200
3	Abandon Septic Tanks	EA	206	1000	$ 206,000
4	On-Lot Connections	EA	206	0	$ -
				General Costs Subtotal	$ 2,939,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	20,300	130	$ 2,639,000
	10-inch diameter	LF	6,800	150	$ 1,020,000
	PVC SDR 26				
	Maximum depth 13 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,400	40	$ 336,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 4,985,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,188,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 792,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 118,900
	TOTAL EOPCC				**$ 10,024,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA BZ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	15,000	100	$ 1,500,000
2	Sod[3]	SY	4,800	7	$ 33,600
3	Abandon Septic Tanks	EA	214	1000	$ 214,000
4	On-Lot Connections	EA	214	0	$ -
				General Costs Subtotal	$ 1,748,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	7,200	130	$ 936,000
	10-inch diameter	LF	7,200	150	$ 1,080,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	7,300	40	$ 292,000
8	Construct 6-inch Diameter PVC Force Main	LF	5,000	35	$ 175,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 3,293,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 756,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 504,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 75,700
	TOTAL EOPCC				**$ 6,377,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CA

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	8,000	100	$ 800,000
2	Sod[3]	SY	3,000	7	$ 21,000
3	Abandon Septic Tanks	EA	135	1000	$ 135,000
4	On-Lot Connections	EA	135	0	$ -
				General Costs Subtotal	$ 956,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	7,900	130	$ 1,027,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	4,800	40	$ 192,000
8	Construct 6-inch Diameter PVC Force Main	LF	5,000	35	$ 175,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 2,474,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 514,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 343,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 51,500
	TOTAL EOPCC				**$ 4,339,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CB

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	27,000	100	$ 2,700,000
2	Sod[3]	SY	8,800	7	$ 61,600
3	Abandon Septic Tanks	EA	398	1000	$ 398,000
4	On-Lot Connections	EA	398	0	$ -
				General Costs Subtotal	$ 3,160,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	20,200	130	$ 2,626,000
	10-inch diameter	LF	6,800	150	$ 1,020,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	12,800	40	$ 512,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,300	35	$ 290,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 6,339,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,424,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 949,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 142,500
	TOTAL EOPCC				**$ 12,017,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CC

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	6,000	100	$ 600,000
2	Sod[3]	SY	2,200	7	$ 15,400
3	Abandon Septic Tanks	EA	96	1000	$ 96,000
4	On-Lot Connections	EA	96	0	$ -
				General Costs Subtotal	$ 712,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	6,000	130	$ 780,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 13 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,200	40	$ 128,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,538,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 337,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 225,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 33,800
	TOTAL EOPCC				**$ 2,847,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CD

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	74,000	100	$ 7,400,000
2	Sod[3]	SY	9,600	7	$ 67,200
3	Abandon Septic Tanks	EA	434	1000	$ 434,000
4	On-Lot Connections	EA	434	0	$ -
				General Costs Subtotal	$ 7,902,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	170	9000	$ 1,530,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	36,700	130	$ 4,771,000
	10-inch diameter	LF	36,700	150	$ 5,505,000
	PVC SDR 26				
	Maximum depth 45 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,100	40	$ 524,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 13,680,000
10	Special case - grinder pump stations	EA	213.51	20,000	$ 4,270,200
11	Overhead and Profit (15%)				$ 3,237,300
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,158,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 323,800
	TOTAL EOPCC				**$ 31,572,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CE

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	59,000	100	$ 5,900,000
2	Sod[3]	SY	10,500	7	$ 73,500
3	Abandon Septic Tanks	EA	475	1000	$ 475,000
4	On-Lot Connections	EA	475	0	$ -
				General Costs Subtotal	$ 6,449,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	130	9000	$ 1,170,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	29,500	130	$ 3,835,000
	10-inch diameter	LF	29,500	150	$ 4,425,000
	PVC SDR 26				
	Maximum depth 28 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	20,500	40	$ 820,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,000	35	$ 280,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 11,880,000
10	Special case - grinder pump stations	EA	12	20,000	$ 240,000
11	Overhead and Profit (15%)				$ 2,749,350
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,832,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 275,000
	TOTAL EOPCC				**$ 23,427,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CF

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	12,000	100	$ 1,200,000
2	Sod[3]	SY	3,700	7	$ 25,900
3	Abandon Septic Tanks	EA	167	1000	$ 167,000
4	On-Lot Connections	EA	167	0	$ -
				General Costs Subtotal	$ 1,393,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	5,800	130	$ 754,000
	10-inch diameter	LF	5,800	150	$ 870,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,300	40	$ 252,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,200	35	$ 147,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 3,193,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 687,900
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 458,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 68,800
	TOTAL EOPCC				**$ 5,802,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CG

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	124,000	100	$ 12,400,000
2	Sod[3]	SY	14,000	7	$ 98,000
3	Abandon Septic Tanks	EA	632	1000	$ 632,000
4	On-Lot Connections	EA	632	0	$ -
				General Costs Subtotal	$ 13,130,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	280	9000	$ 2,520,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	61,700	130	$ 8,021,000
	10-inch diameter	LF	61,700	150	$ 9,255,000
	PVC SDR 26				
	Maximum depth 19 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	20,500	40	$ 820,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,000	35	$ 280,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 22,246,000
10	Special case - grinder pump stations	EA	6	20,000	$ 120,000
11	Overhead and Profit (15%)				$ 5,306,400
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 3,537,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 530,700
	TOTAL EOPCC				**$ 44,871,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CH

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	50,000	100	$ 5,000,000
2	Sod[3]	SY	2,200	7	$ 15,400
3	Abandon Septic Tanks	EA	96	1000	$ 96,000
4	On-Lot Connections	EA	96	0	$ -
				General Costs Subtotal	$ 5,112,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	24,900	130	$ 3,237,000
	10-inch diameter	LF	24,900	150	$ 3,735,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,500	40	$ 140,000
8	Construct 6-inch Diameter PVC Force Main	LF	1,200	35	$ 42,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 7,784,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,934,400
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,289,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 193,500
	TOTAL EOPCC				**$ 16,314,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CI

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	12,000	100	$ 1,200,000
2	Sod[3]	SY	1,900	7	$ 13,300
3	Abandon Septic Tanks	EA	86	1000	$ 86,000
4	On-Lot Connections	EA	86	0	$ -
				General Costs Subtotal	$ 1,300,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	11,200	130	$ 1,456,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,200	40	$ 128,000
8	Construct 6-inch Diameter PVC Force Main	LF	100	35	$ 3,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,308,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 541,200
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 360,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 54,200
	TOTAL EOPCC				**$ 4,565,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CJ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	52,000	100	$ 5,200,000
2	Sod[3]	SY	13,700	7	$ 95,900
3	Abandon Septic Tanks	EA	622	1000	$ 622,000
4	On-Lot Connections	EA	622	0	$ -
				General Costs Subtotal	$ 5,918,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	120	9000	$ 1,080,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	25,800	130	$ 3,354,000
	10-inch diameter	LF	25,800	150	$ 3,870,000
	PVC SDR 26				
	Maximum depth 23 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	21,400	40	$ 856,000
8	Construct 6-inch Diameter PVC Force Main	LF	14,000	35	$ 490,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 11,000,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,537,700
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,691,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 253,800
	TOTAL EOPCC				**$ 21,402,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CK

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	6,000	100	$ 600,000
2	Sod[3]	SY	1,500	7	$ 10,500
3	Abandon Septic Tanks	EA	67	1000	$ 67,000
4	On-Lot Connections	EA	67	0	$ -
				General Costs Subtotal	$ 678,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	5,200	130	$ 676,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	2,200	40	$ 88,000
8	Construct 6-inch Diameter PVC Force Main	LF	600	35	$ 21,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,415,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 313,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 209,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 31,400
	TOTAL EOPCC				**$ 2,648,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CL

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	24,000	100	$ 2,400,000
2	Sod[3]	SY	5,400	7	$ 37,800
3	Abandon Septic Tanks	EA	244	1000	$ 244,000
4	On-Lot Connections	EA	244	0	$ -
				General Costs Subtotal	$ 2,682,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	23,600	130	$ 3,068,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,600	40	$ 344,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,400	35	$ 294,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 5,146,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,174,200
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 782,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 117,500
	TOTAL EOPCC				**$ 9,903,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CM

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	51,000	100	$ 5,100,000
2	Sod[3]	SY	15,000	7	$ 105,000
3	Abandon Septic Tanks	EA	678	1000	$ 678,000
4	On-Lot Connections	EA	678	0	$ -
				General Costs Subtotal	$ 5,883,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	120	9000	$ 1,080,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	25,100	130	$ 3,263,000
	10-inch diameter	LF	25,100	150	$ 3,765,000
	PVC SDR 26				
	Maximum depth 19 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	22,200	40	$ 888,000
8	Construct 6-inch Diameter PVC Force Main	LF	13,800	35	$ 483,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 10,829,000
10	Special case - grinder pump stations	EA	1	20,000	$ 20,000
11	Overhead and Profit (15%)				$ 2,506,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,671,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 250,700
	TOTAL EOPCC				**$ 21,161,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CN

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	16,000	100	$ 1,600,000
2	Sod[3]	SY	4,600	7	$ 32,200
3	Abandon Septic Tanks	EA	209	1000	$ 209,000
4	On-Lot Connections	EA	209	0	$ -
				General Costs Subtotal	$ 1,842,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	4,000	130	$ 520,000
	10-inch diameter	LF	11,900	150	$ 1,785,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	5,000	40	$ 200,000
8	Construct 6-inch Diameter PVC Force Main	LF	13,000	35	$ 455,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 3,770,000
10	Special case - grinder pump stations	EA	103	20,000	$ 2,060,000
11	Overhead and Profit (15%)				$ 841,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 561,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 84,200
	TOTAL EOPCC				**$ 9,160,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CO

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	4,000	100	$ 400,000
2	Sod[3]	SY	4,000	7	$ 28,000
3	Abandon Septic Tanks	EA	178	1000	$ 178,000
4	On-Lot Connections	EA	178	0	$ -
				General Costs Subtotal	$ 606,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	10	9000	$ 90,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	3,600	130	$ 468,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 38 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	1,000	40	$ 40,000
8	Construct 6-inch Diameter PVC Force Main	LF	15,000	35	$ 525,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,573,000
10	Special case - grinder pump stations	EA	178	20,000	$ 3,560,000
11	Overhead and Profit (15%)				$ 326,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 217,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 32,700
	TOTAL EOPCC				**$ 6,317,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CP

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	5,000	100	$ 500,000
2	Sod[3]	SY	1,700	7	$ 11,900
3	Abandon Septic Tanks	EA	73	1000	$ 73,000
4	On-Lot Connections	EA	73	0	$ -
				General Costs Subtotal	$ 585,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	10	9000	$ 90,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	4,400	130	$ 572,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 10 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	2,300	40	$ 92,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,500	35	$ 437,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,642,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 334,050
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 222,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 33,500
	TOTAL EOPCC				**$ 2,818,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CQ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	50,000	100	$ 5,000,000
2	Sod[3]	SY	12,800	7	$ 89,600
3	Abandon Septic Tanks	EA	581	1000	$ 581,000
4	On-Lot Connections	EA	581	0	$ -
				General Costs Subtotal	$ 5,671,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	110	9000	$ 990,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	12,400	130	$ 1,612,000
	10-inch diameter	LF	37,200	150	$ 5,580,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	21,600	40	$ 864,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,500	35	$ 437,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 10,384,000
10	Special case - grinder pump stations	EA	2	20,000	$ 40,000
11	Overhead and Profit (15%)				$ 2,408,250
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,605,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 240,900
	TOTAL EOPCC				**$ 20,350,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CR

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	9,000	100	$ 900,000
2	Sod[3]	SY	1,400	7	$ 9,800
3	Abandon Septic Tanks	EA	63	1000	$ 63,000
4	On-Lot Connections	EA	63	0	$ -
				General Costs Subtotal	$ 973,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	6,400	130	$ 832,000
	10-inch diameter	LF	2,200	150	$ 330,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	2,200	40	$ 88,000
8	Construct 6-inch Diameter PVC Force Main	LF	20,500	35	$ 717,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,598,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 535,650
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 357,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 53,600
	TOTAL EOPCC				**$ 4,518,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CS

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	11,000	100	$ 1,100,000
2	Sod[3]	SY	3,600	7	$ 25,200
3	Abandon Septic Tanks	EA	163	1000	$ 163,000
4	On-Lot Connections	EA	163	0	$ -
				General Costs Subtotal	$ 1,289,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	10,900	130	$ 1,417,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 11 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	5,700	40	$ 228,000
8	Construct 6-inch Diameter PVC Force Main	LF	3,900	35	$ 136,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,502,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 568,650
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 379,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 56,900
	TOTAL EOPCC				**$ 4,796,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

PPA CT

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	1,100	7	$ 7,700
3	Abandon Septic Tanks	EA	47	1000	$ 47,000
4	On-Lot Connections	EA	47	0	$ -
				General Costs Subtotal	$ 55,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	500	35	$ 17,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 468,000
10	Special case - grinder pump stations	EA	76	20,000	$ 1,520,000
11	Overhead and Profit (15%)				$ 78,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 52,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 7,900
	TOTAL EOPCC				**$ 2,182,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CU

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	4,000	100	$ 400,000
2	Sod[3]	SY	1,200	7	$ 8,400
3	Abandon Septic Tanks	EA	54	1000	$ 54,000
4	On-Lot Connections	EA	54	0	$ -
				General Costs Subtotal	$ 463,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	10	9000	$ 90,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	2,000	130	$ 260,000
	10-inch diameter	LF	2,000	150	$ 300,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	2,000	40	$ 80,000
8	Construct 6-inch Diameter PVC Force Main	LF	14,600	35	$ 511,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,691,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 323,100
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 215,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 32,400
	TOTAL EOPCC				**$ 2,725,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CV

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	172,000	100	$ 17,200,000
2	Sod[3]	SY	2,400	7	$ 16,800
3	Abandon Septic Tanks	EA	106	1000	$ 106,000
4	On-Lot Connections	EA	106	0	$ -
				General Costs Subtotal	$ 17,323,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	380	9000	$ 3,420,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	137,600	130	$ 17,888,000
	10-inch diameter	LF	34,400	150	$ 5,160,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	4,500	40	$ 180,000
8	Construct 6-inch Diameter PVC Force Main	LF	2,400	35	$ 84,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 27,182,000
10	Special case - grinder pump stations	EA	11	20,000	$ 220,000
11	Overhead and Profit (15%)				$ 6,675,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 4,450,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 667,600
	TOTAL EOPCC				**$ 56,519,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CW

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	9,000	100	$ 900,000
2	Sod[3]	SY	7,100	7	$ 49,700
3	Abandon Septic Tanks	EA	322	1000	$ 322,000
4	On-Lot Connections	EA	322	0	$ -
				General Costs Subtotal	$ 1,272,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	4,300	130	$ 559,000
	10-inch diameter	LF	4,300	150	$ 645,000
	PVC SDR 26				
	Maximum depth 18 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	28,200	40	$ 1,128,000
8	Construct 6-inch Diameter PVC Force Main	LF	10,000	35	$ 350,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 4,212,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 822,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 548,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 82,300
	TOTAL EOPCC				**$ 6,938,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CX

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	261,000	100	$ 26,100,000
2	Sod[3]	SY	36,700	7	$ 256,900
3	Abandon Septic Tanks	EA	1,666	1000	$ 1,666,000
4	On-Lot Connections	EA	1666	0	$ -
				General Costs Subtotal	$ 28,023,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	580	9000	$ 5,220,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	208,300	130	$ 27,079,000
	10-inch diameter	LF	52,100	150	$ 7,815,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	114,500	40	$ 4,580,000
8	Construct 6-inch Diameter PVC Force Main	LF	20,700	35	$ 724,500
9	Construct Lift Station	LS	6	450000	$ 2,700,000
				Gravity System Subtotal	$ 48,119,000
10	Special case - grinder pump stations	EA	11	20,000	$ 220,000
11	Overhead and Profit (15%)				$ 11,421,300
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 7,614,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,142,200
	TOTAL EOPCC				**$ 96,540,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CY

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	66,000	100	$ 6,600,000
2	Sod[3]	SY	6,100	7	$ 42,700
3	Abandon Septic Tanks	EA	273	1000	$ 273,000
4	On-Lot Connections	EA	273	0	$ -
				General Costs Subtotal	$ 6,916,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	150	9000	$ 1,350,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	65,300	130	$ 8,489,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 22 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	16,800	40	$ 672,000
8	Construct 6-inch Diameter PVC Force Main	LF	68,400	35	$ 2,394,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 13,805,000
10	Special case - grinder pump stations	EA	50	20,000	$ 1,000,000
11	Overhead and Profit (15%)				$ 3,108,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,072,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 310,900
	TOTAL EOPCC				**$ 27,213,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA CZ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	47,000	100	$ 4,700,000
2	Sod[3]	SY	7,800	7	$ 54,600
3	Abandon Septic Tanks	EA	354	1000	$ 354,000
4	On-Lot Connections	EA	354	0	$ -
				General Costs Subtotal	$ 5,109,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	110	9000	$ 990,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	23,100	130	$ 3,003,000
	10-inch diameter	LF	23,100	150	$ 3,465,000
	PVC SDR 26				
	Maximum depth 21 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,100	40	$ 524,000
8	Construct 6-inch Diameter PVC Force Main	LF	15,500	35	$ 542,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 9,875,000
10	Special case - grinder pump stations	EA	27	20,000	$ 540,000
11	Overhead and Profit (15%)				$ 2,247,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,498,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 224,800
	TOTAL EOPCC				**$ 19,495,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DA

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	11,000	100	$ 1,100,000
2	Sod[3]	SY	2,700	7	$ 18,900
3	Abandon Septic Tanks	EA	122	1000	$ 122,000
4	On-Lot Connections	EA	122	0	$ -
				General Costs Subtotal	$ 1,241,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	10,300	130	$ 1,339,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 12 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	4,500	40	$ 180,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,239,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 522,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 348,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 52,200
	TOTAL EOPCC				**$ 4,403,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DB

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	700	7	$ 4,900
3	Abandon Septic Tanks	EA	28	1000	$ 28,000
4	On-Lot Connections	EA	28	0	$ -
				General Costs Subtotal	$ 33,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 24 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 450,000
10	Special case - grinder pump stations	EA	74	20,000	$ 1,480,000
11	Overhead and Profit (15%)				$ 72,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 48,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 7,300
			TOTAL EOPCC		**$ 2,092,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DC

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	83,000	100	$ 8,300,000
2	Sod[3]	SY	20,500	7	$ 143,500
3	Abandon Septic Tanks	EA	929	1000	$ 929,000
4	On-Lot Connections	EA	929	0	$ -
				General Costs Subtotal	$ 9,373,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	190	9000	$ 1,710,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	41,200	130	$ 5,356,000
	10-inch diameter	LF	41,200	150	$ 6,180,000
	PVC SDR 26				
	Maximum depth 24 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	31,400	40	$ 1,256,000
8	Construct 6-inch Diameter PVC Force Main	LF	16,000	35	$ 560,000
9	Construct Lift Station	LS	5	450000	$ 2,250,000
				Gravity System Subtotal	$ 17,312,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 4,002,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,668,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 400,300
	TOTAL EOPCC				**$ 33,757,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DD

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	15,000	100	$ 1,500,000
2	Sod[3]	SY	4,100	7	$ 28,700
3	Abandon Septic Tanks	EA	182	1000	$ 182,000
4	On-Lot Connections	EA	182	0	$ -
				General Costs Subtotal	$ 1,711,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	14,700	130	$ 1,911,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 25 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,200	40	$ 248,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,969,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 702,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 468,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 70,200
	TOTAL EOPCC				**$ 5,921,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DE

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	30,000	100	$ 3,000,000
2	Sod[3]	SY	7,300	7	$ 51,100
3	Abandon Septic Tanks	EA	328	1000	$ 328,000
4	On-Lot Connections	EA	328	0	$ -
				General Costs Subtotal	$ 3,380,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	14,800	130	$ 1,924,000
	10-inch diameter	LF	14,800	150	$ 2,220,000
	PVC SDR 26				
	Maximum depth 17 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	12,300	40	$ 492,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,100	35	$ 143,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 6,310,000
10	Special case - grinder pump stations	EA	15	20,000	$ 300,000
11	Overhead and Profit (15%)				$ 1,453,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 969,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 145,400
	TOTAL EOPCC				**$ 12,558,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DF

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	10,000	100	$ 1,000,000
2	Sod[3]	SY	1,700	7	$ 11,900
3	Abandon Septic Tanks	EA	77	1000	$ 77,000
4	On-Lot Connections	EA	77	0	$ -
				General Costs Subtotal	$ 1,089,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	4,800	130	$ 624,000
	10-inch diameter	LF	4,800	150	$ 720,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	2,600	40	$ 104,000
8	Construct 6-inch Diameter PVC Force Main	LF	17,500	35	$ 612,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,781,000
10	Special case - grinder pump stations	EA	24	20,000	$ 480,000
11	Overhead and Profit (15%)				$ 652,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 435,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 58,100
	TOTAL EOPCC				**$ 5,496,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DG

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	5,000	100	$ 500,000
2	Sod[3]	SY	1,500	7	$ 10,500
3	Abandon Septic Tanks	EA	65	1000	$ 65,000
4	On-Lot Connections	EA	65	0	$ -
				General Costs Subtotal	$ 576,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	10	9000	$ 90,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	4,200	130	$ 546,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 9 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	2,100	40	$ 84,000
8	Construct 6-inch Diameter PVC Force Main	LF	200	35	$ 7,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,177,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 262,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 175,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 26,300
	TOTAL EOPCC				**$ 2,218,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DH

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	105,000	100	$ 10,500,000
2	Sod[3]	SY	24,400	7	$ 170,800
3	Abandon Septic Tanks	EA	1,108	1000	$ 1,108,000
4	On-Lot Connections	EA	1108	0	$ -
				General Costs Subtotal	$ 11,779,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	230	9000	$ 2,070,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	52,200	130	$ 6,786,000
	10-inch diameter	LF	52,200	150	$ 7,830,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	39,400	40	$ 1,576,000
8	Construct 6-inch Diameter PVC Force Main	LF	16,000	35	$ 560,000
9	Construct Lift Station	LS	5	450000	$ 2,250,000
				Gravity System Subtotal	$ 21,072,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 4,927,650
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 3,285,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 492,800
	TOTAL EOPCC				**$ 41,557,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DI

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	94,000	100	$ 9,400,000
2	Sod[3]	SY	26,100	7	$ 182,700
3	Abandon Septic Tanks	EA	1,185	1000	$ 1,185,000
4	On-Lot Connections	EA	1185	0	$ -
				General Costs Subtotal	$ 10,768,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	210	9000	$ 1,890,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	75,200	130	$ 9,776,000
	10-inch diameter	LF	18,800	150	$ 2,820,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	44,800	40	$ 1,792,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,000	35	$ 420,000
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 18,498,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 4,389,900
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,926,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 439,000
	TOTAL EOPCC				**$ 37,022,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DJ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	500	7	$ 3,500
3	Abandon Septic Tanks	EA	22	1000	$ 22,000
4	On-Lot Connections	EA	22	0	$ -
				General Costs Subtotal	$ 26,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	1,200	35	$ 42,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 492,000
10	Special case - grinder pump stations	EA	29	20,000	$ 580,000
11	Overhead and Profit (15%)				$ 77,700
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 51,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 7,800
	TOTAL EOPCC				**$ 1,236,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DK

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	308,000	100	$ 30,800,000
2	Sod[3]	SY	62,300	7	$ 436,100
3	Abandon Septic Tanks	EA	2,831	1000	$ 2,831,000
4	On-Lot Connections	EA	2831	0	$ -
				General Costs Subtotal	$ 34,068,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	680	9000	$ 6,120,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	307,900	130	$ 40,027,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 13 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	136,800	40	$ 5,472,000
8	Construct 6-inch Diameter PVC Force Main	LF	48,000	35	$ 1,680,000
9	Construct Lift Station	LS	13	450000	$ 5,850,000
				Gravity System Subtotal	$ 59,149,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 13,982,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 9,321,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,398,300
	TOTAL EOPCC				**$ 117,920,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

PPA DL

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	272,000	100	$ 27,200,000
2	Sod[3]	SY	41,000	7	$ 287,000
3	Abandon Septic Tanks	EA	1,861	1000	$ 1,861,000
4	On-Lot Connections	EA	1861	0	$ -
				General Costs Subtotal	$ 29,348,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	600	9000	$ 5,400,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	217,300	130	$ 28,249,000
	10-inch diameter	LF	54,400	150	$ 8,160,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	127,400	40	$ 5,096,000
8	Construct 6-inch Diameter PVC Force Main	LF	44,000	35	$ 1,540,000
9	Construct Lift Station	LS	12	450000	$ 5,400,000
				Gravity System Subtotal	$ 53,845,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 12,478,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 8,319,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,247,900
	TOTAL EOPCC				**$ 105,240,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DM

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	186,000	100	$ 18,600,000
2	Sod[3]	SY	21,900	7	$ 153,300
3	Abandon Septic Tanks	EA	993	1000	$ 993,000
4	On-Lot Connections	EA	993	0	$ -
				General Costs Subtotal	$ 19,747,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	410	9000	$ 3,690,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	186,000	130	$ 24,180,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 19 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	82,400	40	$ 3,296,000
8	Construct 6-inch Diameter PVC Force Main	LF	28,200	35	$ 987,000
9	Construct Lift Station	LS	8	450000	$ 3,600,000
				Gravity System Subtotal	$ 35,753,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 8,325,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 5,550,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 832,500
	TOTAL EOPCC				**$ 70,208,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DN

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	55,000	100	$ 5,500,000
2	Sod[3]	SY	7,700	7	$ 53,900
3	Abandon Septic Tanks	EA	347	1000	$ 347,000
4	On-Lot Connections	EA	347	0	$ -
				General Costs Subtotal	$ 5,901,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	130	9000	$ 1,170,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	27,400	130	$ 3,562,000
	10-inch diameter	LF	27,400	150	$ 4,110,000
	PVC SDR 26				
	Maximum depth 23 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,600	40	$ 544,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 10,736,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,495,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,663,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 249,600
	TOTAL EOPCC				**$ 21,046,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DO

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	85,000	100	$ 8,500,000
2	Sod[3]	SY	6,400	7	$ 44,800
3	Abandon Septic Tanks	EA	287	1000	$ 287,000
4	On-Lot Connections	EA	287	0	$ -
				General Costs Subtotal	$ 8,832,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	190	9000	$ 1,710,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	84,500	130	$ 10,985,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth XX feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	36,900	40	$ 1,476,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,000	35	$ 420,000
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 16,391,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 3,783,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,522,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 378,400
	TOTAL EOPCC				**$ 31,908,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DP

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	153,000	100	$ 15,300,000
2	Sod[3]	SY	4,100	7	$ 28,700
3	Abandon Septic Tanks	EA	184	1000	$ 184,000
4	On-Lot Connections	EA	184	0	$ -
				General Costs Subtotal	$ 15,513,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	340	9000	$ 3,060,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	152,200	130	$ 19,786,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 3 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	65,300	40	$ 2,612,000
8	Construct 6-inch Diameter PVC Force Main	LF	24,000	35	$ 840,000
9	Construct Lift Station	LS	7	450000	$ 3,150,000
				Gravity System Subtotal	$ 29,448,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 6,744,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 4,496,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 674,500
	TOTAL EOPCC				**$ 56,876,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DQ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	24,000	100	$ 2,400,000
2	Sod[3]	SY	1,800	7	$ 12,600
3	Abandon Septic Tanks	EA	80	1000	$ 80,000
4	On-Lot Connections	EA	80	0	$ -
				General Costs Subtotal	$ 2,493,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	17,500	130	$ 2,275,000
	10-inch diameter	LF	5,900	150	$ 885,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	10,700	40	$ 428,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 4,578,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,060,650
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 707,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 106,100
	TOTAL EOPCC				**$ 8,945,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DR

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	2,900	7	$ 20,300
3	Abandon Septic Tanks	EA	128	1000	$ 128,000
4	On-Lot Connections	EA	128	0	$ -
				General Costs Subtotal	$ 149,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	6,300	35	$ 220,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 671,000
10	Special case - grinder pump stations	EA	170	20,000	$ 3,400,000
11	Overhead and Profit (15%)				$ 123,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 82,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 12,300
	TOTAL EOPCC				**$ 4,438,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DS

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	8,000	100	$ 800,000
2	Sod[3]	SY	2,900	7	$ 20,300
3	Abandon Septic Tanks	EA	129	1000	$ 129,000
4	On-Lot Connections	EA	129	0	$ -
				General Costs Subtotal	$ 950,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	8,000	130	$ 1,040,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,700	40	$ 148,000
8	Construct 6-inch Diameter PVC Force Main	LF	2,800	35	$ 98,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,916,000
10	Special case - grinder pump stations	EA	15	20,000	$ 300,000
11	Overhead and Profit (15%)				$ 429,900
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 286,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 43,000
	TOTAL EOPCC				**$ 3,926,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DT

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	11,000	100	$ 1,100,000
2	Sod[3]	SY	2,600	7	$ 18,200
3	Abandon Septic Tanks	EA	118	1000	$ 118,000
4	On-Lot Connections	EA	118	0	$ -
				General Costs Subtotal	$ 1,237,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	10,700	130	$ 1,391,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 12 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	4,300	40	$ 172,000
8	Construct 6-inch Diameter PVC Force Main	LF	3,400	35	$ 119,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,402,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 545,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 363,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 54,600
	TOTAL EOPCC				**$ 4,604,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DU

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	16,000	100	$ 1,600,000
2	Sod[3]	SY	3,100	7	$ 21,700
3	Abandon Septic Tanks	EA	137	1000	$ 137,000
4	On-Lot Connections	EA	137	0	$ -
				General Costs Subtotal	$ 1,759,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	15,900	130	$ 2,067,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,400	40	$ 256,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 3,133,000
10	Special case - grinder pump stations	EA	20	20,000	$ 400,000
11	Overhead and Profit (15%)				$ 733,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 489,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 73,400
	TOTAL EOPCC				**$ 6,589,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DV

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	18,000	100	$ 1,800,000
2	Sod[3]	SY	400	7	$ 2,800
3	Abandon Septic Tanks	EA	14	1000	$ 14,000
4	On-Lot Connections	EA	14	0	$ -
				General Costs Subtotal	$ 1,817,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	12,900	130	$ 1,677,000
	10-inch diameter	LF	4,300	150	$ 645,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,100	40	$ 324,000
8	Construct 6-inch Diameter PVC Force Main	LF	14,000	35	$ 490,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 3,946,000
10	Special case - grinder pump stations	EA	2	20,000	$ 40,000
11	Overhead and Profit (15%)				$ 864,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 576,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 86,500
	TOTAL EOPCC				**$ 7,331,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DW

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	51,000	100	$ 5,100,000
2	Sod[3]	SY	12,300	7	$ 86,100
3	Abandon Septic Tanks	EA	555	1000	$ 555,000
4	On-Lot Connections	EA	555	0	$ -
				General Costs Subtotal	$ 5,742,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	120	9000	$ 1,080,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	25,200	130	$ 3,276,000
	10-inch diameter	LF	25,200	150	$ 3,780,000
	PVC SDR 26				
	Maximum depth 20 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	20,800	40	$ 832,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,100	35	$ 283,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 10,602,000
10	Special case - grinder pump stations	EA	7	20,000	$ 140,000
11	Overhead and Profit (15%)				$ 2,451,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,634,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 245,200
	TOTAL EOPCC				**$ 20,816,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DX

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	41,000	100	$ 4,100,000
2	Sod[3]	SY	10,800	7	$ 75,600
3	Abandon Septic Tanks	EA	490	1000	$ 490,000
4	On-Lot Connections	EA	490	0	$ -
				General Costs Subtotal	$ 4,666,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	90	9000	$ 810,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	40,600	150	$ 6,090,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	17,900	40	$ 716,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,600	35	$ 161,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 8,677,000
10	Special case - grinder pump stations	EA	4	20,000	$ 80,000
11	Overhead and Profit (15%)				$ 2,001,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,334,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 200,200
	TOTAL EOPCC				**$ 16,959,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DY

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	35,000	100	$ 3,500,000
2	Sod[3]	SY	6,500	7	$ 45,500
3	Abandon Septic Tanks	EA	294	1000	$ 294,000
4	On-Lot Connections	EA	294	0	$ -
				General Costs Subtotal	$ 3,840,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	80	9000	$ 720,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	25,700	130	$ 3,341,000
	10-inch diameter	LF	8,600	150	$ 1,290,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	14,300	40	$ 572,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,400	35	$ 294,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 7,117,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,643,550
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,095,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 164,400
	TOTAL EOPCC				**$ 13,861,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA DZ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	7,000	100	$ 700,000
2	Sod[3]	SY	2,000	7	$ 14,000
3	Abandon Septic Tanks	EA	89	1000	$ 89,000
4	On-Lot Connections	EA	89	0	$ -
				General Costs Subtotal	$ 803,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	20	9000	$ 180,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	7,000	130	$ 910,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 12 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	3,700	40	$ 148,000
8	Construct 6-inch Diameter PVC Force Main	LF	3,200	35	$ 112,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,800,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 390,450
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 260,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 39,100
	TOTAL EOPCC				**$ 3,293,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EA

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	12,000	100	$ 1,200,000
2	Sod[3]	SY	1,000	7	$ 7,000
3	Abandon Septic Tanks	EA	45	1000	$ 45,000
4	On-Lot Connections	EA	45	0	$ -
				General Costs Subtotal	$ 1,252,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	8,400	130	$ 1,092,000
	10-inch diameter	LF	2,800	150	$ 420,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,400	40	$ 256,000
8	Construct 6-inch Diameter PVC Force Main	LF	200	35	$ 7,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,495,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 562,050
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 374,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 56,300
	TOTAL EOPCC				**$ 4,741,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EB

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	2,800	7	$ 19,600
3	Abandon Septic Tanks	EA	125	1000	$ 125,000
4	On-Lot Connections	EA	125	0	$ -
				General Costs Subtotal	$ 145,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	4,100	35	$ 143,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 594,000
10	Special case - grinder pump stations	EA	160	20,000	$ 3,200,000
11	Overhead and Profit (15%)				$ 110,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 73,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 11,100
	TOTAL EOPCC				**$ 4,135,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EC

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	12,000	100	$ 1,200,000
2	Sod[3]	SY	3,600	7	$ 25,200
3	Abandon Septic Tanks	EA	162	1000	$ 162,000
4	On-Lot Connections	EA	162	0	$ -
				General Costs Subtotal	$ 1,388,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	30	9000	$ 270,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	5,600	130	$ 728,000
	10-inch diameter	LF	5,600	150	$ 840,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	5,700	40	$ 228,000
8	Construct 6-inch Diameter PVC Force Main	LF	100	35	$ 3,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 2,520,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 586,200
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 390,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 58,700
	TOTAL EOPCC				**$ 4,944,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA ED

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	22,000	100	$ 2,200,000
2	Sod[3]	SY	5,200	7	$ 36,400
3	Abandon Septic Tanks	EA	232	1000	$ 232,000
4	On-Lot Connections	EA	232	0	$ -
				General Costs Subtotal	$ 2,469,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	50	9000	$ 450,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	15,800	130	$ 2,054,000
	10-inch diameter	LF	5,300	150	$ 795,000
	PVC SDR 26				
	Maximum depth 16 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	10,200	40	$ 408,000
8	Construct 6-inch Diameter PVC Force Main	LF	7,900	35	$ 276,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 4,884,000
10	Special case - grinder pump stations	EA	10	20,000	$ 200,000
11	Overhead and Profit (15%)				$ 1,102,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 735,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 110,300
	TOTAL EOPCC				**$ 9,502,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EE

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	81,000	100	$ 8,100,000
2	Sod[3]	SY	14,000	7	$ 98,000
3	Abandon Septic Tanks	EA	634	1000	$ 634,000
4	On-Lot Connections	EA	634	0	$ -
				General Costs Subtotal	$ 8,832,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	180	9000	$ 1,620,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	64,400	130	$ 8,372,000
	10-inch diameter	LF	16,100	150	$ 2,415,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	33,200	40	$ 1,328,000
8	Construct 6-inch Diameter PVC Force Main	LF	9,800	35	$ 343,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 15,428,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 3,639,000
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,426,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 363,900
	TOTAL EOPCC				**$ 30,689,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EF

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	31,000	100	$ 3,100,000
2	Sod[3]	SY	7,800	7	$ 54,600
3	Abandon Septic Tanks	EA	351	1000	$ 351,000
4	On-Lot Connections	EA	351	0	$ -
				General Costs Subtotal	$ 3,506,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	30,800	130	$ 4,004,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 17 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,200	40	$ 528,000
8	Construct 6-inch Diameter PVC Force Main	LF	10,700	35	$ 374,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 5,987,000
10	Special case - grinder pump stations	EA	2	20,000	$ 40,000
11	Overhead and Profit (15%)				$ 1,423,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 949,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 142,400
	TOTAL EOPCC				**$ 12,049,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EG

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	68,000	100	$ 6,800,000
2	Sod[3]	SY	16,700	7	$ 116,900
3	Abandon Septic Tanks	EA	759	1000	$ 759,000
4	On-Lot Connections	EA	759	0	$ -
				General Costs Subtotal	$ 7,676,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	150	9000	$ 1,350,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	68,000	130	$ 8,840,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 17 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	28,600	40	$ 1,144,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,200	35	$ 287,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 12,971,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 3,097,050
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,064,700
13	Payment Plus Performance Bond (1.5% Max.)				$ 309,800
	TOTAL EOPCC				**$ 26,119,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EH

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	56,000	100	$ 5,600,000
2	Sod[3]	SY	12,500	7	$ 87,500
3	Abandon Septic Tanks	EA	567	1000	$ 567,000
4	On-Lot Connections	EA	567	0	$ -
				General Costs Subtotal	$ 6,255,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	130	9000	$ 1,170,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	55,200	130	$ 7,176,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 13 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	21,600	40	$ 864,000
8	Construct 6-inch Diameter PVC Force Main	LF	11,500	35	$ 402,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 10,963,000
10	Special case - grinder pump stations	EA	14	20,000	$ 280,000
11	Overhead and Profit (15%)				$ 2,582,700
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,721,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 258,300
	TOTAL EOPCC				**$ 22,061,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EI

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	204,000	100	$ 20,400,000
2	Sod[3]	SY	25,500	7	$ 178,500
3	Abandon Septic Tanks	EA	1,157	1000	$ 1,157,000
4	On-Lot Connections	EA	1157	0	$ -
				General Costs Subtotal	$ 21,736,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	450	9000	$ 4,050,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	152,800	130	$ 19,864,000
	10-inch diameter	LF	51,000	150	$ 7,650,000
	PVC SDR 26				
	Maximum depth 19 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	80,400	40	$ 3,216,000
8	Construct 6-inch Diameter PVC Force Main	LF	32,000	35	$ 1,120,000
9	Construct Lift Station	LS	9	450000	$ 4,050,000
				Gravity System Subtotal	$ 39,950,000
10	Special case - grinder pump stations	EA	20	20,000	$ 400,000
11	Overhead and Profit (15%)				$ 9,252,900
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 6,168,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 925,300
	TOTAL EOPCC				**$ 78,433,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EJ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	42,000	100	$ 4,200,000
2	Sod[3]	SY	10,300	7	$ 72,100
3	Abandon Septic Tanks	EA	467	1000	$ 467,000
4	On-Lot Connections	EA	467	0	$ -
				General Costs Subtotal	$ 4,740,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	100	9000	$ 900,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	31,300	130	$ 4,069,000
	10-inch diameter	LF	10,500	150	$ 1,575,000
	PVC SDR 26				
	Maximum depth 17 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	16,600	40	$ 664,000
8	Construct 6-inch Diameter PVC Force Main	LF	12,000	35	$ 420,000
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 9,428,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,125,200
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,416,800
13	Payment Plus Performance Bond (1.5% Max.)				$ 212,600
	TOTAL EOPCC				**$ 17,923,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EK

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	16,000	100	$ 1,600,000
2	Sod[3]	SY	3,900	7	$ 27,300
3	Abandon Septic Tanks	EA	177	1000	$ 177,000
4	On-Lot Connections	EA	177	0	$ -
				General Costs Subtotal	$ 1,805,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	15,400	130	$ 2,002,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,600	40	$ 264,000
8	Construct 6-inch Diameter PVC Force Main	LF	0	35	$ -
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 3,076,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 732,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 488,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 73,300
	TOTAL EOPCC				**$ 6,175,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EL

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	18,000	100	$ 1,800,000
2	Sod[3]	SY	12,500	7	$ 87,500
3	Abandon Septic Tanks	EA	568	1000	$ 568,000
4	On-Lot Connections	EA	568	0	$ -
				General Costs Subtotal	$ 2,456,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	13,900	130	$ 1,807,000
	10-inch diameter	LF	3,500	150	$ 525,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	19,100	40	$ 764,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,000	35	$ 140,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 4,496,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 1,042,800
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 695,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 104,300
	TOTAL EOPCC				**$ 8,795,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EM

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	30,000	100	$ 3,000,000
2	Sod[3]	SY	5,000	7	$ 35,000
3	Abandon Septic Tanks	EA	224	1000	$ 224,000
4	On-Lot Connections	EA	224	0	$ -
				General Costs Subtotal	$ 3,259,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	29,900	130	$ 3,887,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	12,900	40	$ 516,000
8	Construct 6-inch Diameter PVC Force Main	LF	65,400	35	$ 2,289,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 8,222,000
10	Special case - grinder pump stations	EA	65	20,000	$ 1,300,000
11	Overhead and Profit (15%)				$ 1,722,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,148,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 172,300
			TOTAL EOPCC		**$ 15,824,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EN

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	300	7	$ 2,100
3	Abandon Septic Tanks	EA	10	1000	$ 10,000
4	On-Lot Connections	EA	10	0	$ -
				General Costs Subtotal	$ 13,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 18 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	30,900	35	$ 1,081,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 1,532,000
10	Special case - grinder pump stations	EA	24	20,000	$ 480,000
11	Overhead and Profit (15%)				$ 231,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 154,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 23,200
	TOTAL EOPCC				**$ 2,435,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)

6'' Limerock Base (LBR 100)

12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

PPA EO

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	18,000	100	$ 1,800,000
2	Sod[3]	SY	3,900	7	$ 27,300
3	Abandon Septic Tanks	EA	175	1000	$ 175,000
4	On-Lot Connections	EA	175	0	$ -
				General Costs Subtotal	$ 2,003,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	14,400	130	$ 1,872,000
	10-inch diameter	LF	3,600	150	$ 540,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,500	40	$ 340,000
8	Construct 6-inch Diameter PVC Force Main	LF	37,000	35	$ 1,295,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 5,307,000
10	Special case - grinder pump stations	EA	14	20,000	$ 280,000
11	Overhead and Profit (15%)				$ 1,096,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 731,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 109,700
	TOTAL EOPCC				**$ 9,528,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EP

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	0	100	$ -
2	Sod[3]	SY	900	7	$ 6,300
3	Abandon Septic Tanks	EA	39	1000	$ 39,000
4	On-Lot Connections	EA	39	0	$ -
				General Costs Subtotal	$ 46,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	0	9000	$ -
6	Construct Gravity Sewer				
	8-inch diameter	LF	0	130	$ -
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 18 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	0	40	$ -
8	Construct 6-inch Diameter PVC Force Main	LF	67,700	35	$ 2,369,500
9	Construct Lift Station	LS	8	450000	$ 3,600,000
				Gravity System Subtotal	$ 5,970,000
10	Special case - grinder pump stations	EA	59	20,000	$ 1,180,000
11	Overhead and Profit (15%)				$ 902,400
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 601,600
13	Payment Plus Performance Bond (1.5% Max.)				$ 90,300
	TOTAL EOPCC				**$ 8,791,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EQ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	241,000	100	$ 24,100,000
2	Sod[3]	SY	44,900	7	$ 314,300
3	Abandon Septic Tanks	EA	2,040	1000	$ 2,040,000
4	On-Lot Connections	EA	2040	0	$ -
				General Costs Subtotal	$ 26,455,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	530	9000	$ 4,770,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	180,700	130	$ 23,491,000
	10-inch diameter	LF	60,300	150	$ 9,045,000
	PVC SDR 26				
	Maximum depth 18 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	87,700	40	$ 3,508,000
8	Construct 6-inch Diameter PVC Force Main	LF	85,800	35	$ 3,003,000
9	Construct Lift Station	LS	9	450000	$ 4,050,000
				Gravity System Subtotal	$ 47,867,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 11,148,300
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 7,432,200
13	Payment Plus Performance Bond (1.5% Max.)				$ 1,114,900
	TOTAL EOPCC				**$ 94,018,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA ER

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	80,000	100	$ 8,000,000
2	Sod[3]	SY	14,100	7	$ 98,700
3	Abandon Septic Tanks	EA	637	1000	$ 637,000
4	On-Lot Connections	EA	637	0	$ -
				General Costs Subtotal	$ 8,736,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	180	9000	$ 1,620,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	31,800	130	$ 4,134,000
	10-inch diameter	LF	47,700	150	$ 7,155,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	36,300	40	$ 1,452,000
8	Construct 6-inch Diameter PVC Force Main	LF	73,600	35	$ 2,576,000
9	Construct Lift Station	LS	4	450000	$ 1,800,000
				Gravity System Subtotal	$ 18,737,000
10	Special case - grinder pump stations	EA	25	20,000	$ 500,000
11	Overhead and Profit (15%)				$ 4,120,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 2,747,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 412,100
	TOTAL EOPCC				**$ 35,254,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA ES

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	18,000	100	$ 1,800,000
2	Sod[3]	SY	6,800	7	$ 47,600
3	Abandon Septic Tanks	EA	307	1000	$ 307,000
4	On-Lot Connections	EA	307	0	$ -
				General Costs Subtotal	$ 2,155,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	40	9000	$ 360,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	17,800	130	$ 2,314,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	6,500	40	$ 260,000
8	Construct 6-inch Diameter PVC Force Main	LF	76,600	35	$ 2,681,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 6,515,000
10	Special case - grinder pump stations	EA	230	20,000	$ 4,600,000
11	Overhead and Profit (15%)				$ 1,300,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 867,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 130,100
	TOTAL EOPCC				**$ 15,568,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA ET

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	533,000	100	$ 53,300,000
2	Sod[3]	SY	9,400	7	$ 65,800
3	Abandon Septic Tanks	EA	424	1000	$ 424,000
4	On-Lot Connections	EA	424	0	$ -
				General Costs Subtotal	$ 53,790,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	1,180	9000	$ 10,620,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	532,500	130	$ 69,225,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 3 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	226,200	40	$ 9,048,000
8	Construct 6-inch Diameter PVC Force Main	LF	141,200	35	$ 4,942,000
9	Construct Lift Station	LS	22	450000	$ 9,900,000
				Gravity System Subtotal	$ 103,735,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 23,628,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 15,752,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 2,362,900
	TOTAL EOPCC				**$ 199,270,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EU

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	19,000	100	$ 1,900,000
2	Sod[3]	SY	10,800	7	$ 75,600
3	Abandon Septic Tanks	EA	490	1000	$ 490,000
4	On-Lot Connections	EA	490	0	$ -
				General Costs Subtotal	$ 2,466,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	50	9000	$ 450,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	13,700	130	$ 1,781,000
	10-inch diameter	LF	4,600	150	$ 690,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	4,800	40	$ 192,000
8	Construct 6-inch Diameter PVC Force Main	LF	19,000	35	$ 665,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 4,678,000
10	Special case - grinder pump stations	EA	473	20,000	$ 9,450,000
11	Overhead and Profit (15%)				$ 1,071,600
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 714,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 107,200
	TOTAL EOPCC				**$ 18,488,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EV

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	32,000	100	$ 3,200,000
2	Sod[3]	SY	5,000	7	$ 35,000
3	Abandon Septic Tanks	EA	223	1000	$ 223,000
4	On-Lot Connections	EA	223	0	$ -
				General Costs Subtotal	$ 3,458,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	80	9000	$ 720,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	24,000	130	$ 3,120,000
	10-inch diameter	LF	8,000	150	$ 1,200,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	5,400	40	$ 216,000
8	Construct 6-inch Diameter PVC Force Main	LF	16,300	35	$ 570,500
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 7,177,000
10	Special case - grinder pump stations	EA	180	20,000	$ 3,600,000
11	Overhead and Profit (15%)				$ 1,595,250
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,063,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 159,600
	TOTAL EOPCC				**$ 17,054,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EW

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	51,000	100	$ 5,100,000
2	Sod[3]	SY	5,300	7	$ 37,100
3	Abandon Septic Tanks	EA	240	1000	$ 240,000
4	On-Lot Connections	EA	240	0	$ -
				General Costs Subtotal	$ 5,378,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	120	9000	$ 1,080,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	37,900	130	$ 4,927,000
	10-inch diameter	LF	12,700	150	$ 1,905,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	11,600	40	$ 464,000
8	Construct 6-inch Diameter PVC Force Main	LF	8,700	35	$ 304,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 9,581,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,243,850
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,495,900
13	Payment Plus Performance Bond (1.5% Max.)				$ 224,400
	TOTAL EOPCC				**$ 18,924,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EX

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	25,000	100	$ 2,500,000
2	Sod[3]	SY	4,900	7	$ 34,300
3	Abandon Septic Tanks	EA	219	1000	$ 219,000
4	On-Lot Connections	EA	219	0	$ -
				General Costs Subtotal	$ 2,754,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	60	9000	$ 540,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	24,500	130	$ 3,185,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 14 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	8,000	40	$ 320,000
8	Construct 6-inch Diameter PVC Force Main	LF	20,900	35	$ 731,500
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 5,227,000
10	Special case - grinder pump stations	EA	84	20,000	$ 1,680,000
11	Overhead and Profit (15%)				$ 1,197,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 798,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 119,800
	TOTAL EOPCC				**$ 11,777,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EY

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	33,000	100	$ 3,300,000
2	Sod[3]	SY	6,300	7	$ 44,100
3	Abandon Septic Tanks	EA	285	1000	$ 285,000
4	On-Lot Connections	EA	285	0	$ -
				General Costs Subtotal	$ 3,630,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	80	9000	$ 720,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	32,700	130	$ 4,251,000
	10-inch diameter	LF	0	150	$ -
	PVC SDR 26				
	Maximum depth 30 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	10,500	40	$ 420,000
8	Construct 6-inch Diameter PVC Force Main	LF	5,700	35	$ 199,500
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 6,491,000
10	Special case - grinder pump stations	EA	67	20,000	$ 1,340,000
11	Overhead and Profit (15%)				$ 1,518,150
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,012,100
13	Payment Plus Performance Bond (1.5% Max.)				$ 151,900
	TOTAL EOPCC				**$ 14,144,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA EZ

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	29,000	100	$ 2,900,000
2	Sod[3]	SY	3,900	7	$ 27,300
3	Abandon Septic Tanks	EA	173	1000	$ 173,000
4	On-Lot Connections	EA	173	0	$ -
				General Costs Subtotal	$ 3,101,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	70	9000	$ 630,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	21,100	130	$ 2,743,000
	10-inch diameter	LF	7,100	150	$ 1,065,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	9,400	40	$ 376,000
8	Construct 6-inch Diameter PVC Force Main	LF	24,000	35	$ 840,000
9	Construct Lift Station	LS	1	450000	$ 450,000
				Gravity System Subtotal	$ 6,104,000
10	Special case - grinder pump stations	EA	60	20,000	$ 1,200,000
11	Overhead and Profit (15%)				$ 1,380,750
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 920,500
13	Payment Plus Performance Bond (1.5% Max.)				$ 138,100
	TOTAL EOPCC				**$ 12,845,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA FA

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	58,000	100	$ 5,800,000
2	Sod[3]	SY	10,300	7	$ 72,100
3	Abandon Septic Tanks	EA	466	1000	$ 466,000
4	On-Lot Connections	EA	466	0	$ -
				General Costs Subtotal	$ 6,339,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	130	9000	$ 1,170,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	43,500	130	$ 5,655,000
	10-inch diameter	LF	14,500	150	$ 2,175,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	17,700	40	$ 708,000
8	Construct 6-inch Diameter PVC Force Main	LF	4,200	35	$ 147,000
9	Construct Lift Station	LS	2	450000	$ 900,000
				Gravity System Subtotal	$ 10,755,000
10	Special case - grinder pump stations	EA	0	20,000	$ -
11	Overhead and Profit (15%)				$ 2,564,100
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,709,400
13	Payment Plus Performance Bond (1.5% Max.)				$ 256,500
	TOTAL EOPCC				**$ 21,624,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA FB

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	59,000	100	$ 5,900,000
2	Sod[3]	SY	6,000	7	$ 42,000
3	Abandon Septic Tanks	EA	271	1000	$ 271,000
4	On-Lot Connections	EA	271	0	$ -
				General Costs Subtotal	$ 6,213,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	130	9000	$ 1,170,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	44,300	130	$ 5,759,000
	10-inch diameter	LF	14,800	150	$ 2,220,000
	PVC SDR 26				
	Maximum depth 15 feet				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	14,700	40	$ 588,000
8	Construct 6-inch Diameter PVC Force Main	LF	70,000	35	$ 2,450,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 13,537,000
10	Special case - grinder pump stations	EA	18	20,000	$ 360,000
11	Overhead and Profit (15%)				$ 2,962,500
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,975,000
13	Payment Plus Performance Bond (1.5% Max.)				$ 296,300
	TOTAL EOPCC				**$ 25,344,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

PPA FC

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
General					
1	Construct Full Depth Pavement Section[2]	LF	38,000	100	$ 3,800,000
2	Sod[3]	SY	5,100	7	$ 35,700
3	Abandon Septic Tanks	EA	229	1000	$ 229,000
4	On-Lot Connections	EA	229	0	$ -
				General Costs Subtotal	$ 4,065,000
Gravity System					
5	Construct New 4-Foot-Diameter Sanitary Manhole	EA	90	9000	$ 810,000
6	Construct Gravity Sewer				
	8-inch diameter	LF	28,300	130	$ 3,679,000
	10-inch diameter	LF	9,500	150	$ 1,425,000
	PVC SDR 26				
	Maximum depth 15 feet - Assuming 2 LSs				
7	Construct 4-inch Sanitary Sewer Laterals[4]	LF	13,600	40	$ 544,000
8	Construct 6-inch Diameter PVC Force Main	LF	72,000	35	$ 2,520,000
9	Construct Lift Station	LS	3	450000	$ 1,350,000
				Gravity System Subtotal	$ 10,328,000
10	Special case - grinder pump stations	EA	10	20,000	$ 200,000
11	Overhead and Profit (15%)				$ 2,158,950
12	Sitework, Mobilization/Demobilization, Maintenance of Traffic, Dewatering (10%)				$ 1,439,300
13	Payment Plus Performance Bond (1.5% Max.)				$ 215,900
	TOTAL EOPCC				**$ 18,408,000**

[1] Average length of driveway is assumed to be 15ft and 75% project driveways are assume to be repaired.

[2] 2-1'' Lifts of Superpave Asphalt (SP-9.5) (Traffic C)
6'' Limerock Base (LBR 100)
12'' Type B Stabilization (LBR 40)

[3] 22 yards per house.

[4] Assumes average 30 feet from roadway centerline to property boundary.

Appendix F

Lift Station Drawdown Testing

Marion County

Lift Station Drawdown Testing

Lift Station Name:	FHS-002 (464 at Pine Rd)		
Date:	4/30/2020	**Time Tested:**	6:12pm
Tested By:	Mylene, Mike, Erik, Addison, TJ		

86 hor 30 vert

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	8	in	
	FM Length From Pump to Pressure Gauge	19.7	ft		**Friction "C" Factor**	120		
	Height to Pressure Gauge*	-30	in	-2.5	**∑[Resistance Coeff. (K)]**	2.63		
	Wetwell Volume/ft	376.01	gal/ft					

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3152				CP 3152							
	Impeller			in	code 454			in	code 454			in	
	Horsepower	20				20							
Pump Test	**Static Pressure**	12.5		psi	28.875	12.5		psi	28.875			psi	
	Running Pressure	17		psi	39.27	17		psi	39.27			psi	
	Drawdown Initial Depth**	ft	142	in	11.83	ft	145	in	12.08	ft		in	
	Drawdown Final Depth**	ft	155	in	12.92	ft	160	in	13.33	ft		in	
	Drawdown Time	min	60	sec	1	min	60	sec	1	min		sec	
	Inflow Initial Depth**	ft	153	in	12.75	ft	153	in	12.75	ft		in	
	Inflow Final Depth**	ft	147.5	in	12.29	ft	147.5	in	12.29	ft		in	
	Fill Time	min	60	sec	1.00		60	sec	1.00	min		sec	
	Measure from wet well top down to ground level			in									
	Drawdown Flow	407		gpm		470		gpm		#DIV/0!		gpm	
	Inflow	172		gpm		172		gpm		#DIV/0!		gpm	
	Discharge Velocity	3.70		fps		4.10		fps		#DIV/0!		fps	
	Pipe Friction to Gauge	0.71		ft		0.87		ft		#DIV/0!		ft	Calibrated Model Results
	Pump Head	**50.1**		**ft**		**50.6**		**ft**		**#DIV/0!**		**ft**	
	Pump Flow	**580**		**gpm**		**642**		**gpm**		**#DIV/0!**		**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

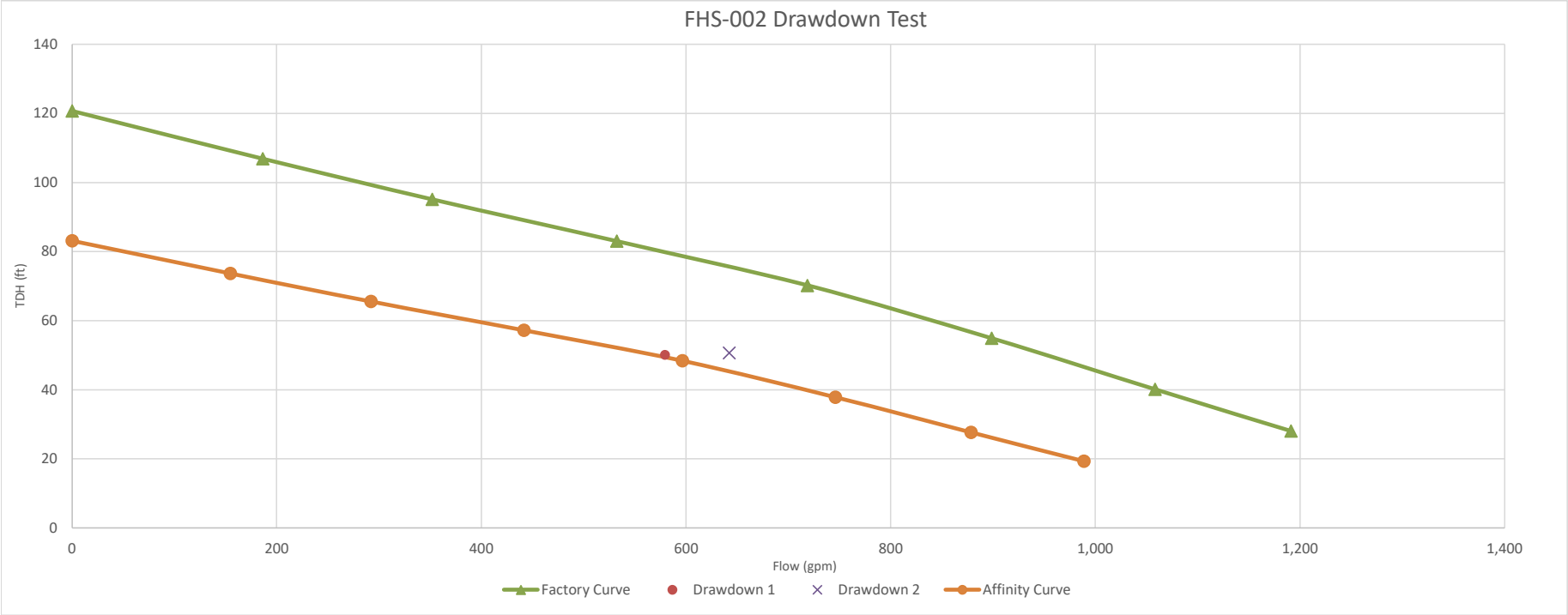
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

6" volute size for pump 1, 4" volute size for pump 2
Initial pump test written on LS door was 230 gpm @98 ft head


FHS-002 Drawdown Test
TDH (ft)
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

LIFT STATION #2
7001 SE MARICAMP RD
OCALA, FL

Lift Station Drawdown Testing

Lift Station Name:	GCC-001 (Near 441 Gate)		
Date:	4/30/2020	**Time Tested:**	3:15
Tested By:	Mylene, Mike, Erik, Addison, TJ		122 hor 50 vert

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	6	in
	FM Length From Pump to Pressure Gauge	26	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-50	in	-4.16666667	**∑[Resistance Coeff. (K)]**	2.82	
	Wetwell Volume/ft	376.01	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3140				NP 3153							
	Impeller			in	code 481			in	code 481				in
	Horsepower	15				15							
Pump Test	**Static Pressure**	7		psi	16.17	8		psi	18.48				psi
	Running Pressure	25		psi	57.75	25		psi	57.75				psi
	Drawdown Initial Depth**	ft	188	in	15.67	ft	194	in	16.17	ft			in
	Drawdown Final Depth**	ft	198	in	16.50	ft	204	in	17.00	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	194	in	16.17	ft	194	in	16.17	ft			in
	Inflow Final Depth**	ft	191	in	15.92	ft	191	in	15.92	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	313		gpm		313		gpm		#DIV/0!			gpm
	Inflow	94		gpm		94		gpm		#DIV/0!			gpm
	Discharge Velocity	4.62		fps		4.62		fps		#DIV/0!			fps
	Pipe Friction to Gauge	1.36		ft		1.36		ft		#DIV/0!			ft
	Pump Head	**71.4**		**ft**		**71.9**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**407**		**gpm**		**407**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

-Select input using dropdown list.

-Input used in calculations.

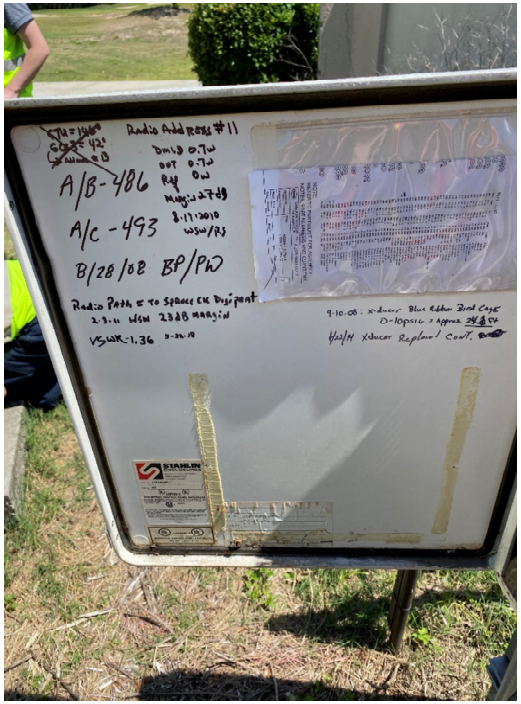
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size

GCC-001 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
100
200
300
400
500
600
700
800
900
1,000
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

1
MARION COUNTY UTILITIES
Lift Station- GCC-001
For Emergency Call
307-6000



DFS
Data Flow Systems

Marion County

Lift Station Drawdown Testing

Lift Station Name:	GCC-006 (Firethorne)		
Date:	4/30/2020	**Time Tested:**	4:00
Tested By:	Mylene, Mike, Erik, Addison, TJ		

60 hori 26 vert

Station Info	**Wetwell Φ (equivalent diameter)**	6.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	28	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-26	in	-2.16666667	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	211.51	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3152				CP 3152							
	Impeller			in	code 454			in	code 454				in
	Horsepower	20				20							
Pump Test	**Static Pressure**	7		psi	16.17	7		psi	16.17				psi
	Running Pressure	25		psi	57.75	23		psi	53.13				psi
	Drawdown Initial Depth**	ft	241.5	in	20.13	ft	254	in	21.17	ft			in
	Drawdown Final Depth**	ft	254	in	21.17	ft	265.5	in	22.13	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	243	in	20.25	ft	243	in	20.25	ft			in
	Inflow Final Depth**	ft	241.5	in	20.13	ft	241.5	in	20.13	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	220		gpm		203		gpm		#DIV/0!			gpm
	Inflow	26		gpm		26		gpm		#DIV/0!			gpm
	Discharge Velocity	6.30		fps		5.85		fps		#DIV/0!			fps
	Pipe Friction to Gauge	3.31		ft		2.87		ft		#DIV/0!			ft
	Pump Head	**80.2**		**ft**		**76.0**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**247**		**gpm**		**229**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

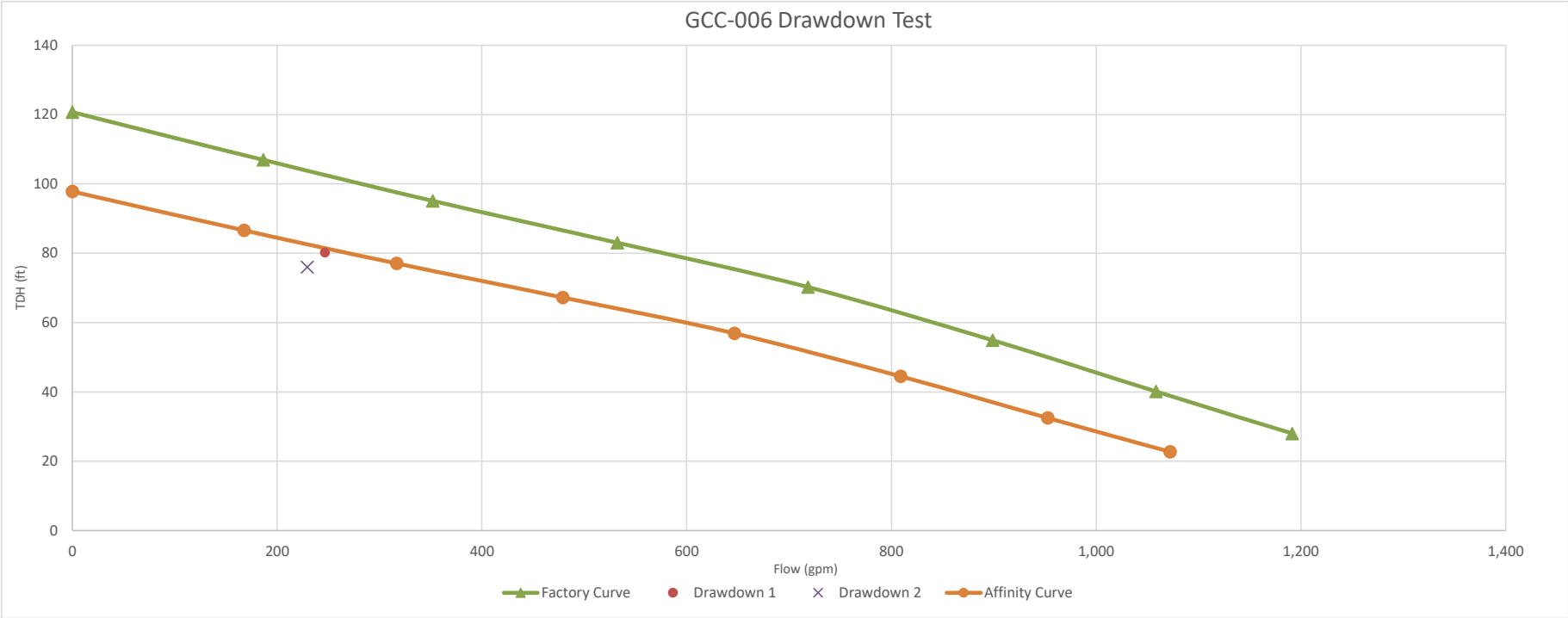
-Select input using dropdown list.

-Input used in calculations.

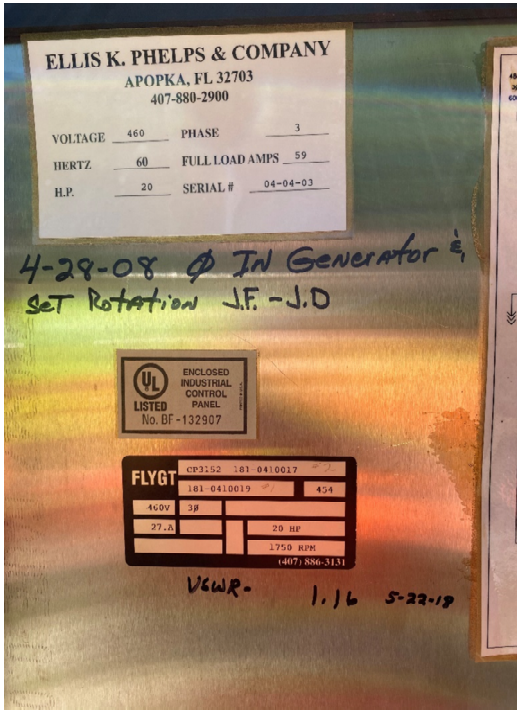
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


GCC-006 Drawdown Test
TDH (ft)
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station- GCC-006
For Emergency Call
307-6000
WARNING


ELLIS K. PHELPS & COMPANY
APOPKA, FL 32703
407-880-2900
VOLTAGE 460
PHASE 3
HERTZ 60
FULL LOAD AMPS 59
H.P. 20
SERIAL # 04-04-03
4-28-08 Ø IN Generator &
SET Rotation J.F. - J.D
ENCLOSED INDUSTRIAL CONTROL PANEL
LISTED
No. BF-132907
FLYGT
460V
27.A
20 HP
1750 RPM
(407) 886-3131
VGWR- 1.16 5-22-18

Marion County

Lift Station Drawdown Testing

Lift Station Name:	GCC-008 (Windward Hills(old wwt		
Date:	4/30/2020	**Time Tested:**	3:30
Tested By:	Mylene, Mike, Erik, Addison, TJ		

32 ∨100 hor

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	14	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-32	in	-2.66666667	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	376.01	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3171				NP 3171							
	Impeller			in	code 454			in	code 454				in
	Horsepower	30				30							
Pump Test	**Static Pressure**	12		psi	27.72	12		psi	27.72				psi
	Running Pressure	20		psi	46.2	20		psi	46.2				psi
	Drawdown Initial Depth**	ft	73	in	6.08	ft	57	in	4.75	ft			in
	Drawdown Final Depth**	ft	97	in	8.08	ft	73	in	6.08	ft			in
	Drawdown Time	min	90	sec	1.5	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	0	in	0.00	ft	0	in	0.00	ft			in
	Inflow Final Depth**	ft	0	in	0.00	ft	0	in	0.00	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	501		gpm		501		gpm		#DIV/0!			gpm
	Inflow	0		gpm		0		gpm		#DIV/0!			gpm
	Discharge Velocity	12.80		fps		12.80		fps		#DIV/0!			fps
	Pipe Friction to Gauge	10.70		ft		10.70		ft		#DIV/0!			ft
	Pump Head	**63.9**		**ft**		**62.2**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**501**		**gpm**		**501**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

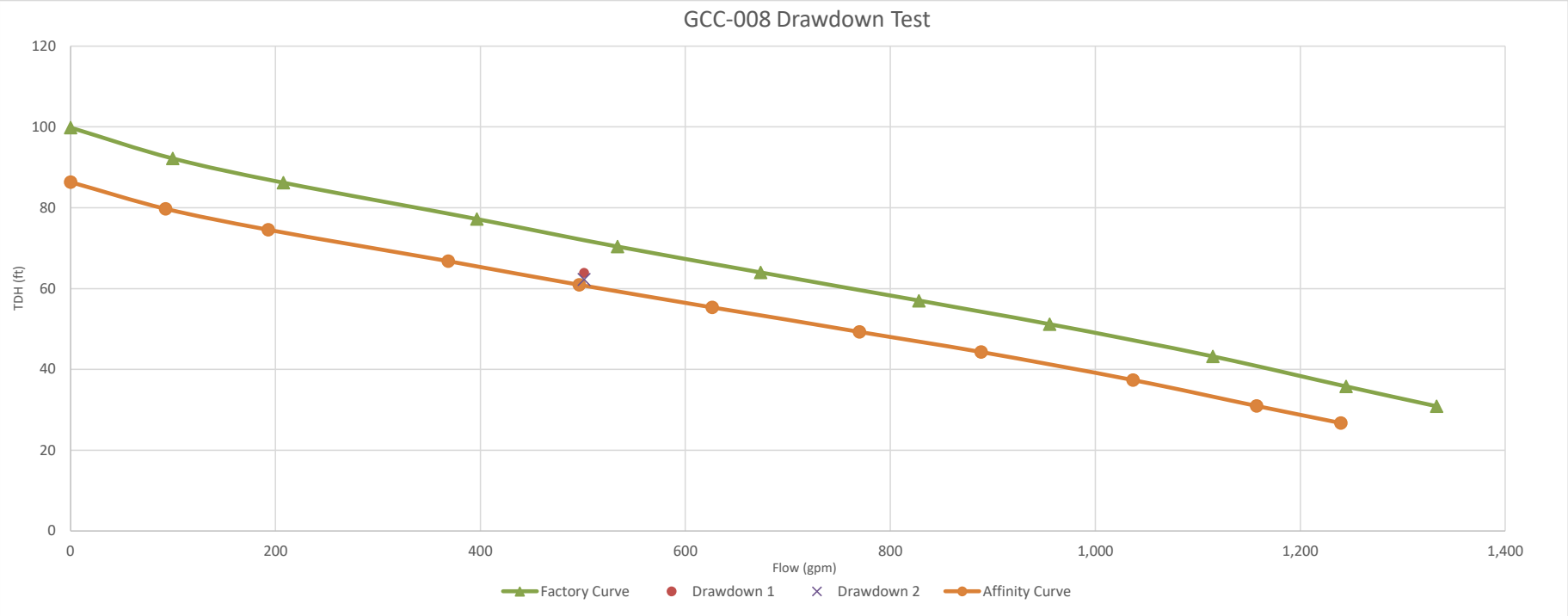
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size
Pump one has a flush valve that has to kick off before test starts


GCC-008 Drawdown Test
120
100
80
60
40
20
0
TDH (ft)
0
200
400
600
800
1,000
1,200
1,400
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SSS-032 (Baseline L S)		
Date:	4/30/2020	**Time Tested:**	6:45pm
Tested By:	Mylene, Mike, Erik, Addison, TJ		

							100 hor	32 vert	
Station Info	**Wetwell Φ (equivalent diameter)**	10.0		ft		**Discharge FM Φ**	6		in
	FM Length From Pump to Pressure Gauge	19.8		ft		**Friction "C" Factor**	120		
	Height to Pressure Gauge*		-32	in	-2.66666667	**∑[Resistance Coeff. (K)]**	2.82		
	Wetwell Volume/ft	587.52		gal/ft					

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3201				CP 3201							
	Impeller			in	code 452			in	code 452				in
	Horsepower	47				47							
Pump Test	**Static Pressure**	8		psi	18.48	8		psi	18.48				psi
	Running Pressure	42		psi	97.02	43		psi	99.33				psi
	Drawdown Initial Depth**	ft	128	in	10.67	ft	127	in	10.58	ft			in
	Drawdown Final Depth**	ft	134	in	11.17	ft	127.5	in	10.63	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	0	in	0.00	ft	125	in	10.42	ft			in
	Inflow Final Depth**	ft	0	in	0.00	ft	119.5	in	9.96	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	294		gpm		24		gpm		#DIV/0!			gpm
	Inflow	0		gpm		269		gpm		#DIV/0!			gpm
	Discharge Velocity	3.33		fps		3.33		fps		#DIV/0!			fps
	Pipe Friction to Gauge	0.66		ft		0.66		ft		#DIV/0!			ft
	Pump Head	**106.1**		**ft**		**108.1**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**294**		**gpm**		**294**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

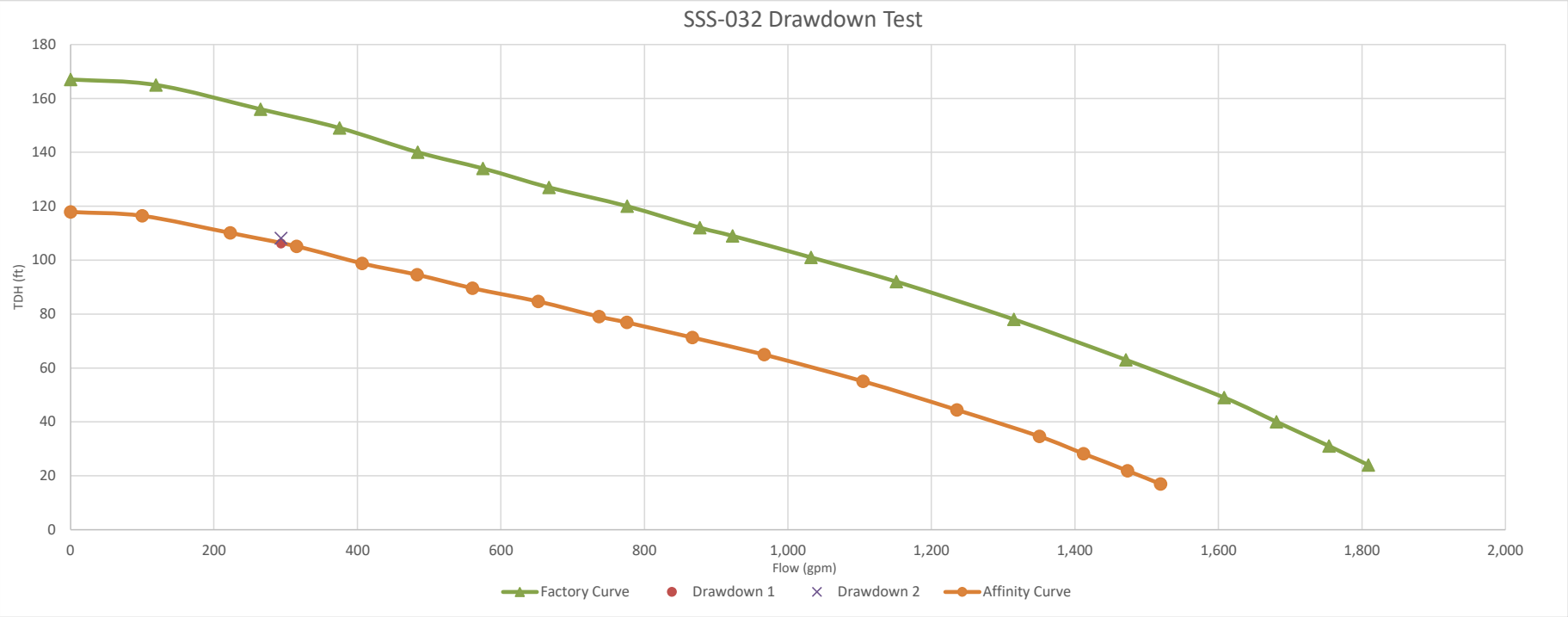
-Select input using dropdown list.

-Input used in calculations.

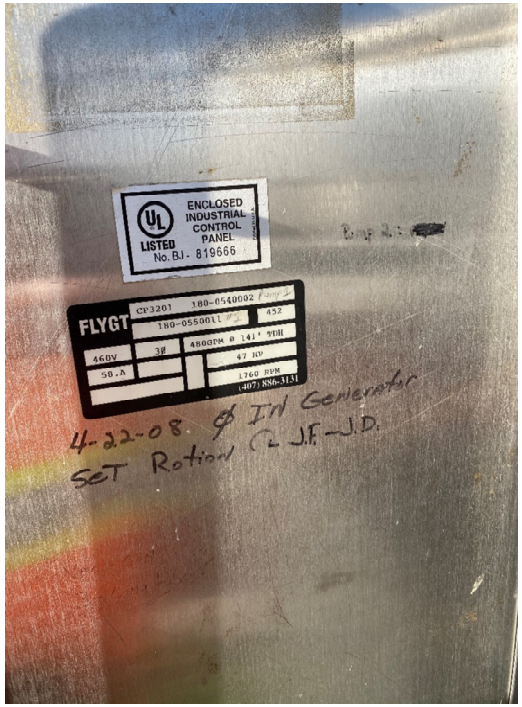
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

6" volute size


SSS-032 Drawdown Test
TDH (ft)
180
160
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station- SSS-032
For Emergency Call
307-6000


ENCLOSED INDUSTRIAL CONTROL PANEL
LISTED
No. BJ. 819666
FLYGT
460V
50.A
3ø
4-22-08 Ø In Generator
SET Rotation @ J.F.-J.D.

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SSS-046 (Sleepy Hollow)		
Date:	4/30/2020	**Time Tested:**	7:00pm
Tested By:	Mylene, Mike, Erik, Addison, TJ		

hor 98 ver 32

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	24.2	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-32	in	-2.66666667	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	376.01	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3153				NP 3153							
	Impeller			in	code 464			in	code 464			in	
	Horsepower	20				20							
Pump Test	**Static Pressure**	15		psi	34.65	15		psi	34.65			psi	
	Running Pressure	21.5		psi	49.665	25		psi	57.75			psi	
	Drawdown Initial Depth**	ft	193	in	16.08	ft	206	in	17.17	ft		in	
	Drawdown Final Depth**	ft	206	in	17.17	ft	210.3	in	17.52	ft		in	
	Drawdown Time	min	60	sec	1	min	30	sec	0.5	min		sec	
	Inflow Initial Depth**	ft	196	in	16.33	ft	196	in	16.33	ft		in	
	Inflow Final Depth**	ft	193	in	16.08	ft	193	in	16.08	ft		in	
	Fill Time	min	60	sec	1.00		60	sec	1.00	min		sec	
	Measure from wet well top down to ground level			in									
	Drawdown Flow	407		gpm		266		gpm		#DIV/0!		gpm	
	Inflow	94		gpm		94		gpm		#DIV/0!		gpm	
	Discharge Velocity	12.80		fps		9.20		fps		#DIV/0!		fps	
	Pipe Friction to Gauge	12.47		ft		6.55		ft		#DIV/0!		ft	Calibrated Model Results
	Pump Head	**78.6**		**ft**		**80.3**		**ft**		**#DIV/0!**		**ft**	
	Pump Flow	**501**		**gpm**		**360**		**gpm**		**#DIV/0!**		**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

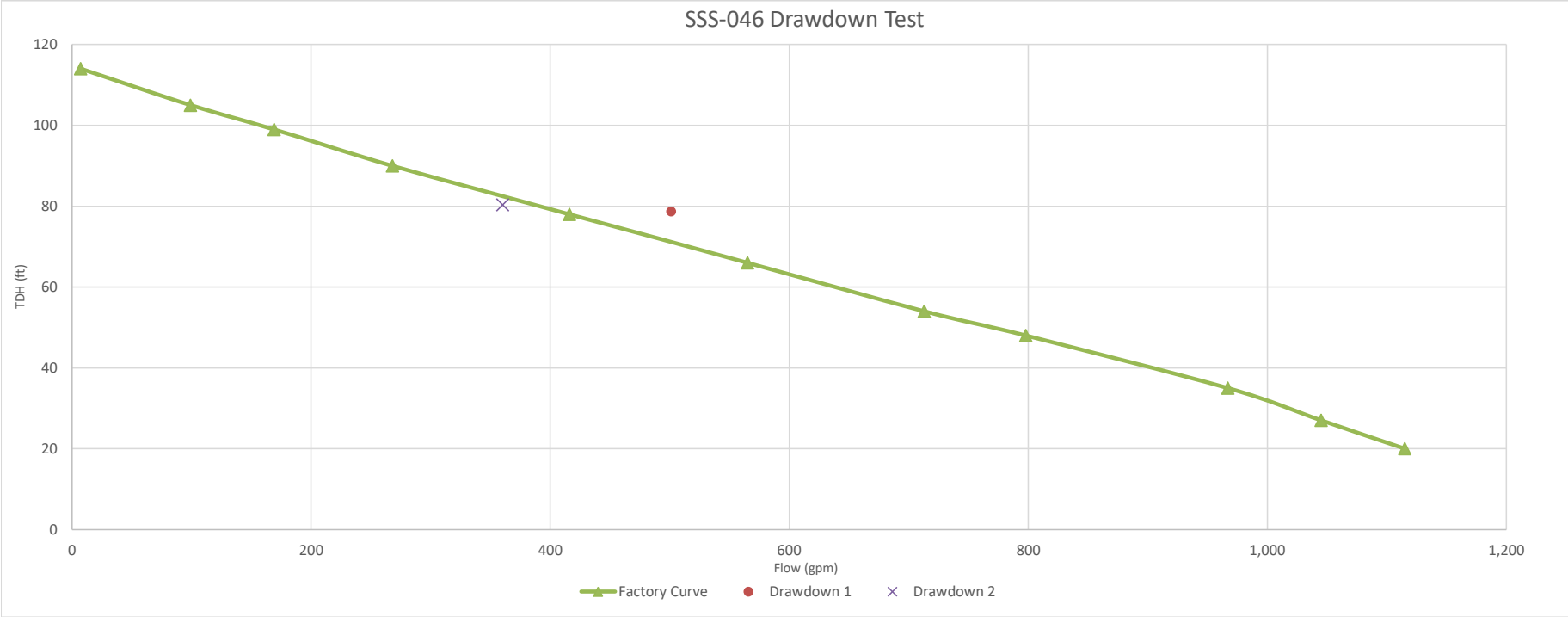
-Select input using dropdown list.

-Input used in calculations.

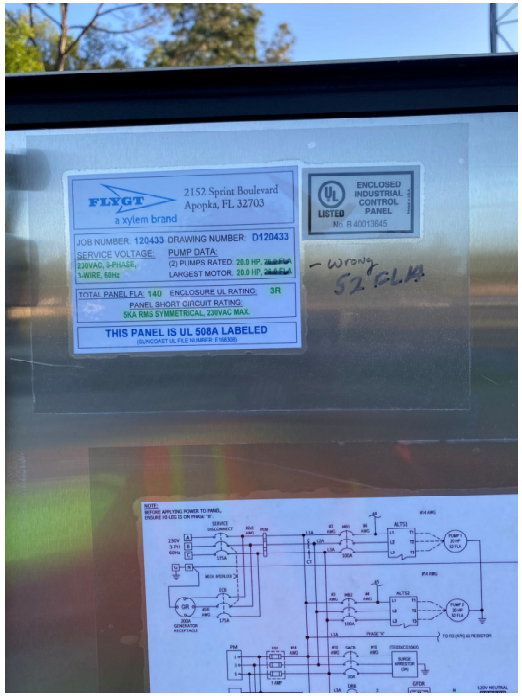
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


SSS-046 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

NO PARKING ANYTIME
VEHICLE WILL BE TOWED AT OWNER'S EXPENSE
MARION COUNTY UTILITIES
LIFT STATION-SSS-046
FOR EMERGENCY CALL
352-307-6000


FLYGT
a xylem brand
2152 Sprint Boulevard
Apopka, FL 32703
ENCLOSED INDUSTRIAL CONTROL PANEL
LISTED
JOB NUMBER: 120433
DRAWING NUMBER: D120433
SERVICE VOLTAGE:
PUMP DATA:
LARGEST MOTOR: 20.0 HP
TOTAL PANEL FLA: 140
ENCLOSURE UL RATING: 3R
THIS PANEL IS UL 508A LABELED
- wrong
52 FLA

Marion County

Lift Station Drawdown Testing

Lift Station Name:	TRI-001 (TRIPLEX)		
Date:	4/30/2020	**Time Tested:**	4:30
Tested By:	Mylene, Mike, Erik, Addison, TJ		

hor 168 vert 56 up

Station Info							
Wetwell Φ (equivalent diameter)	20.2	ft		**Discharge FM Φ**	8	in
FM Length From Pump to Pressure Gauge	30	ft		**Friction "C" Factor**	120	
Height to Pressure Gauge*	56	in	4.666666667	**∑[Resistance Coeff. (K)]**	2.63	
Wetwell Volume/ft	2397.30	gal/ft				

		Pump 2			Pump 3			Pump 1 out			
Pump Info	**Manufacturer**	FLYGT			FLYGT			FLYGT			
	Model	CP 3201			CP 3201			CP 3201			
	Impeller		in	code 452		in	code 452		in	code 452	
	Horsepower	47			47			47			
Pump Test	**Static Pressure**	7.5	psi	17.325	7	psi	16.17		psi		
	Running Pressure	40	psi	92.4	43	psi	99.33		psi		
	Drawdown Initial Depth**	ft 122	in	10.17	ft 121.5	in	10.13	ft	in		
	Drawdown Final Depth**	ft 123.8	in	10.31	ft 124	in	10.33	ft	in		
	Drawdown Time	min 60	sec	1	min 60	sec	1	min	sec		
	Inflow Initial Depth**	ft 125	in	10.42	ft 123	in	10.25	ft	in		
	Inflow Final Depth**	ft 123.5	in	10.29	ft 122	in	10.17	ft	in		
	Fill Time	min 60	sec	1.00	60	sec	1.00	min	sec		
	Measure from wet well top down to ground level		in								
	Drawdown Flow	350	gpm		499	gpm		#DIV/0!	gpm		
	Inflow	300	gpm		200	gpm		#DIV/0!	gpm		
	Discharge Velocity	4.14	fps		4.46	fps		#DIV/0!	fps		
	Pipe Friction to Gauge	0.99	ft		1.14	ft		#DIV/0!	ft		Calibrated Model Results
	Pump Head	**108.6**	**ft**		**115.7**	**ft**		**#DIV/0!**	**ft**		
	Pump Flow	**649**	**gpm**		**699**	**gpm**		**#DIV/0!**	**gpm**		

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

no volute size info
Bottom of wetwell is sloped. Top of slope at 142" and bottom of slope at 159.5"
Rectangular wetwell with length of 20' and 16' wide

TRI-001 Drawdown Test
TDH (ft)
180
160
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station- TRI-001
For Emergency Call
307-6000

Marion County

Lift Station Drawdown Testing

Lift Station Name:	WMT-002 (WalMart Shores)		
Date:	4/30/2020	**Time Tested:**	5:20
Tested By:	Mylene, Mike, Erik, Addison, TJ		

92 hor vert 0

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	6	in	250 @ 110
	FM Length From Pump to Pressure Gauge	26.9	ft		**Friction "C" Factor**	120		
	Height to Pressure Gauge*	0	in	0	**∑[Resistance Coeff. (K)]**	2.82		
	Wetwell Volume/ft	376.01	gal/ft					

		Pump 1				Pump 2				Pump 3				
Pump Info	**Manufacturer**	FLYGT				FLYGT								
	Model	NP 3153				NP 3153								
	Impeller			in	code 462			in	code 462				in	
	Horsepower	20				20								
Pump Test	**Static Pressure**	4		psi	9.24	7		psi	16.17				psi	
	Running Pressure	15		psi	34.65	15		psi	34.65				psi	
	Drawdown Initial Depth**		ft	223.5	in 18.63		ft	222	in 18.50		ft		in	
	Drawdown Final Depth**		ft	231	in 19.25		ft	231.5	in 19.29		ft		in	
	Drawdown Time		min	30	sec 0.5		min	30	sec 0.5		min		sec	
	Inflow Initial Depth**		ft	225	in 18.75		ft	225	in 18.75		ft		in	
	Inflow Final Depth**		ft	225	in 18.75		ft	225	in 18.75		ft		in	
	Fill Time		min	60	sec 1.00			60	sec 1.00		min		sec	
	Measure from wet well top down to ground level				in									
	Drawdown Flow	470		gpm		595		gpm		#DIV/0!			gpm	
	Inflow	0		gpm		0		gpm		#DIV/0!			gpm	
	Discharge Velocity	5.33		fps		6.76		fps		#DIV/0!			fps	
	Pipe Friction to Gauge	1.82		ft		2.89		ft		#DIV/0!			ft	Calibrated Model Results
	Pump Head	**55.9**		**ft**		**57.1**		**ft**		**#DIV/0!**			**ft**	
	Pump Flow	**470**		**gpm**		**595**		**gpm**		**#DIV/0!**			**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

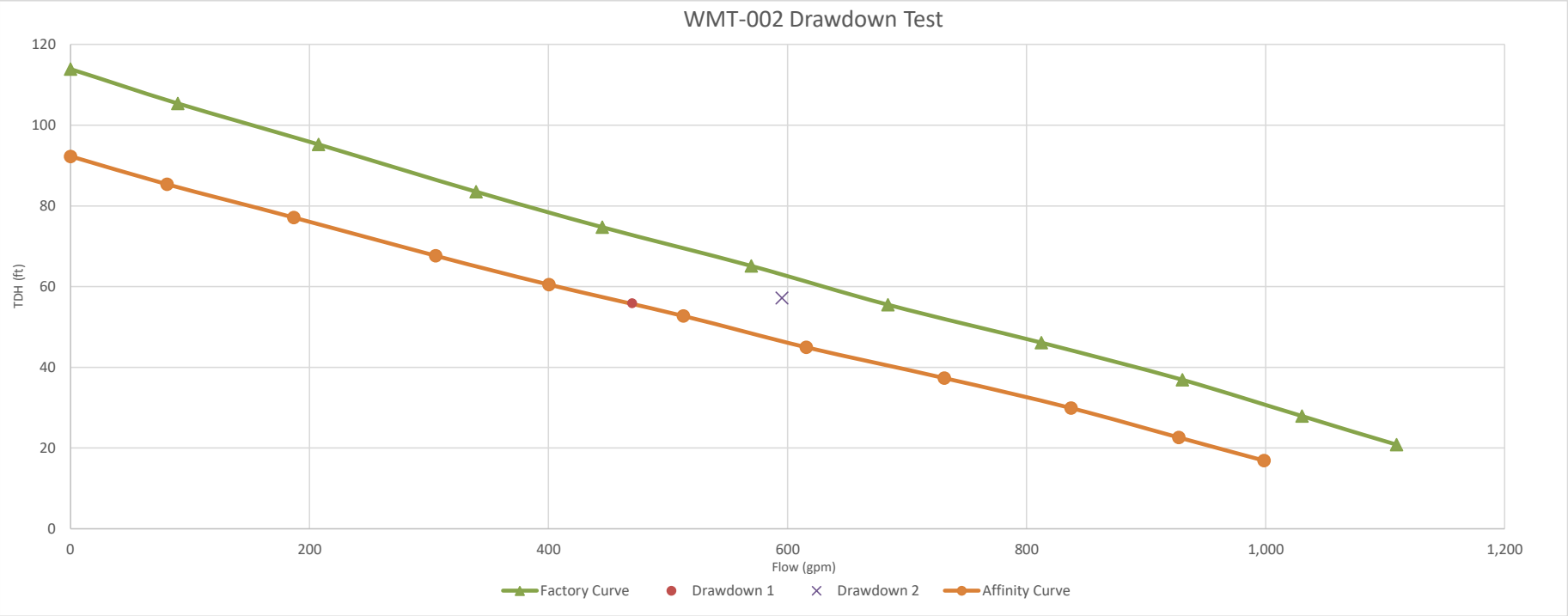
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

no volute size info


WMT-002 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station- WMT-002
For Emergency Call
307-6000
HERCULES FENCES

rms SYMMETRICAL,
480V MAXIMUM.
FLYGT
(407) 886-3131

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SCP-004		
Date:	4/30/2020	**Time Tested:**	11:00
Tested By:	TJ, mike, sam, erik, addison		

160 hor

Station Info	**Wetwell Φ (equivalent diameter)**	10.0	ft		**Discharge FM Φ**	8	in
	FM Length From Pump to Pressure Gauge	24.16	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-38	in	-3.16666667	**∑[Resistance Coeff. (K)]**	2.63	
	Wetwell Volume/ft	587.52	gal/ft				

		Pump 1			Pump 2			Pump 3		
Pump Info	**Manufacturer**	FLYGT			FLYGT					
	Model	NP 3202			NP 3202					
	Impeller		in	code 468		in	code 468		in	
	Horsepower	45			45					
Pump Test	**Static Pressure**	27	psi	62.37	27	psi	62.37		psi	
	Running Pressure	55	psi	127.05	56	psi	129.36		psi	
	Drawdown Initial Depth**	ft 126	in	10.50	ft 115	in	9.58	ft	in	
	Drawdown Final Depth**	ft 129.5	in	10.79	ft 122.5	in	10.21	ft	in	
	Drawdown Time	min 38	sec	0.633333333	min 60	sec	1	min	sec	
	Inflow Initial Depth**	ft 0	in	0.00	ft 0	in	0.00	ft	in	
	Inflow Final Depth**	ft 0	in	0.00	ft 0	in	0.00	ft	in	
	Fill Time	min 60	sec	1.00	60	sec	1.00	min	sec	
	Measure from wet well top down to ground level		in							
	Drawdown Flow	271	gpm		367	gpm		#DIV/0!	gpm	
	Inflow	0	gpm		0	gpm		#DIV/0!	gpm	
	Discharge Velocity	1.73	fps		2.34	fps		#DIV/0!	fps	
	Pipe Friction to Gauge	0.17	ft		0.31	ft		#DIV/0!	ft	Calibrated Model Results
	Pump Head	**134.7**	**ft**		**136.5**	**ft**		**#DIV/0!**	**ft**	
	Pump Flow	**271**	**gpm**		**367**	**gpm**		**#DIV/0!**	**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

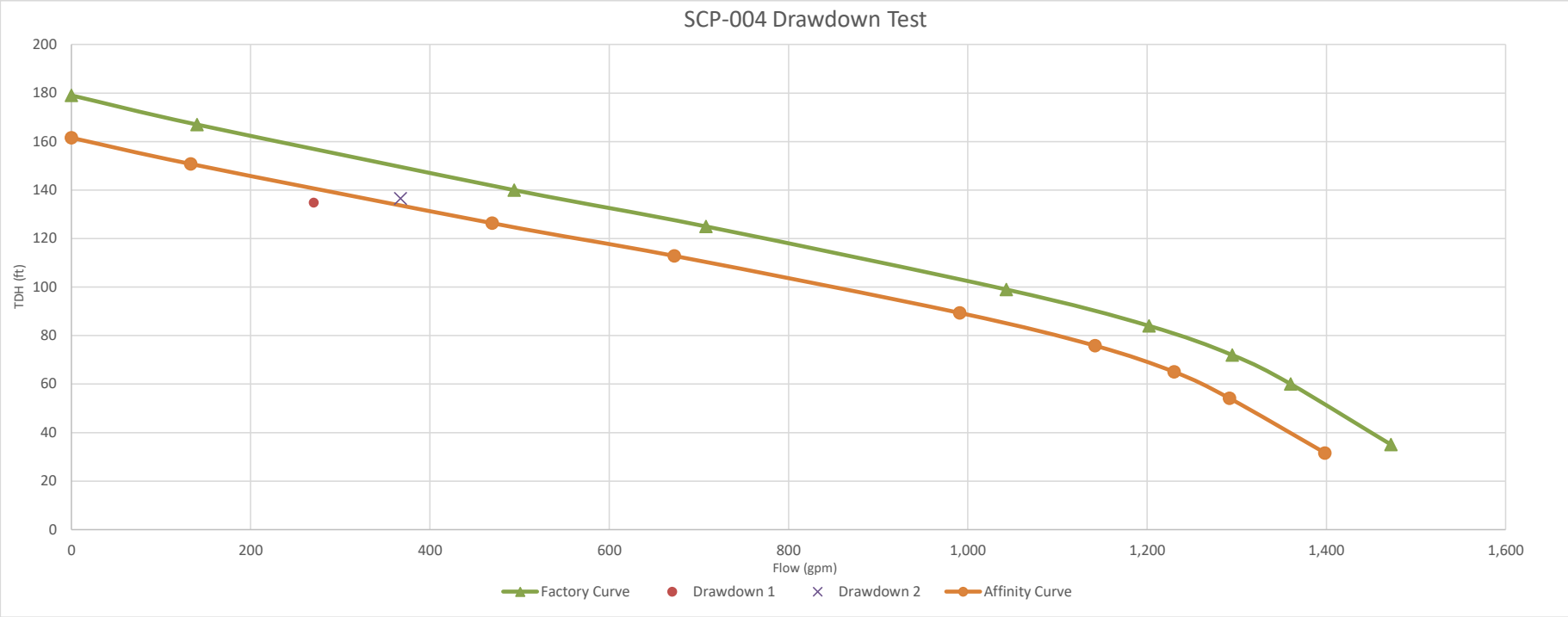
-Select input using dropdown list.

-Input used in calculations.

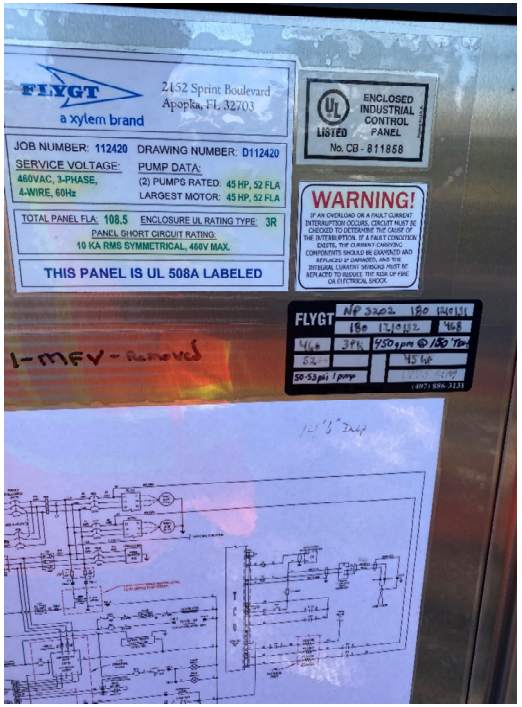
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

6" volute size for pump 1, 4" volute size for pump 2


SCP-004 Drawdown Test
TDH (ft)
Flow (gpm)
0
20
40
60
80
100
120
140
160
180
200
0
200
400
600
800
1,000
1,200
1,400
1,600
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY DUPLEX
SPRUCE CREEK PRESERVE
OAK RUN FM and RCW


FLYGT
a xylem brand
2452 Sprint Boulevard
Apopka, FL 32703
ENCLOSED INDUSTRIAL CONTROL PANEL
LISTED
No. CB - 811858
JOB NUMBER: 112420
DRAWING NUMBER: D112420
SERVICE VOLTAGE:
460VAC, 3-PHASE, 4-WIRE, 60Hz
PUMP DATA:
(2) PUMPS RATED: 45 HP, 52 FLA
LARGEST MOTOR: 45 HP, 52 FLA
TOTAL PANEL FLA: 108.5
ENCLOSURE UL RATING TYPE: 3R
PANEL SHORT CIRCUIT RATING:
10 KA RMS SYMMETRICAL, 460V MAX.
THIS PANEL IS UL 508A LABELED
WARNING!
FLYGT
1-MFV - Removed

Marion County

Lift Station Drawdown Testing

Lift Station Name:	OKR-008		
Date:	4/30/2020	**Time Tested:**	9:30
Tested By:			

Station Info	**Wetwell Φ (equivalent diameter)**	10.0	ft			100 hor 32 vert	
	FM Length From Pump to Pressure Gauge	24.16	ft		**Discharge FM Φ**	6	in
	Height to Pressure Gauge*	-32	in	-2.66666667	**Friction "C" Factor**	120	
	Wetwell Volume/ft	587.52	gal/ft		**∑[Resistance Coeff. (K)]**	2.82	

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3171				NP 3171							
	Impeller			in	code 455			in	code 455				in
	Horsepower	30				30							
Pump Test	**Static Pressure**	26		psi	60.06	26		psi	60.06				psi
	Running Pressure	29		psi	66.99	29		psi	66.99				psi
	Drawdown Initial Depth**	ft	156	in	13.00	ft	160	in	13.33	ft			in
	Drawdown Final Depth**	ft	162	in	13.50	ft	167	in	13.92	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	190	in	15.83	ft	190	in	15.83	ft			in
	Inflow Final Depth**	ft	183.5	in	15.29	ft	183.5	in	15.29	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	294		gpm		343		gpm		#DIV/0!			gpm
	Inflow	318		gpm		318		gpm		#DIV/0!			gpm
	Discharge Velocity	6.94		fps		7.50		fps		#DIV/0!			fps
	Pipe Friction to Gauge	2.95		ft		3.44		ft		#DIV/0!			ft
	Pump Head	**81.3**		**ft**		**82.3**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**612**		**gpm**		**661**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

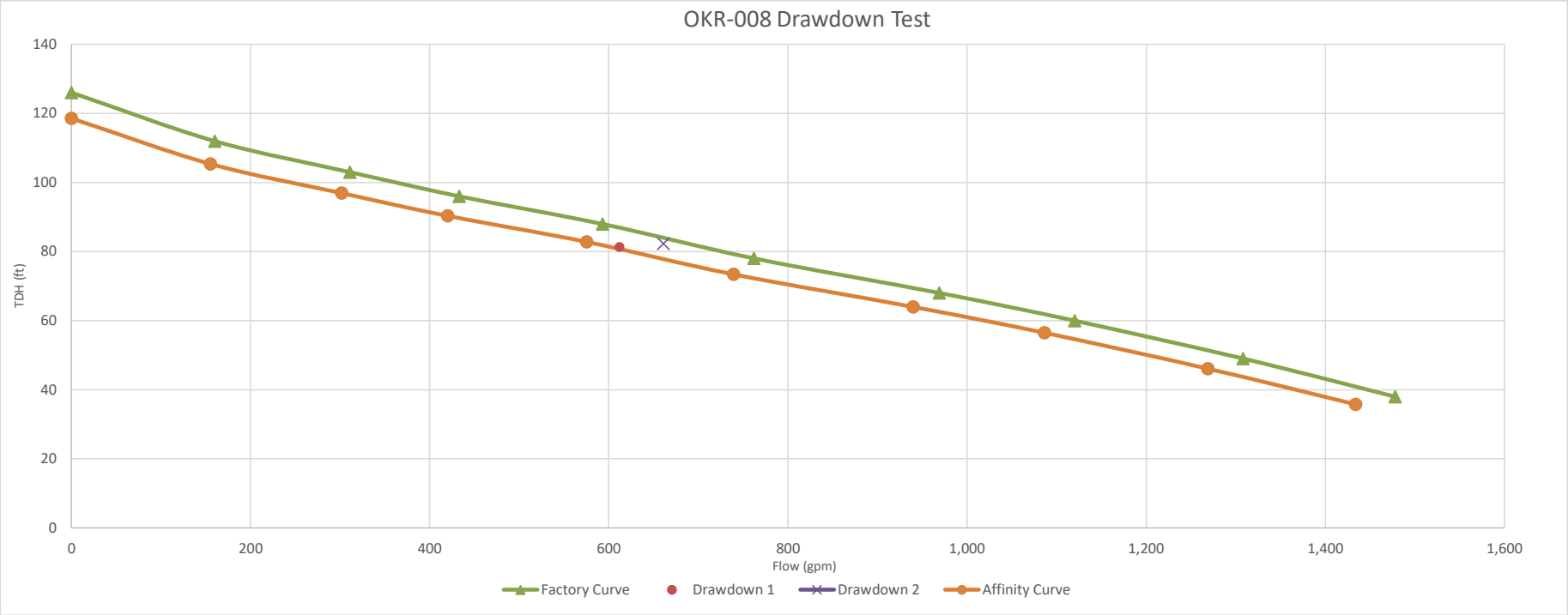
-Select input using dropdown list.

-Input used in calculations.

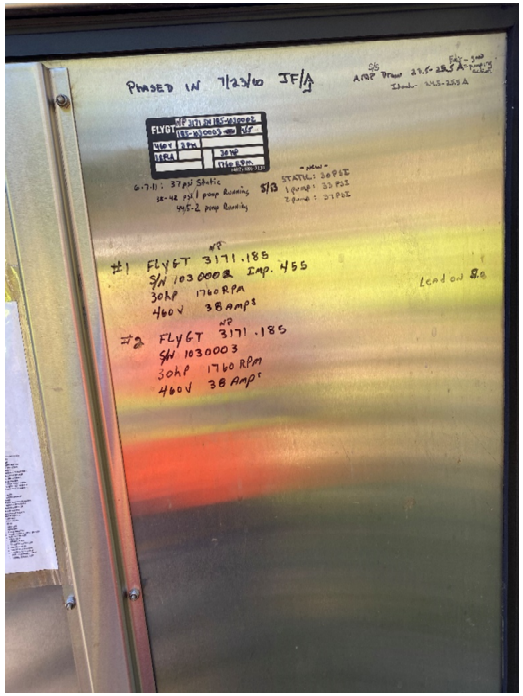
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size
Downstream FM changed from 12" to 24"
Lots of air in the discharging FM
Riser pipe is HDPE


OKR-008 Drawdown Test
TDH (ft)
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station-OKR-008
For Emergency Call
307-6000


PHASED IN 7/23/10 JF/A
#1 FLYGT 3171.185
S/N 1030002 Imp. 455
30HP 1760 RPM
460V 38 amps
#2 FLYGT 3171.185
S/N 1030003
30HP 1760 RPM
460V 38 Amps

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SMG-009		
Date:	4/30/2020	**Time Tested:**	12:00
Tested By:			

Station Info	**Wetwell Φ (equivalent diameter)**	12.0	ft
	FM Length From Pump to Pressure Gauge	25.5	ft
	Height to Pressure Gauge*	0	in
	Wetwell Volume/ft	846.02	gal/ft

		70	
	Discharge FM Φ	8	in
	Friction "C" Factor	120	
0	**∑[Resistance Coeff. (K)]**	2.63	

		Pump 1			Pump 2			Pump 3		
Pump Info	**Manufacturer**	FLYGT			FLYGT					
	Model	NP 3153			NP 3153					
	Impeller		in	code 464		in	code 464		in	
	Horsepower	15			15					
Pump Test	**Static Pressure**	7	psi	16.17	8	psi	18.48		psi	
	Running Pressure	20	psi	46.2	20	psi	46.2		psi	
	Drawdown Initial Depth**	ft 180	in	15.00	ft 182.5	in	15.21	ft	in	
	Drawdown Final Depth**	ft 185	in	15.42	ft 187.5	in	15.63	ft	in	
	Drawdown Time	min 60	sec	1	min 60	sec	1	min	sec	
	Inflow Initial Depth**	ft 186	in	15.50	ft 184	in	15.33	ft	in	
	Inflow Final Depth**	ft 185	in	15.42	ft 183	in	15.25	ft	in	
	Fill Time	min 60	sec	1.00	60	sec	1.00	min	sec	
	Measure from wet well top down to ground level		in							
	Drawdown Flow	353	gpm		353	gpm		#DIV/0!	gpm	
	Inflow	71	gpm		71	gpm		#DIV/0!	gpm	
	Discharge Velocity	2.70	fps		2.70	fps		#DIV/0!	fps	
	Pipe Friction to Gauge	0.41	ft		0.41	ft		#DIV/0!	ft	Calibrated Model Results
	Pump Head	**61.9**	**ft**		**62.1**	**ft**		**#DIV/0!**	**ft**	
	Pump Flow	**423**	**gpm**		**423**	**gpm**		**#DIV/0!**	**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

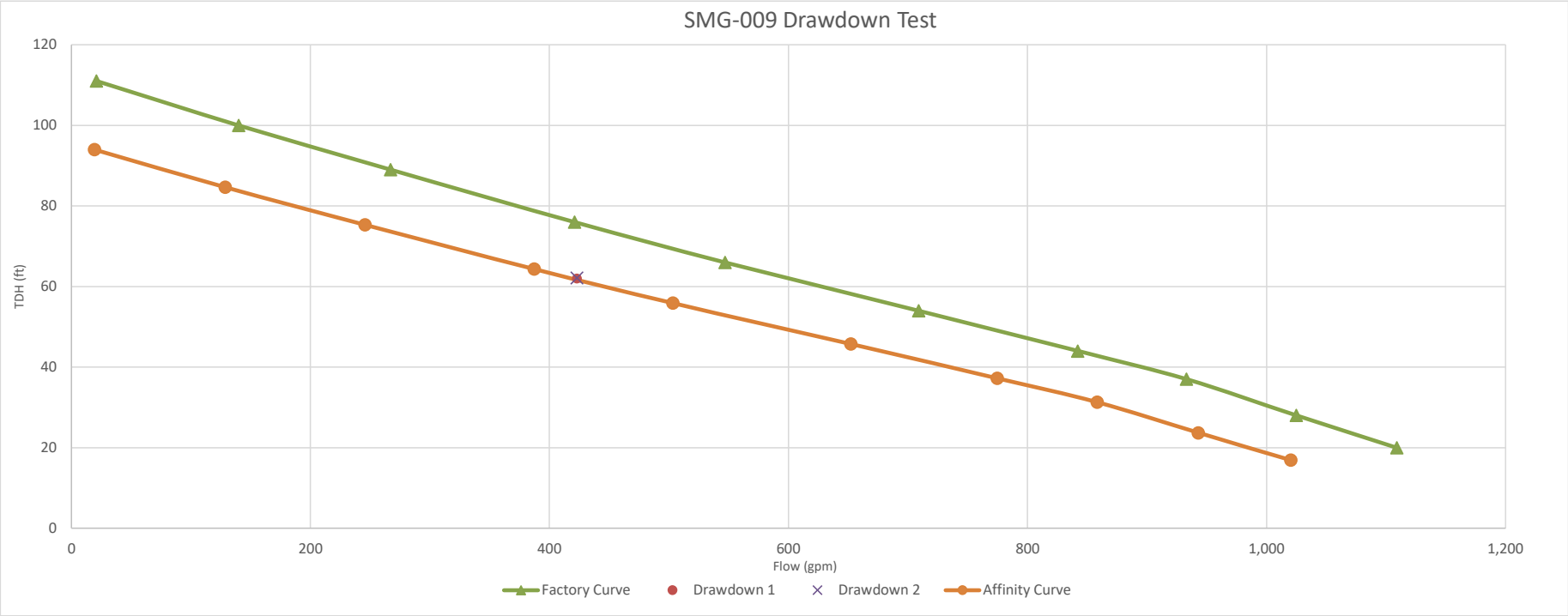
-Select input using dropdown list.

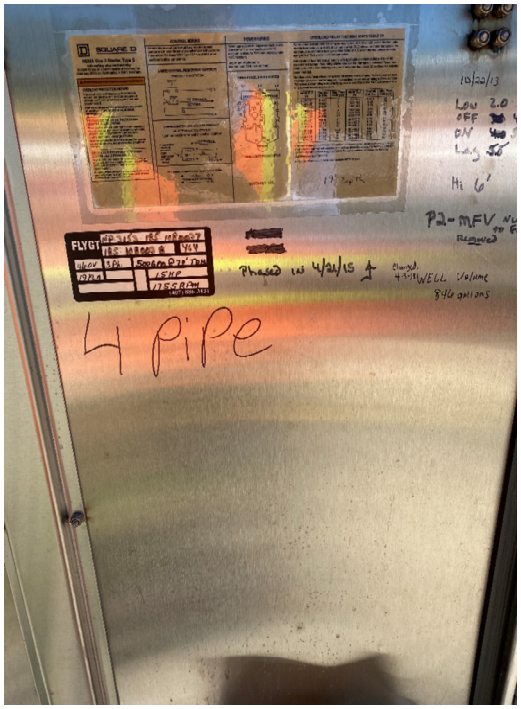
-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size for pump 1, ?" volute size for pump 2


SMG-009 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve


4 pipe

Marion County

Lift Station Drawdown Testing

Lift Station Name:	MOK-002		
Date:	4/30/2020	**Time Tested:**	11:30
Tested By:			

88 hor

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	6	in
	FM Length From Pump to Pressure Gauge	25.58	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-16	in	-1.33333333	**∑[Resistance Coeff. (K)]**	2.82	
	Wetwell Volume/ft	376.01	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3201				CP 3201							
	Impeller			in	code 452			in	code 452				in
	Horsepower	47				47							
Pump Test	**Static Pressure**	8		psi	18.48	8		psi	18.48				psi
	Running Pressure	47		psi	108.57	47		psi	108.57				psi
	Drawdown Initial Depth**		ft	159 in	13.25		ft	168 in	14.00		ft		in
	Drawdown Final Depth**		ft	173 in	14.42		ft	182 in	15.17		ft		in
	Drawdown Time		min	60 sec	1		min	60 sec	1		min		sec
	Inflow Initial Depth**		ft	191 in	15.92		ft	191 in	15.92		ft		in
	Inflow Final Depth**		ft	186 in	15.50		ft	186 in	15.50		ft		in
	Fill Time		min	60 sec	1.00			60 sec	1.00		min		sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	439		gpm		439		gpm		#DIV/0!			gpm
	Inflow	157		gpm		157		gpm		#DIV/0!			gpm
	Discharge Velocity	6.76		fps		6.76		fps		#DIV/0!			fps
	Pipe Friction to Gauge	2.85		ft		2.85		ft		#DIV/0!			ft
	Pump Head	**124.6**		**ft**		**125.4**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**595**		**gpm**		**595**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

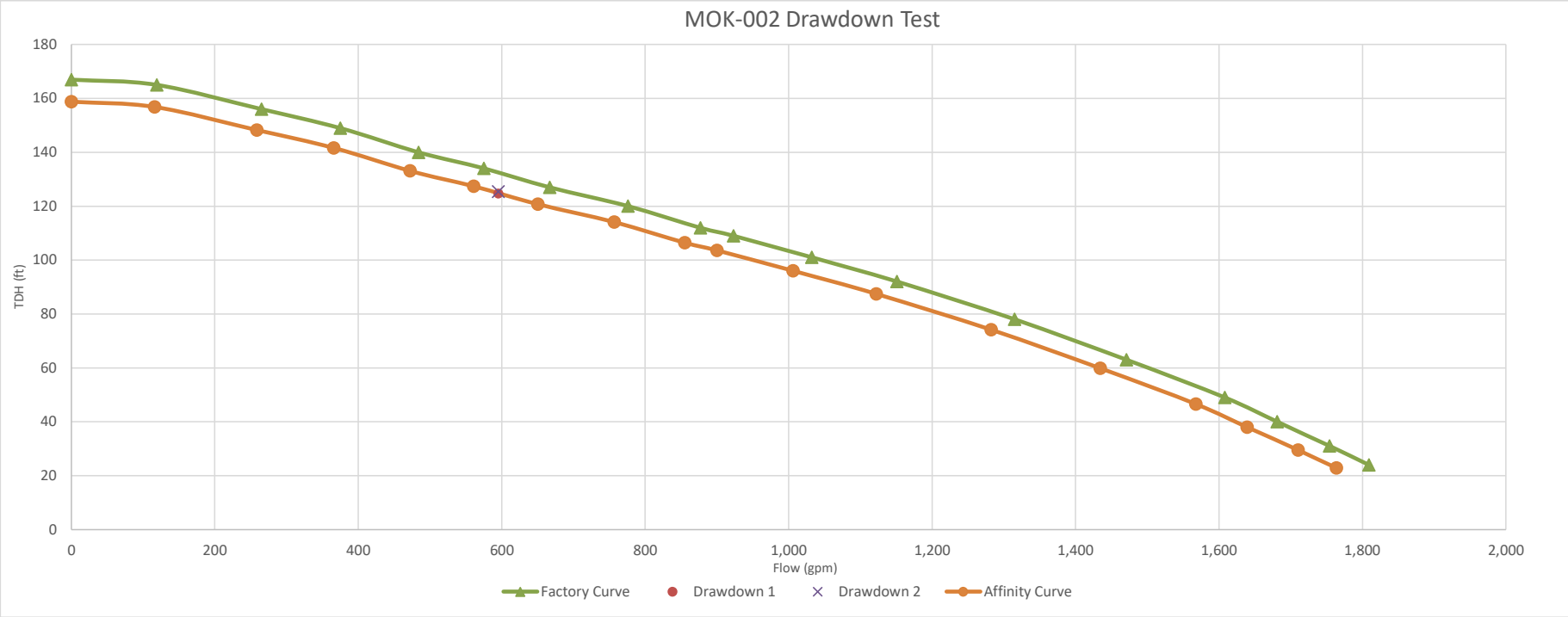
-Select input using dropdown list.

-Input used in calculations.

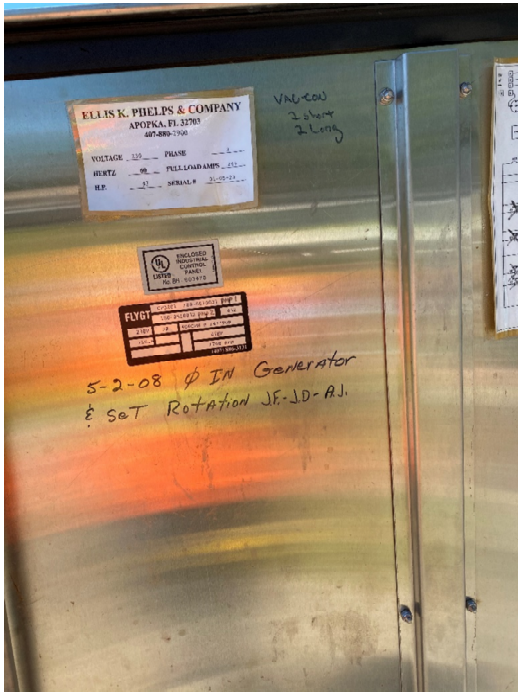
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


MOK-002 Drawdown Test
TDH (ft)
180
160
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station MOK-002
For Emergency Call
307-6000


ELLIS K. PHELPS & COMPANY
APOPKA, FL 32703
VALCON
5-2-08 Ø IN Generator
& SET Rotation

Marion County

Lift Station Drawdown Testing

Lift Station Name:	OKR-012		
Date:	4/30/2020	**Time Tested:**	10:00
Tested By:			

88 hor

Station Info	**Wetwell Φ (equivalent diameter)**	6.0	ft		**Discharge FM Φ**	6	in
	FM Length From Pump to Pressure Gauge	30	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-34	in	-2.83333333	**∑[Resistance Coeff. (K)]**	2.82	
	Wetwell Volume/ft	211.51	gal/ft				

		Pump 1			Pump 2			Pump 3		
Pump Info	**Manufacturer**	FLYGT			FLYGT					
	Model	CP 3127			CP 3127					
	Impeller		in	code 483		in	code 483		in	
	Horsepower	10			10					
Pump Test	**Static Pressure**	3	psi	6.93	4	psi	9.24		psi	
	Running Pressure	7.56	psi	17.4636	8.5	psi	19.635		psi	
	Drawdown Initial Depth**	ft 225	in	18.75	ft 233	in	19.42	ft	in	
	Drawdown Final Depth**	ft 241	in	20.08	ft 248	in	20.67	ft	in	
	Drawdown Time	min 60	sec	1	min 60	sec	1	min	sec	
	Inflow Initial Depth**	ft 231	in	19.25	ft 231	in	19.25	ft	in	
	Inflow Final Depth**	ft 224	in	18.67	ft 224	in	18.67	ft	in	
	Fill Time	min 60	sec	1.00	60	sec	1.00	min	sec	
	Measure from wet well top down to ground level		in							
	Drawdown Flow	282	gpm		264	gpm		#DIV/0!	gpm	
	Inflow	123	gpm		123	gpm		#DIV/0!	gpm	
	Discharge Velocity	4.60	fps		4.40	fps		#DIV/0!	fps	
	Pipe Friction to Gauge	1.42	ft		1.30	ft		#DIV/0!	ft	Calibrated Model Results
	Pump Head	**35.8**	**ft**		**38.4**	**ft**		**#DIV/0!**	**ft**	
	Pump Flow	**405**	**gpm**		**388**	**gpm**		**#DIV/0!**	**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

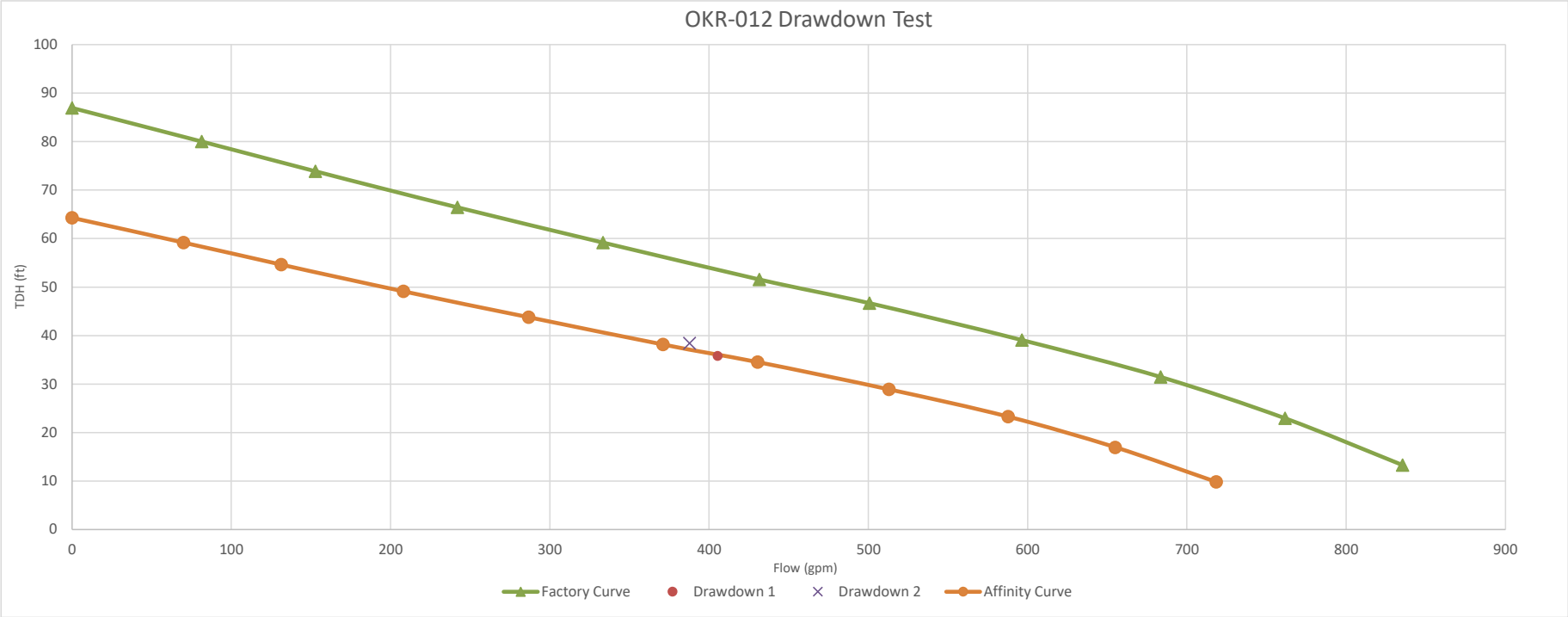
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


OKR-012 Drawdown Test
TDH (ft)
Flow (gpm)
0
10
20
30
40
50
60
70
80
90
100
0
100
200
300
400
500
600
700
800
900
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station OKR-012
For Emergency Call
307-6000

Marion County

Lift Station Drawdown Testing

Lift Station Name:	ORB-001		
Date:	4/30/2020	**Time Tested:**	8:30
Tested By:			

76 hor

Station Info							
	Wetwell Φ (equivalent diameter)	6.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	27.33	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-26	in	-2.16666667	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	211.51	gal/ft				

240 @ 102

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3153				NP 3153							
	Impeller			in	code 462			in	code 462				in
	Horsepower	20				20							
Pump Test	**Static Pressure**	12		psi	27.72	12		psi	27.72				psi
	Running Pressure	34		psi	78.54	37		psi	85.47				psi
	Drawdown Initial Depth**	ft	244	in	20.33	ft	249	in	20.75	ft			in
	Drawdown Final Depth**	ft	249	in	20.75	ft	255	in	21.25	ft			in
	Drawdown Time	min	30	sec	0.5	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	0	in	0.00	ft	0	in	0.00	ft			in
	Inflow Final Depth**	ft	0	in	0.00	ft	0	in	0.00	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	176		gpm		106		gpm		#DIV/0!			gpm
	Inflow	0		gpm		0		gpm		#DIV/0!			gpm
	Discharge Velocity	4.50		fps		2.70		fps		#DIV/0!			fps
	Pipe Friction to Gauge	1.71		ft		0.63		ft		#DIV/0!			ft
	Pump Head	**98.9**		**ft**		**105.1**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**176**		**gpm**		**106**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

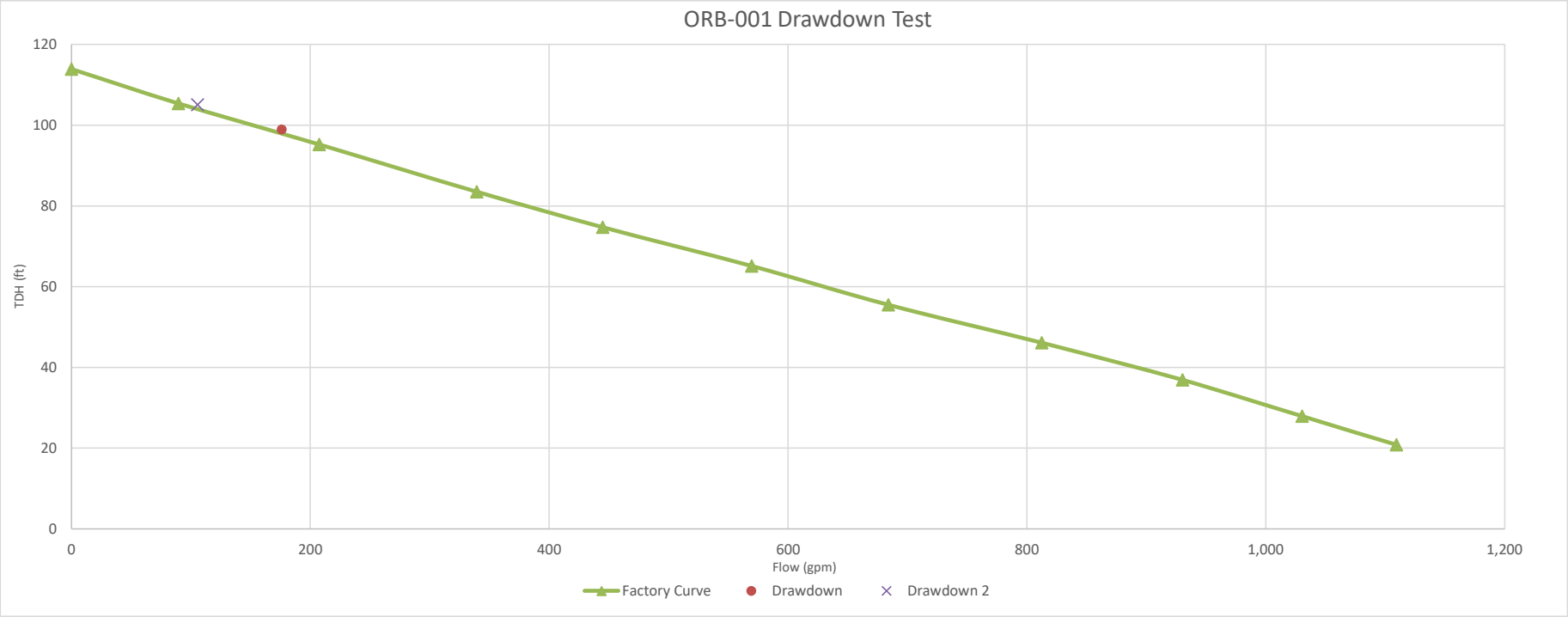
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


ORB-001 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown
Drawdown 2

ITT
ENCLOSED INDUSTRIAL CONTROL PANEL
THIS PANEL IS UL 508A LABELED
WARNING!
N-IMPELLARS!!
FLYGT

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SMG-008		
Date:	4/30/2020	**Time Tested:**	12:45
Tested By:			

hor 85

Station Info							
	Wetwell Φ (equivalent diameter)	8.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	20.54	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-28	in	-2.33333333	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	376.01	gal/ft				

157 @ 109

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3152				CP 3152							
	Impeller			in	code 487			in	code 487				in
	Horsepower	20				20							
Pump Test	**Static Pressure**	11		psi	25.41	11		psi	25.41				psi
	Running Pressure	30		psi	69.3	29		psi	66.99				psi
	Drawdown Initial Depth**		ft	136 in	11.33		ft	128 in	10.67		ft		in
	Drawdown Final Depth**		ft	141 in	11.75		ft	132.5 in	11.04		ft		in
	Drawdown Time		min	30 sec	0.5		min	30 sec	0.5		min		sec
	Inflow Initial Depth**		ft	132 in	11.00		ft	132 in	11.00		ft		in
	Inflow Final Depth**		ft	131.5 in	10.96		ft	131.5 in	10.96		ft		in
	Fill Time		min	60 sec	1.00			60 sec	1.00		min		sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	313		gpm		282		gpm		#DIV/0!			gpm
	Inflow	16		gpm		16		gpm		#DIV/0!			gpm
	Discharge Velocity	8.40		fps		7.60		fps		#DIV/0!			fps
	Pipe Friction to Gauge	5.20		ft		4.27		ft		#DIV/0!			ft
	Pump Head	**84.8**		**ft**		**80.7**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**329**		**gpm**		**298**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

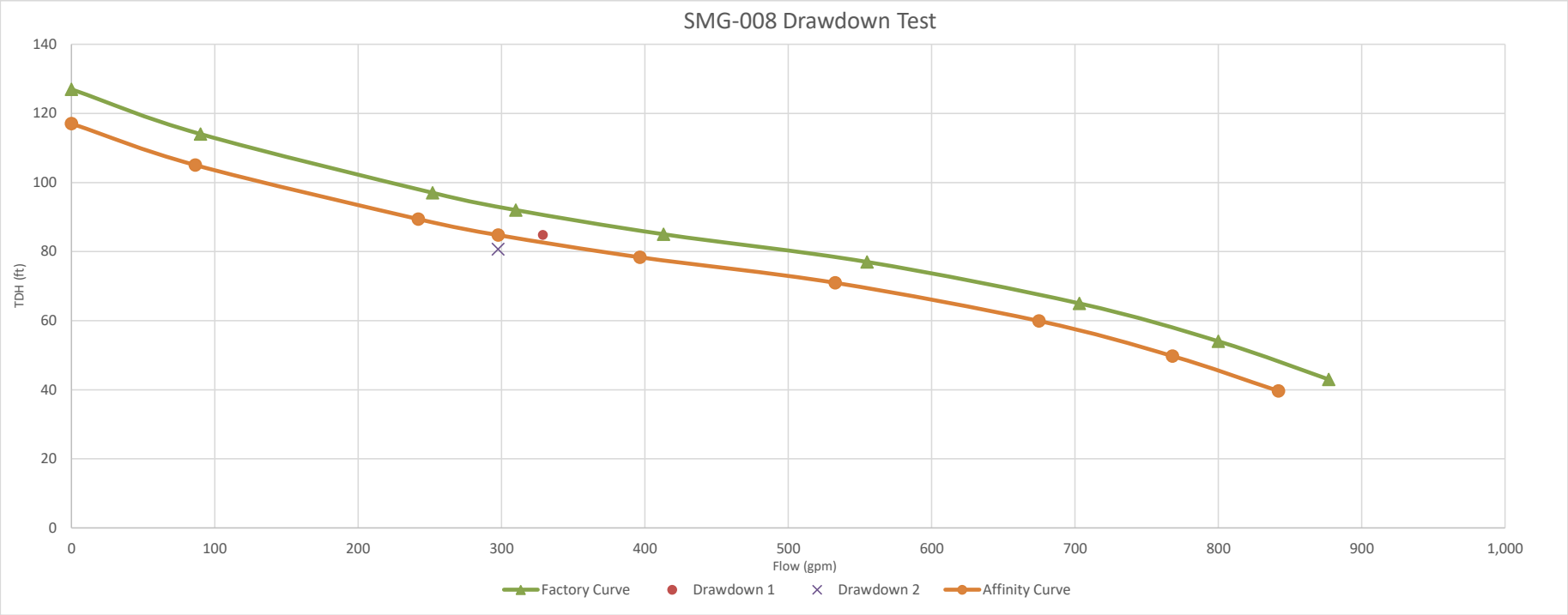
-Select input using dropdown list.

-Input used in calculations.

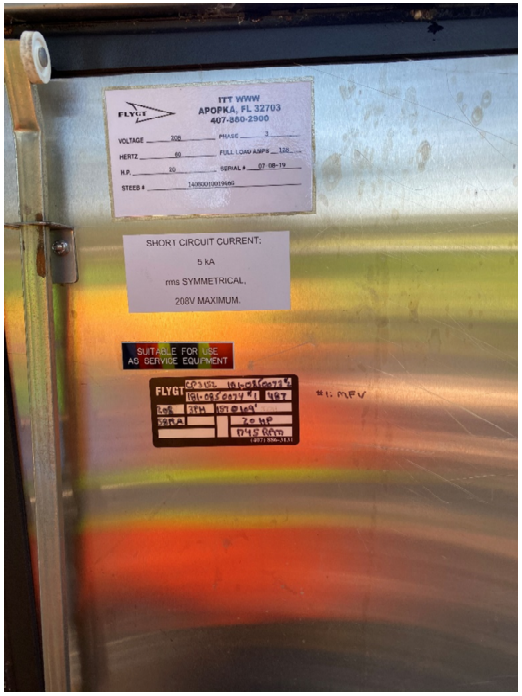
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

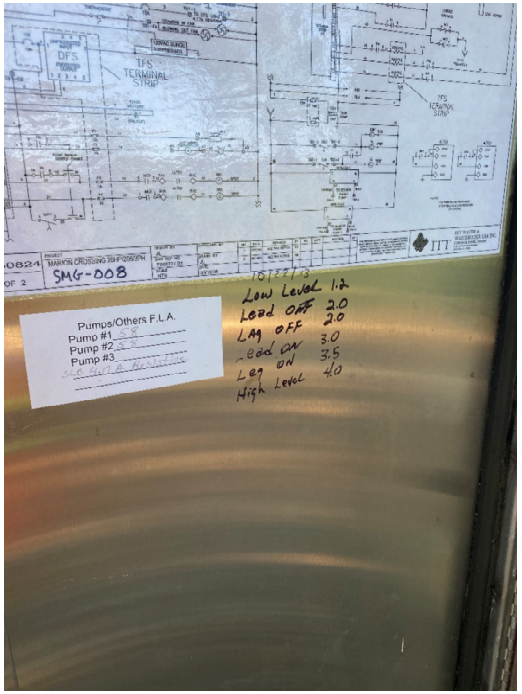
ADDITIONAL NOTES

No volute size info


SMG-008 Drawdown Test
TDH (ft)
Flow (gpm)
0
20
40
60
80
100
120
140
0
100
200
300
400
500
600
700
800
900
1,000
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station-SMG-008
For Emergency Call
307-6000


ITT WWW
APOPKA, FL 32703
407-860-2900
SHORT CIRCUIT CURRENT:
5 kA
rms SYMMETRICAL,
208V MAXIMUM.
SUITABLE FOR USE
AS SERVICE EQUIPMENT


SMG-008
Pumps/Others F.L.A.
Pump #1
Pump #2
Pump #3
Low Level 1.2
Lead OFF 2.0
Lag OFF 2.0
Lead ON 3.0
Lag ON 3.5
High Level 4.0

Marion County

Lift Station Drawdown Testing

Lift Station Name:	ASH-003		
Date:	4/28/2020	**Time Tested:**	8:30
Tested By:			

Station Info			
Wetwell Φ (equivalent diameter)	6.0	ft	
FM Length From Pump to Pressure Gauge	27	ft	
Height to Pressure Gauge*	-30	in	-2.5
Wetwell Volume/ft	211.51	gal/ft	

Discharge FM Φ	4	in
Friction "C" Factor	120	
∑[Resistance Coeff. (K)]	3.25	

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3152				CP 3152							
	Impeller			in	code 487			in	code 487			in	
	Horsepower	20				20							
Pump Test	**Static Pressure**	30		psi	69.3	30		psi	69.3			psi	
	Running Pressure	32		psi	73.92	33		psi	76.23			psi	
	Drawdown Initial Depth**	ft	265.5	in	22.13	ft	276	in	23.00	ft		in	
	Drawdown Final Depth**	ft	278	in	23.17	ft	284	in	23.67	ft		in	
	Drawdown Time	1 min		sec	1	min	30	sec	0.5	min		sec	
	Inflow Initial Depth**	ft	261	in	21.75	ft	261	in	21.75	ft		in	
	Inflow Final Depth**	ft	260.5	in	21.71	ft	260.5	in	21.71	ft		in	
	Fill Time	min	30	sec	0.50		30	sec	0.50	min		sec	
	Measure from wet well top down to ground level			in									
	Drawdown Flow	220		gpm		282		gpm		#DIV/0!		gpm	
	Inflow	18		gpm		18		gpm		#DIV/0!		gpm	
	Discharge Velocity	6.08		fps		7.65		fps		#DIV/0!		fps	
	Pipe Friction to Gauge	3.04		ft		4.76		ft		#DIV/0!		ft	Calibrated Model Results
	Pump Head	**97.7**		**ft**		**102.7**		**ft**		**#DIV/0!**		**ft**	
	Pump Flow	**238**		**gpm**		**300**		**gpm**		**#DIV/0!**		**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

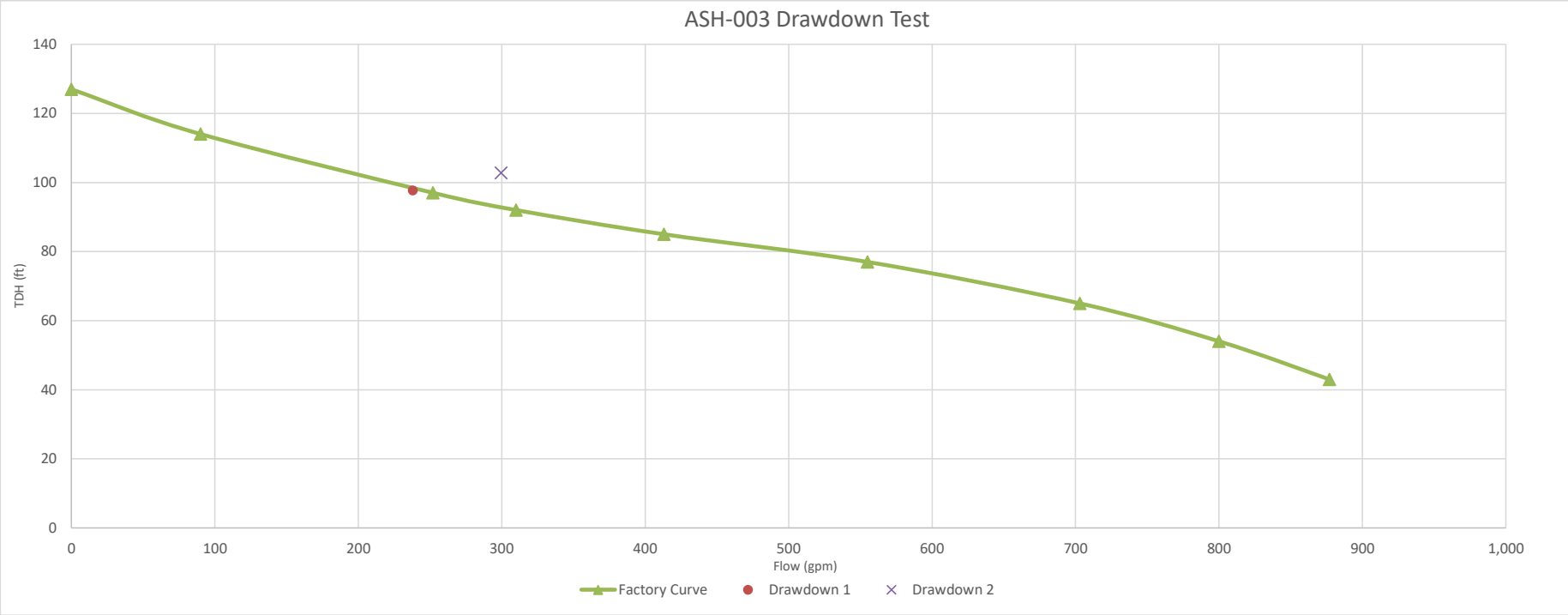
-Select input using dropdown list.

-Input used in calculations.

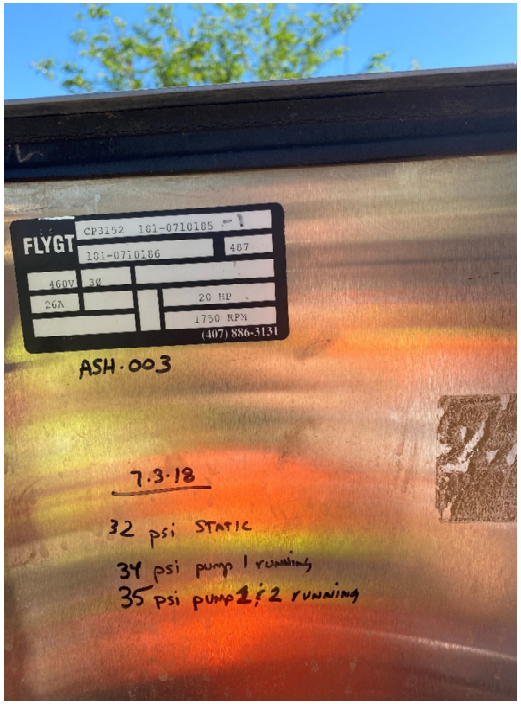
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute pump 1
Existing pressure valve at station may be innaccurate


ASH-003 Drawdown Test
TDH (ft)
140
120
100
80
60
40
20
0
0
100
200
300
400
500
600
700
800
900
1,000
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

LIFT
STATION
ASH-003


FLYGT
CP3152 181-0710185
181-0710186
467
460V 3Ø
26A
20 HP
1750 RPM
(407) 886-3131
ASH-003
7.3.18
32 psi STATIC
34 psi pump 1 running
35 psi pump 1 & 2 running

Marion County

Lift Station Drawdown Testing

Lift Station Name:	ASH-002		
Date:	4/28/2020	**Time Tested:**	11:00
Tested By:			

Station Info			
Wetwell Φ (equivalent diameter)	8.0	ft	
FM Length From Pump to Pressure Gauge	24.833	ft	
Height to Pressure Gauge*	-24	in	-2
Wetwell Volume/ft	376.01	gal/ft	

Discharge FM Φ	6	in
Friction "C" Factor	120	
∑[Resistance Coeff. (K)]	2.82	

		Pump 1			Pump 2			Pump 3		
Pump Info	**Manufacturer**	FLYGT			FLYGT					
	Model	CP 3170			CP 3170					
	Impeller		in	code 464		in	code 464		in	
	Horsepower	30			30					
Pump Test	**Static Pressure**	32	psi	73.92	32	psi	73.92		psi	
	Running Pressure	36	psi	83.16	36	psi	83.16		psi	
	Drawdown Initial Depth**	ft 255	in	21.25	ft 251	in	20.92	ft	in	
	Drawdown Final Depth**	ft 258.5	in	21.54	ft 258	in	21.50	ft	in	
	Drawdown Time	min 30	sec	0.5	min 30	sec	0.5	min	sec	
	Inflow Initial Depth**	ft 248	in	20.67	ft 248	in	20.67	ft	in	
	Inflow Final Depth**	ft 247	in	20.58	ft 247	in	20.58	ft	in	
	Fill Time	min 60	sec	1.00	60	sec	1.00	min	sec	
	Measure from wet well top down to ground level		in							
	Drawdown Flow	219	gpm		439	gpm		#DIV/0!	gpm	
	Inflow	31	gpm		31	gpm		#DIV/0!	gpm	
	Discharge Velocity	2.84	fps		5.33	fps		#DIV/0!	fps	
	Pipe Friction to Gauge	0.52	ft		1.78	ft		#DIV/0!	ft	Calibrated Model Results
	Pump Head	**103.2**	**ft**		**104.6**	**ft**		**#DIV/0!**	**ft**	
	Pump Flow	**251**	**gpm**		**470**	**gpm**		**#DIV/0!**	**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

-Select input using dropdown list.

-Input used in calculations.

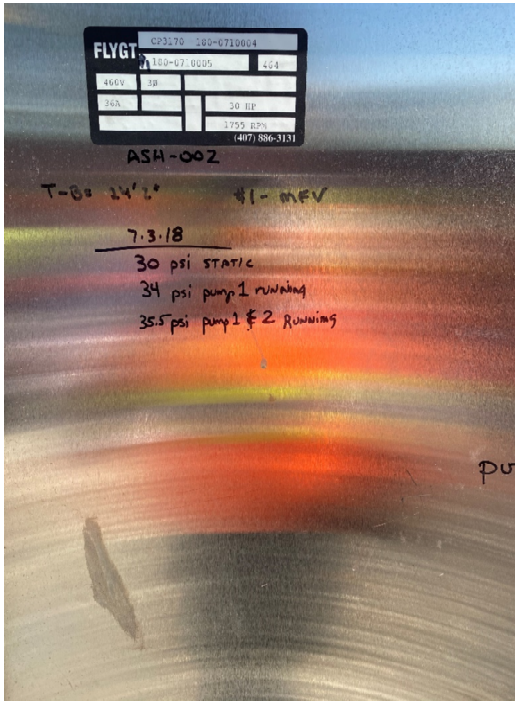
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

6" volute pump 1
Over 10psi of air buildup in line and pumps were air locked

ASH-002 Drawdown Test
TDH (ft)
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
LIFT
STATION
ASH-002
3715 NW 55TH AVE
FOR EMERGENCY CALL
307-6000


FLYGT
(407) 886-3131
ASH-002
7.3.18
30 psi STATIC
34 psi pump 1 running
35.5 psi pump 1 & 2 Running

Marion County

Lift Station Drawdown Testing

Lift Station Name:	ASH-005		
Date:	4/28/2020	**Time Tested:**	10:00
Tested By:			

Station Info			
Wetwell Φ (equivalent diameter)	8.0	ft	
FM Length From Pump to Pressure Gauge	28.833	ft	
Height to Pressure Gauge*	-12	in	-1
Wetwell Volume/ft	376.01	gal/ft	

Discharge FM Φ	6	in
Friction "C" Factor	120	
∑[Resistance Coeff. (K)]	2.82	

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	Flygt				Flygt							
	Model	np3202				np3202							
	Impeller			in	468			in	468				in
	Horsepower	45				45							
Pump Test	**Static Pressure**	32		psi	73.92	32		psi	73.92				psi
	Running Pressure	44		psi	101.64	44		psi	101.64				psi
	Drawdown Initial Depth**		ft	230.5 in	19.21		ft	245.5 in	20.46		ft		in
	Drawdown Final Depth**		ft	246 in	20.50		ft	262.5 in	21.88		ft		in
	Drawdown Time		min	60 sec	1		min	60 sec	1		min		sec
	Inflow Initial Depth**		ft	232 in	19.33		ft	232 in	19.33		ft		in
	Inflow Final Depth**		ft	231.5 in	19.29		ft	231.5 in	19.29		ft		in
	Fill Time		min	60 sec	1.00			60 sec	1.00		min		sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	486		gpm		533		gpm		#DIV/0!			gpm
	Inflow	16		gpm		16		gpm		#DIV/0!			gpm
	Discharge Velocity	5.69		fps		6.22		fps		#DIV/0!			fps
	Pipe Friction to Gauge	2.11		ft		2.52		ft		#DIV/0!			ft
	Pump Head	**123.1**		**ft**		**124.9**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**501**		**gpm**		**548**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

-Select input using dropdown list.

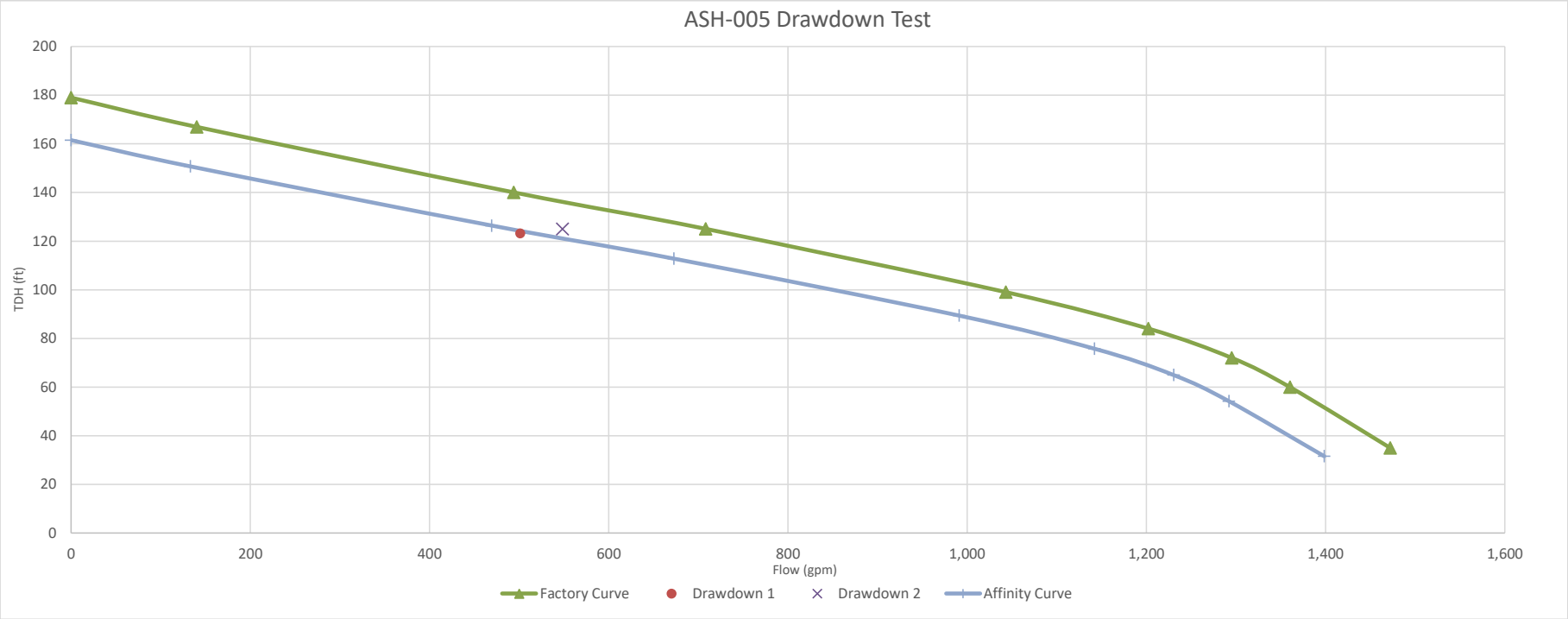
-Input used in calculations.

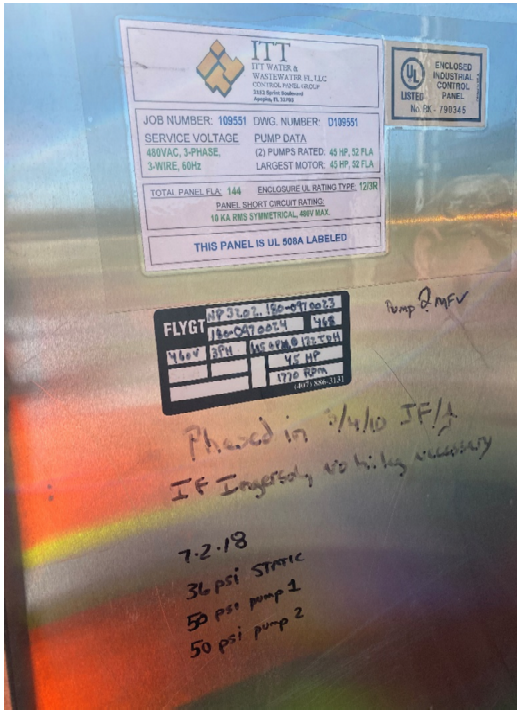
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

No information available

Initial pump test written on LS door was 615 gpm @132 ft head


ASH-005 Drawdown Test
TDH (ft)
Flow (gpm)
0
20
40
60
80
100
120
140
160
180
200
0
200
400
600
800
1,000
1,200
1,400
1,600
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve


ITT
JOB NUMBER: 109551
DWG. NUMBER: D109551
SERVICE VOLTAGE
480VAC, 3-PHASE, 3-WIRE, 60Hz
PUMP DATA
(2) PUMPS RATED: 45 HP, 52 FLA
LARGEST MOTOR: 45 HP, 52 FLA
TOTAL PANEL FLA: 144
ENCLOSURE UL RATING TYPE: 12/3R
PANEL SHORT CIRCUIT RATING:
10 KA RMS SYMMETRICAL, 480V MAX.
THIS PANEL IS UL 508A LABELED
ENCLOSED INDUSTRIAL CONTROL PANEL
FLYGT
45 HP
1770 RPM
Pump 2 MFV
Placed in 3/4/10 JF/A
If Imperfect, no hitting necessary
7.2.18
36 psi Static
50 psi pump 1
50 psi pump 2

MARION COUNTY UTILITIES
Lift Station ASH-005
For Emergency Call
307-6000

Marion County

Lift Station Drawdown Testing

Lift Station Name:	PLT-001		
Date:	4/28/2020	**Time Tested:**	8:30
Tested By:			

Station Info	**Wetwell Φ (equivalent diameter)**	12.0	ft		**Discharge FM Φ**	6	in
	FM Length From Pump to Pressure Gauge	25.833	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-36	in	-3	**∑[Resistance Coeff. (K)]**	2.82	
	Wetwell Volume/ft	846.02	gal/ft				

		Pump 1				Pump 2				Pump 3				
Pump Info	**Manufacturer**	FLYGT				FLYGT				OPEN SLOT				
	Model	NP 3153				NP 3153				NP 3153				
	Impeller			in	code 464			in	code 464			in	code 464	
	Horsepower	15				15				15				
Pump Test	**Static Pressure**	12		psi	27.72	12		psi	27.72			psi		
	Running Pressure	21		psi	48.51	21		psi	48.51			psi		
	Drawdown Initial Depth**	ft	170	in	14.17	ft	173	in	14.42	ft		in		
	Drawdown Final Depth**	ft	177	in	14.75	ft	180.5	in	15.04	ft		in		
	Drawdown Time	min	60	sec	1	min	60	sec	1	min		sec		
	Inflow Initial Depth**	ft	180.5	in	15.04	ft	180.5	in	15.04	ft		in		
	Inflow Final Depth**	ft	180	in	15.00	ft	180	in	15.00	ft		in		
	Fill Time	min	60	sec	1.00		60	sec	1.00	min		sec		
	Measure from wet well top down to ground level			in										
	Drawdown Flow	494		gpm		529		gpm		#DIV/0!		gpm		
	Inflow	35		gpm		35		gpm		#DIV/0!		gpm		
	Discharge Velocity	6.00		fps		6.40		fps		#DIV/0!		fps		
	Pipe Friction to Gauge	2.26		ft		2.57		ft		#DIV/0!		ft	Calibrated Model Results	
	Pump Head	**62.8**		**ft**		**63.4**		**ft**		**#DIV/0!**		**ft**		
	Pump Flow	**529**		**gpm**		**564**		**gpm**		**#DIV/0!**		**gpm**		

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

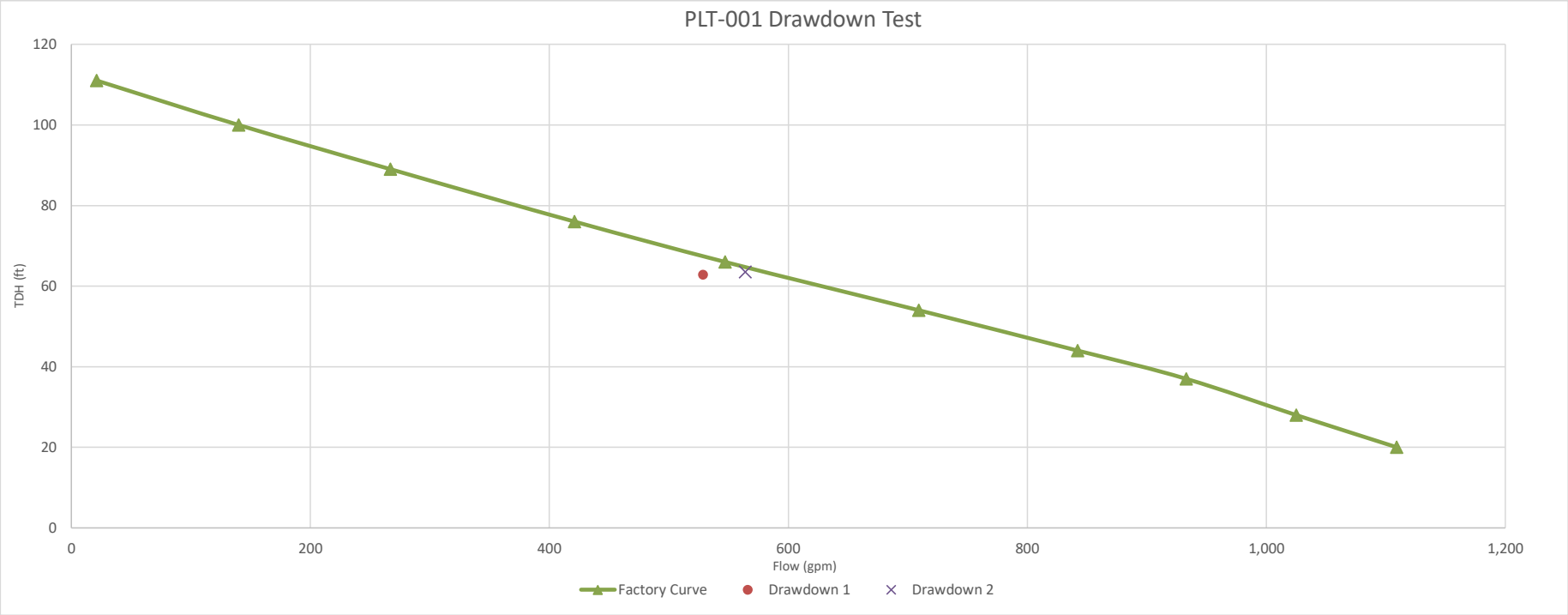
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute pumps 1 and 2
Initial pump test written on LS door was 405 gpm @76.6 ft head


PLT-001 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

MARION COUNTY UTILITIES
Lift Station- PLT-001
For Emergency Call
307-6000

HICARB

FLYGT
(407) 886-3131

Marion County

Lift Station Drawdown Testing

Lift Station Name:	KUN-002		
Date:	4/28/2020	**Time Tested:**	9:30
Tested By:			

Station Info			
Wetwell Φ (equivalent diameter)	6.0	ft	
FM Length From Pump to Pressure Gauge	25.666	ft	
Height to Pressure Gauge*	-24	in	
Wetwell Volume/ft	211.51	gal/ft	

Discharge FM Φ	4	in
Friction "C" Factor	120	
-2 **∑[Resistance Coeff. (K)]**	3.25	

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	Flygt											
	Model	np3153											
	Impeller			in	464			in				in	
	Horsepower	15											
Pump Test	**Static Pressure**	14		psi	32.34			psi	0			psi	
	Running Pressure	25		psi	57.75			psi	0			psi	
	Drawdown Initial Depth**	ft	220.5	in	18.38	ft		in	0.00	ft		in	
	Drawdown Final Depth**	ft	233.5	in	19.46	ft		in	0.00	ft		in	
	Drawdown Time	min	60	sec	1	min		sec	0	min		sec	
	Inflow Initial Depth**	ft	221	in	18.42	ft		in	0.00	ft		in	
	Inflow Final Depth**	ft	220.5	in	18.38	ft		in	0.00	ft		in	
	Fill Time	min	60	sec	1.00			sec	0.00	min		sec	
	Measure from wet well top down to ground level			in									
	Drawdown Flow	229		gpm		#DIV/0!		gpm		#DIV/0!		gpm	
	Inflow	9		gpm		#DIV/0!		gpm		#DIV/0!		gpm	
	Discharge Velocity	6.08		fps		#DIV/0!		fps		#DIV/0!		fps	
	Pipe Friction to Gauge	2.98		ft		#DIV/0!		ft		#DIV/0!		ft	Calibrated Model Results
	Pump Head	**78.2**		**ft**		**#DIV/0!**		**ft**		**#DIV/0!**		**ft**	
	Pump Flow	**238**		**gpm**		**#DIV/0!**		**gpm**		**#DIV/0!**		**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

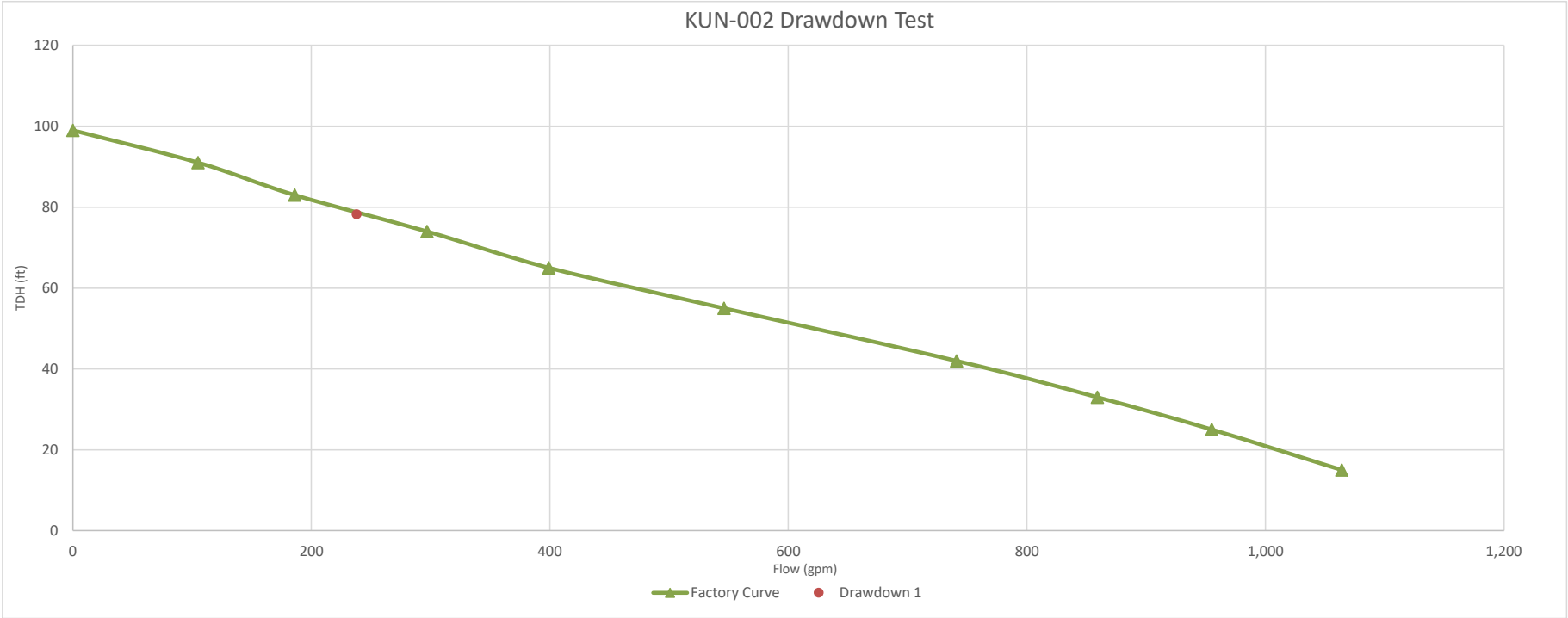
-Select input using dropdown list.

-Input used in calculations.

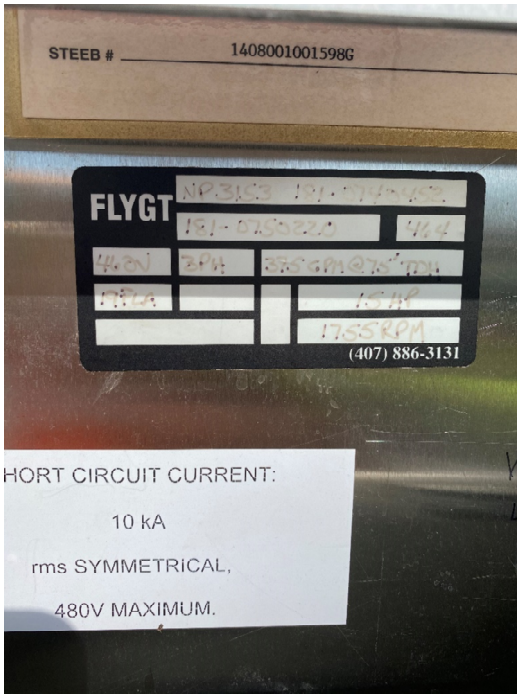
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

No information available
Initial pump test written on LS door was 375 gpm @75 ft head
Not enough depth for 2nd test with no way to add flow to LS


KUN-002 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown 1

MARION COUNTY UTILITIES
Lift Station-KUN-G01
For Emergency Call
307-6000


STEEB # 1408001001598G
FLYGT
(407) 886-3131
HORT CIRCUIT CURRENT:
10 kA
rms SYMMETRICAL,
480V MAXIMUM.

Marion County

Lift Station Drawdown Testing

Lift Station Name:	STC-001 (North Valley)		
Date:	4/30/2020	**Time Tested:**	1:30
Tested By:	Mylene, Mike, Erik, Addison, TJ		

82 hor 22 vert

Station Info							
	Wetwell Φ (equivalent diameter)	8.0	ft		**Discharge FM Φ**	6	in
	FM Length From Pump to Pressure Gauge	24.5	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-22	in	-1.83333333	**∑[Resistance Coeff. (K)]**	2.82	
	Wetwell Volume/ft	376.01	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3152				CP 3152							
	Impeller			in	code 454			in	code 454				in
	Horsepower	20				20							
Pump Test	**Static Pressure**	31		psi	71.61	31		psi	71.61				psi
	Running Pressure	37		psi	85.47	37		psi	85.47				psi
	Drawdown Initial Depth**		ft	202 in	16.83		ft	209 in	17.42		ft		in
	Drawdown Final Depth**		ft	211 in	17.58		ft	216.5 in	18.04		ft		in
	Drawdown Time		min	60 sec	1		min	60 sec	1		min		sec
	Inflow Initial Depth**		ft	210 in	17.50		ft	210 in	17.50		ft		in
	Inflow Final Depth**		ft	208 in	17.33		ft	208 in	17.33		ft		in
	Fill Time		min	60 sec	1.00			60 sec	1.00		min		sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	282		gpm		235		gpm		#DIV/0!			gpm
	Inflow	63		gpm		63		gpm		#DIV/0!			gpm
	Discharge Velocity	3.91		fps		3.38		fps		#DIV/0!			fps
	Pipe Friction to Gauge	0.97		ft		0.72		ft		#DIV/0!			ft
	Pump Head	**102.0**		**ft**		**102.3**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**345**		**gpm**		**298**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

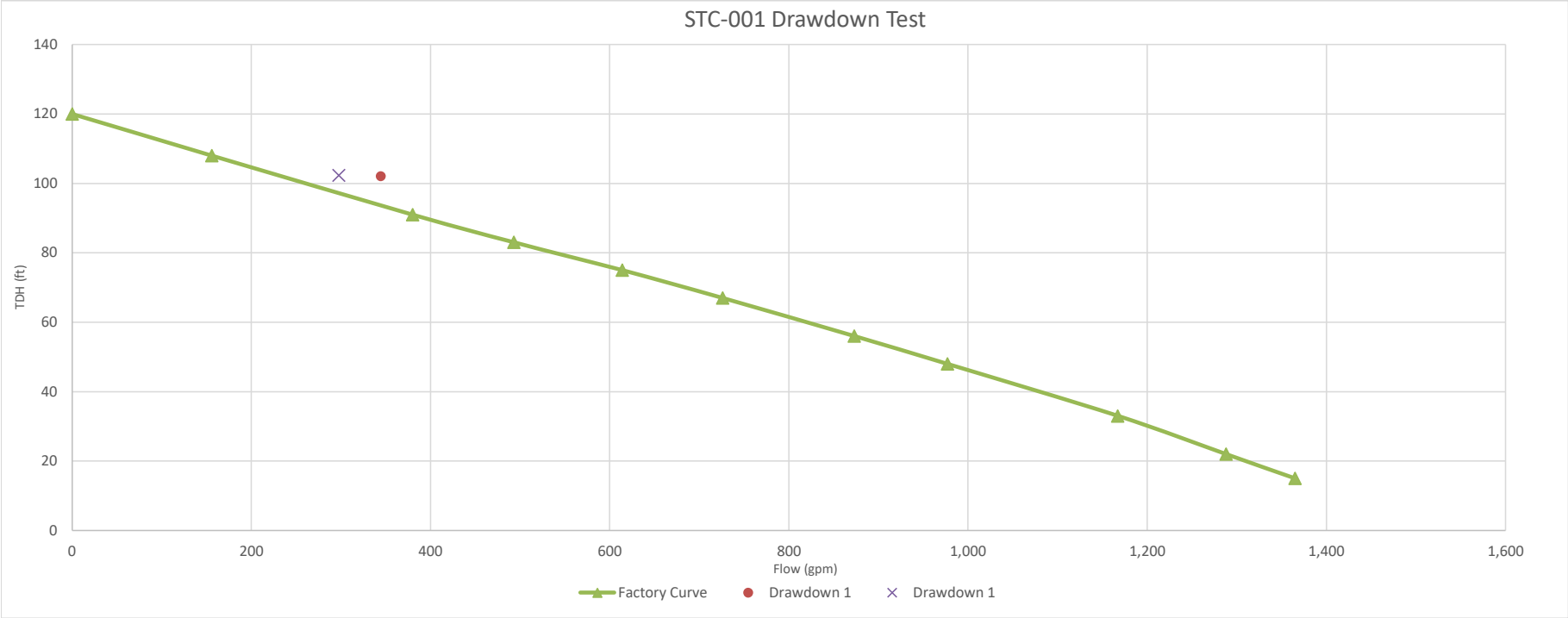
-Select input using dropdown list.

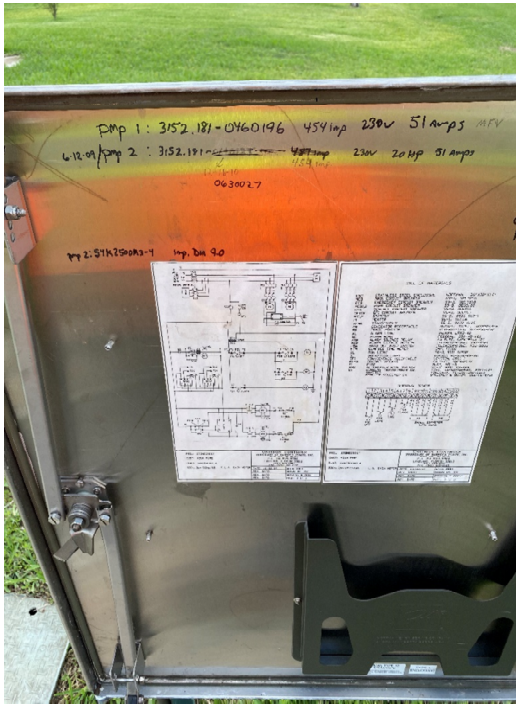
-Input used in calculations.

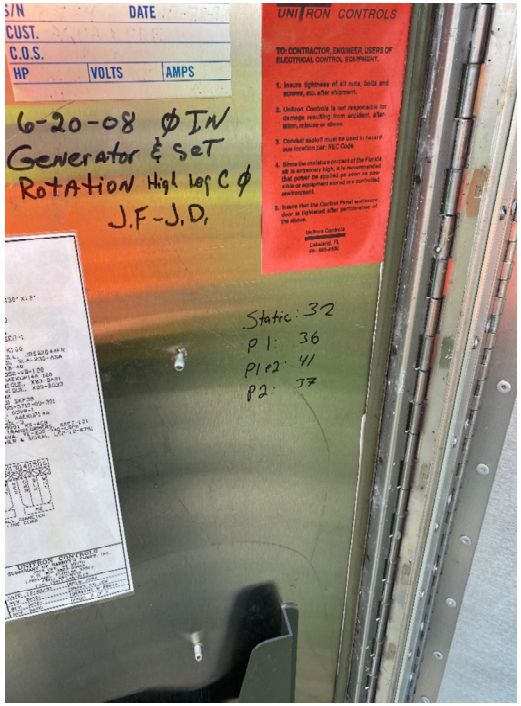
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size
Lots of Water Hammering Present after shutting off pumps


STC-001 Drawdown Test
TDH (ft)
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 1


Pump 1 : 3152.181-0460196 454 hp 230v 51 Amps
6-12-09 Pump 2 : 3152.191 230v 20 hp 51 amps
0630027


DATE
CUST.
C.O.S.
HP
VOLTS
AMPS
UNIFIRON CONTROLS
6-20-08 ØIN
Generator & set
Rotation High leg C Ø
J.F-J.D.
Static: 32
P1: 36
P1+2: 41
P2: 37

Marion County

Lift Station Drawdown Testing

Lift Station Name:	TCR-001 (Track & Card Room)		
Date:	4/30/2020	**Time Tested:**	8:30
Tested By:	Mylene, Mike, Erik, Addison, TJ		36 in vert 125 in hor

Station Info	**Wetwell Φ (equivalent diameter)**	6.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	21.4	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-36	in	-3	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	211.51	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3153				NP 3153							
	Impeller			in	code 275			in	code 275				in
	Horsepower	23				23							
Pump Test	**Static Pressure**	62		psi	143.22	61		psi	140.91				psi
	Running Pressure	70		psi	161.7	70		psi	161.7				psi
	Drawdown Initial Depth**		ft	123 in	10.25		ft	130.5 in	10.88		ft		in
	Drawdown Final Depth**		ft	130 in	10.83		ft	137 in	11.42		ft		in
	Drawdown Time		min	60 sec	1		min	60 sec	1		min		sec
	Inflow Initial Depth**		ft	0 in	0.00		ft	0 in	0.00		ft		in
	Inflow Final Depth**		ft	0 in	0.00		ft	0 in	0.00		ft		in
	Fill Time		min	60 sec	1.00			60 sec	1.00		min		sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	123		gpm		115		gpm		#DIV/0!			gpm
	Inflow	0		gpm		0		gpm		#DIV/0!			gpm
	Discharge Velocity	3.15		fps		2.93		fps		#DIV/0!			fps
	Pipe Friction to Gauge	0.78		ft		0.67		ft		#DIV/0!			ft
	Pump Head	**170.2**		**ft**		**170.7**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**123**		**gpm**		**115**		**gpm**		**#DIV/0!**			**gpm**

they know its bad
other psi gauge static was 42

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

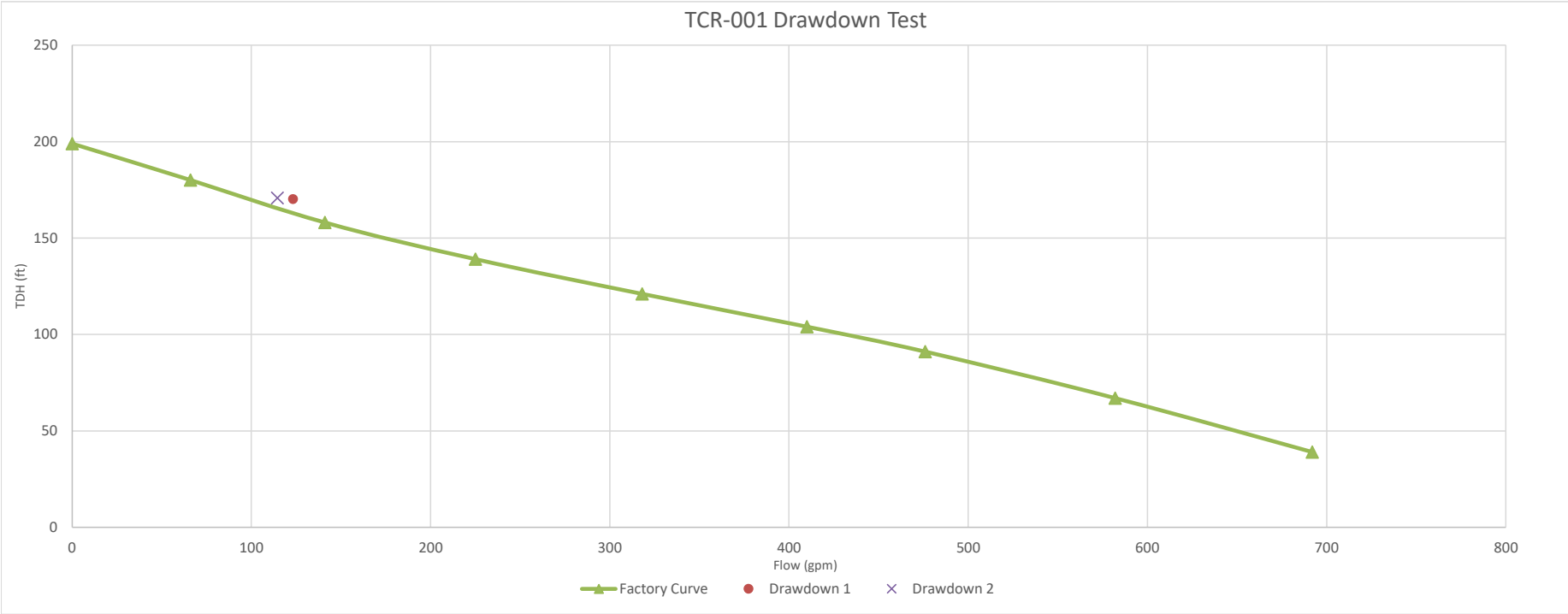
-Select input using dropdown list.

-Input used in calculations.

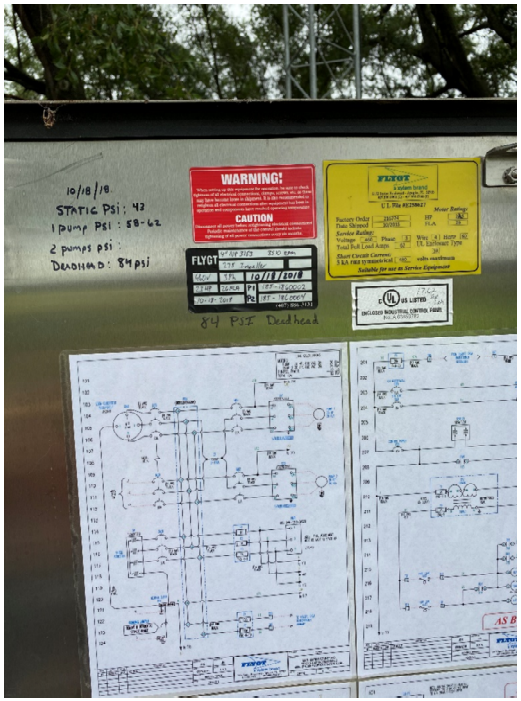
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


TCR-001 Drawdown Test
TDH (ft)
250
200
150
100
50
0
0
100
200
300
400
500
600
700
800
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

Track & Card
Room Phase 2
OPEN


10/18/18
STATIC PSI: 42
1 pump PSI: 58-62
2 pumps psi:
DEADHEAD: 84psi
WARNING!
CAUTION
84 PSI Deadhead

Marion County

Lift Station Drawdown Testing

Lift Station Name:	STC-012 (Soulliere Villas)		
Date:	4/30/2020	**Time Tested:**	9:15
Tested By:	Mylene, Mike, Erik, Addison, TJ		

132 30

Station Info	**Wetwell Φ (equivalent diameter)**	10.0	ft		**Discharge FM Φ**	6	in
	FM Length From Pump to Pressure Gauge	29.666	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-30	in	-2.5	**∑[Resistance Coeff. (K)]**	2.82	
	Wetwell Volume/ft	587.52	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3202				NP 3202							
	Impeller			in	code 468			in	code 468			in	
	Horsepower	45				45							
Pump Test	**Static Pressure**	48		psi	110.88	50		psi	115.5			psi	
	Running Pressure	56		psi	129.36	56		psi	129.36			psi	
	Drawdown Initial Depth**	ft	253	in	21.08	ft	256	in	21.33	ft		in	
	Drawdown Final Depth**	ft	256	in	21.33	ft	263	in	21.92	ft		in	
	Drawdown Time	min	30	sec	0.5	min	60	sec	1	min		sec	
	Inflow Initial Depth**	ft	254	in	21.17	ft	254	in	21.17	ft		in	
	Inflow Final Depth**	ft	254.3	in	21.19	ft	254.3	in	21.19	ft		in	
	Fill Time	min	60	sec	1.00		60	sec	1.00	min		sec	
	Measure from wet well top down to ground level			in									
	Drawdown Flow	294		gpm		343		gpm		#DIV/0!		gpm	
	Inflow	-12		gpm		-12		gpm		#DIV/0!		gpm	
	Discharge Velocity	3.19		fps		3.75		fps		#DIV/0!		fps	
	Pipe Friction to Gauge	0.69		ft		0.95		ft		#DIV/0!		ft	Calibrated Model Results
	Pump Head	**148.9**		**ft**		**149.7**		**ft**		**#DIV/0!**		**ft**	
	Pump Flow	**282**		**gpm**		**330**		**gpm**		**#DIV/0!**		**gpm**	

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

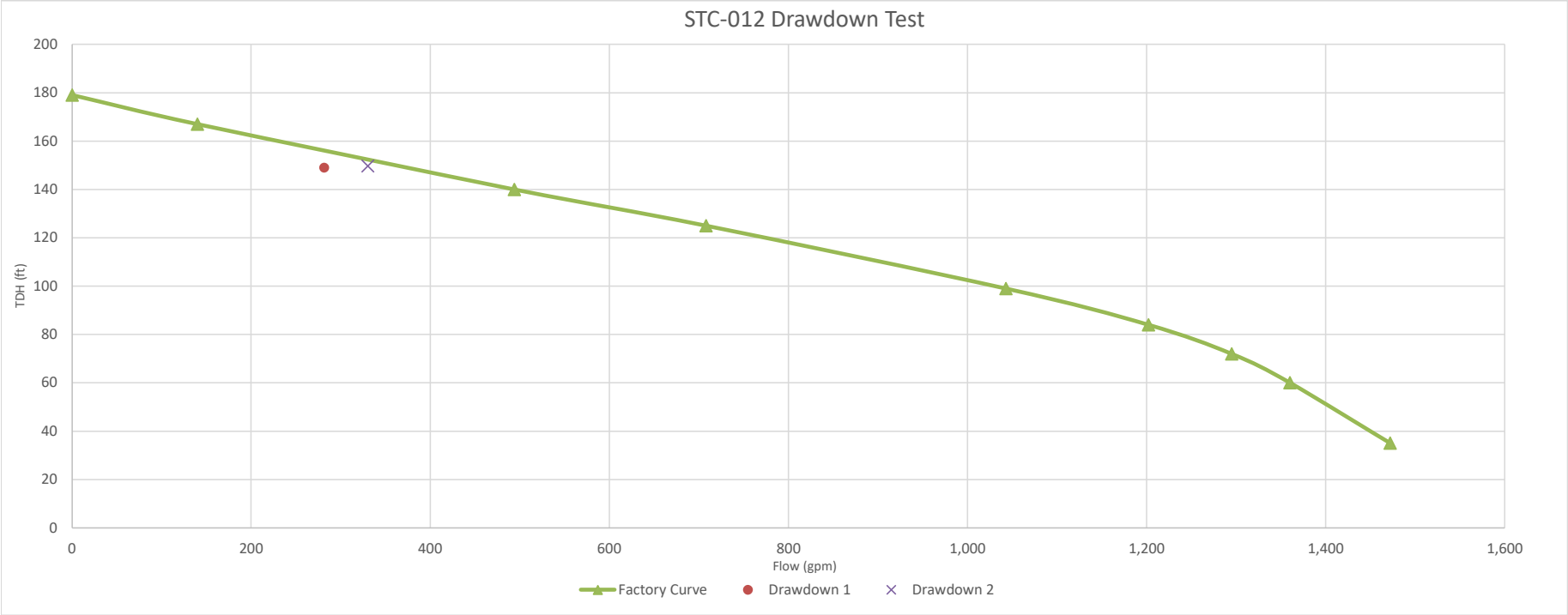
-Select input using dropdown list.

-Input used in calculations.

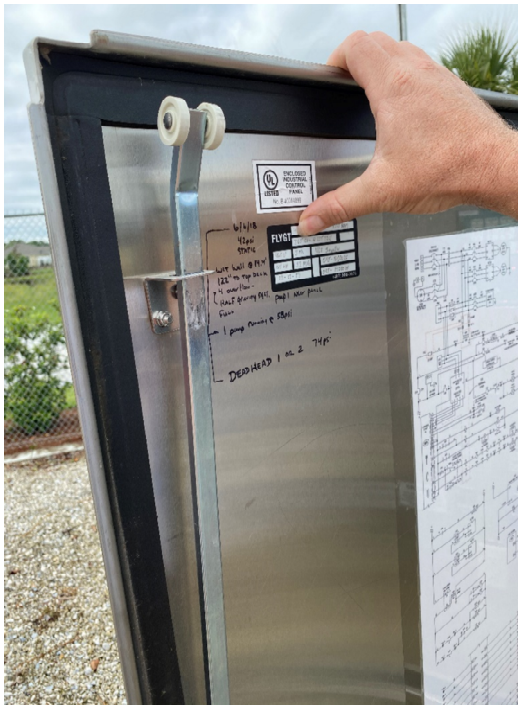
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


STC-012 Drawdown Test
TDH (ft)
200
180
160
140
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

MARION COUNTY UTILITIES
LIFT STATION - STC-012
FOR EMERGENCY CALL
352-307-4000



Marion County

Lift Station Drawdown Testing

Lift Station Name:	STC-004 (Enclave)		
Date:	4/30/2020	**Time Tested:**	2:00
Tested By:	Mylene, Mike, Erik, Addison, TJ		

90 hor 0 vert

Station Info			
Wetwell Φ (equivalent diameter)	6.0	ft	
FM Length From Pump to Pressure Gauge	22.4	ft	
Height to Pressure Gauge*	0	in	0
Wetwell Volume/ft	211.51	gal/ft	

Discharge FM Φ	4	in
Friction "C" Factor	120	
∑[Resistance Coeff. (K)]	3.25	

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3153				NP 3153							
	Impeller			in	code 463			in	code 463				in
	Horsepower	20				20							
Pump Test	**Static Pressure**	30		psi	69.3	30		psi	69.3				psi
	Running Pressure	36		psi	83.16	33		psi	76.23				psi
	Drawdown Initial Depth**	ft	144.5	in	12.04	ft	149	in	12.42	ft			in
	Drawdown Final Depth**	ft	150	in	12.50	ft	155	in	12.92	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	155	in	12.92	ft	155	in	12.92	ft			in
	Inflow Final Depth**	ft	150.5	in	12.54	ft	150.5	in	12.54	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	97		gpm		106		gpm		#DIV/0!			gpm
	Inflow	79		gpm		79		gpm		#DIV/0!			gpm
	Discharge Velocity	4.50		fps		4.73		fps		#DIV/0!			fps
	Pipe Friction to Gauge	1.58		ft		1.74		ft		#DIV/0!			ft
	Pump Head	**97.3**		**ft**		**91.0**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**176**		**gpm**		**185**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

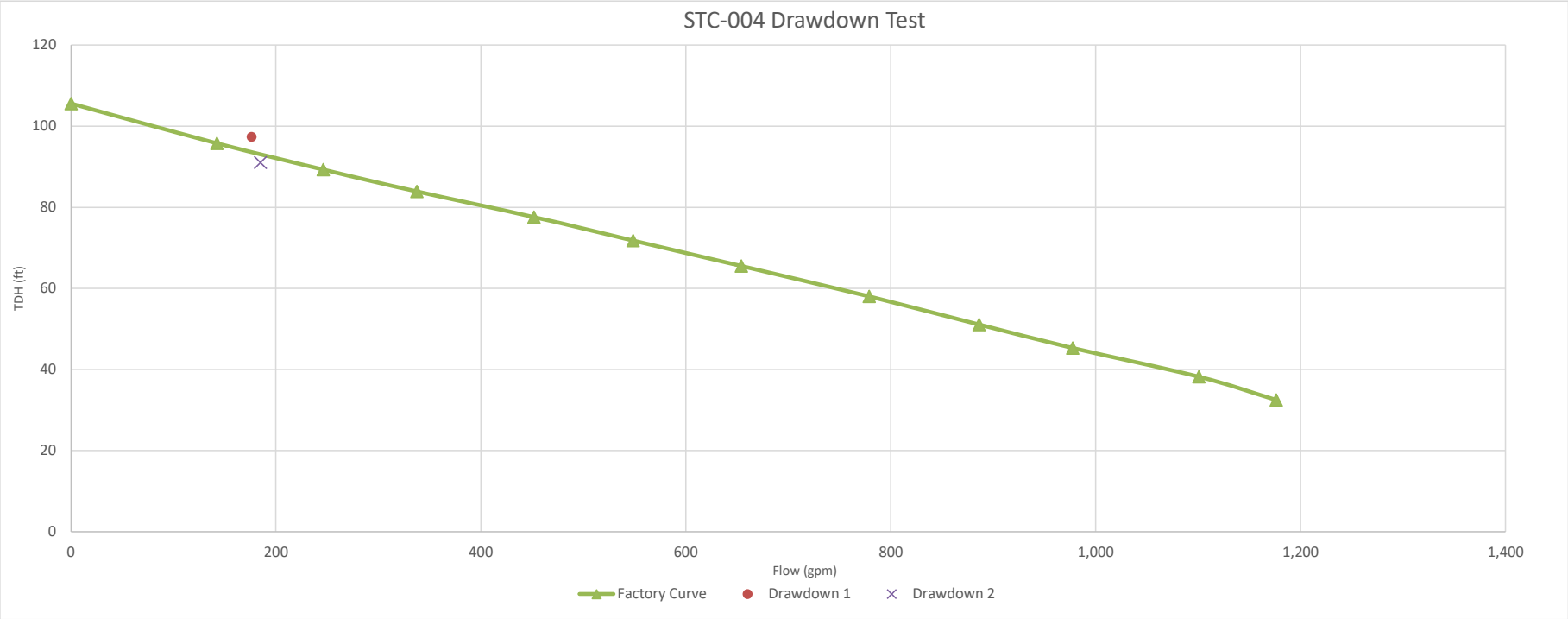
-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


STC-004 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

4
MARION COUNTY UTILITIES
Lift Station-
For Emergency Call
307-6000

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SCS-001		
Date:	4/30/2020	**Time Tested:**	11:30
Tested By:	Mylene, Mike, Erik, Addison, TJ		

102 hc 16 vert

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	19.5	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-16	in	-1.33333333	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	376.01	gal/ft				

120 @ 67

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	CP 3127				CP 3127							
	Impeller			in	code 484			in	code 484				in
	Horsepower	10				10							
Pump Test	**Static Pressure**	8		psi	18.48	8		psi	18.48				psi
	Running Pressure	24		psi	55.44	24		psi	55.44				psi
	Drawdown Initial Depth**	ft	157	in	13.08	ft	160.5	in	13.38	ft			in
	Drawdown Final Depth**	ft	160.5	in	13.38	ft	164.5	in	13.71	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	157	in	13.08	ft	157	in	13.08	ft			in
	Inflow Final Depth**	ft	157	in	13.08	ft	157	in	13.08	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	110		gpm		125		gpm		#DIV/0!			gpm
	Inflow	0		gpm		0		gpm		#DIV/0!			gpm
	Discharge Velocity	2.80		fps		3.20		fps		#DIV/0!			fps
	Pipe Friction to Gauge	0.60		ft		0.78		ft		#DIV/0!			ft
	Pump Head	**68.1**		**ft**		**68.6**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**110**		**gpm**		**125**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

-Select input using dropdown list.

-Input used in calculations.

!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size

SCS-001 Drawdown Test
TDH (ft)
90
80
70
60
50
40
30
20
10
0
0
100
200
300
400
500
600
700
800
900
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2

WARNING
MARION COUNTY UTILITIES
Lift Station- SCS-001
For Emergency Call
307-6000

Marion County

Lift Station Drawdown Testing

Lift Station Name:	LOH-002 (Loch Harbor 2)		
Date:	4/30/2020	**Time Tested:**	2:45
Tested By:	Mylene, Mike, Erik, Addison, TJ		

26 vert 90 hor

Station Info	**Wetwell Φ (equivalent diameter)**	6.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	18.5	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-26	in	-2.16666667	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	211.51	gal/ft				

		Pump 1				Pump 2				Pump 3			
Pump Info	**Manufacturer**	FLYGT				FLYGT							
	Model	NP 3153				NP 3153							
	Impeller			in	code 465			in	code 465				in
	Horsepower	15				15							
Pump Test	**Static Pressure**	30		psi	69.3	30		psi	69.3				psi
	Running Pressure	34		psi	78.54	34		psi	78.54				psi
	Drawdown Initial Depth**	ft	103.5	in	8.63	ft	106.5	in	8.88	ft			in
	Drawdown Final Depth**	ft	106.5	in	8.88	ft	110	in	9.17	ft			in
	Drawdown Time	min	60	sec	1	min	60	sec	1	min			sec
	Inflow Initial Depth**	ft	0	in	0.00	ft	0	in	0.00	ft			in
	Inflow Final Depth**	ft	0	in	0.00	ft	0	in	0.00	ft			in
	Fill Time	min	60	sec	1.00		60	sec	1.00	min			sec
	Measure from wet well top down to ground level			in									
	Drawdown Flow	53		gpm		62		gpm		#DIV/0!			gpm
	Inflow	0		gpm		0		gpm		#DIV/0!			gpm
	Discharge Velocity	1.35		fps		1.58		fps		#DIV/0!			fps
	Pipe Friction to Gauge	0.14		ft		0.19		ft		#DIV/0!			ft
	Pump Head	**85.3**		**ft**		**85.6**		**ft**		**#DIV/0!**			**ft**
	Pump Flow	**53**		**gpm**		**62**		**gpm**		**#DIV/0!**			**gpm**

Calibrated Model Results

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

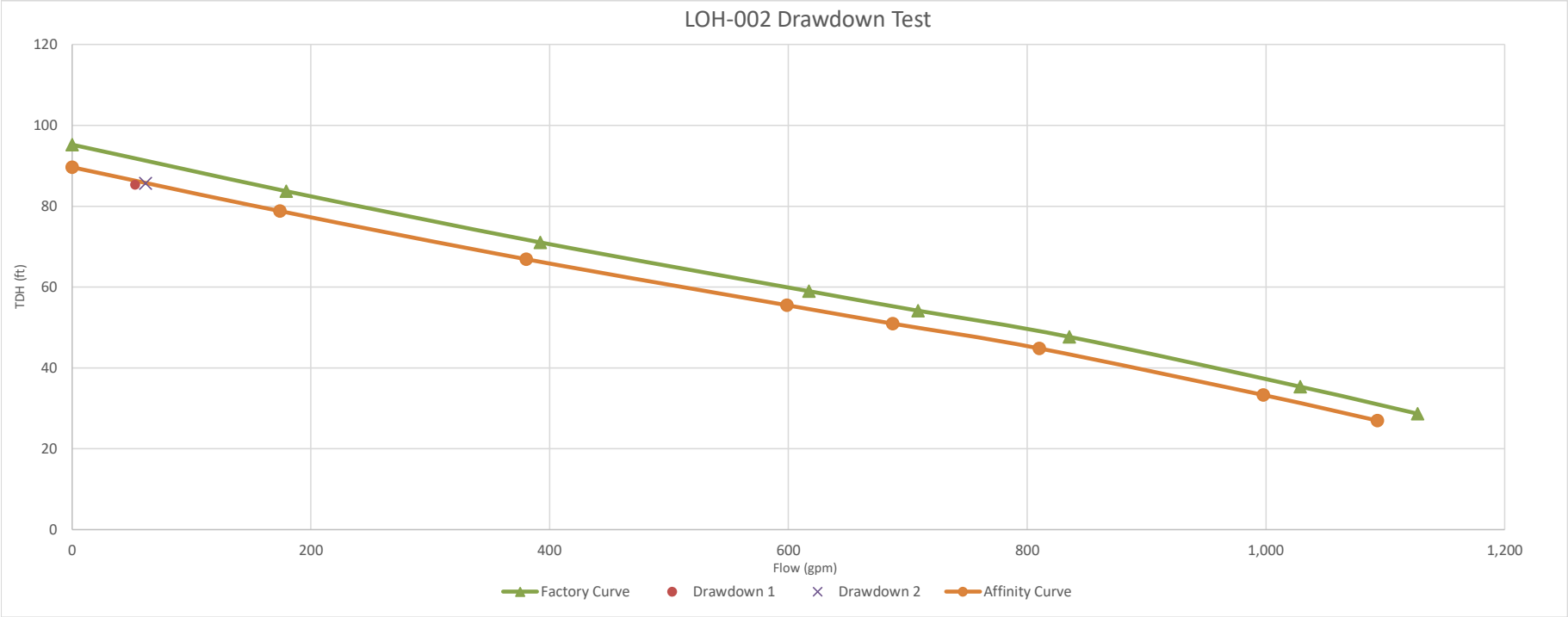
-Select input using dropdown list.

-Input used in calculations.

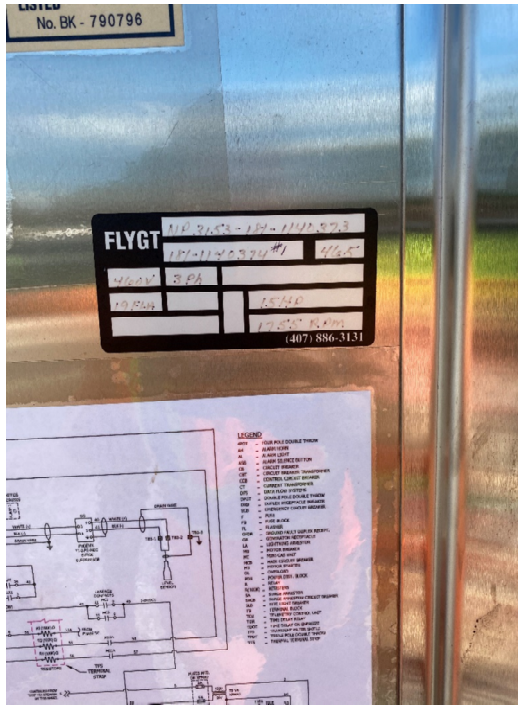
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


LOH-002 Drawdown Test
TDH (ft)
120
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
Flow (gpm)
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

MARION COUNTY UTILITIES
Lift Station-LOH-002
For Emergency Call
671-8510


No. BK - 790796
FLYGT
(407) 886-3131

Marion County

Lift Station Drawdown Testing

Lift Station Name:	SCS-003		
Date:	4/30/2020	**Time Tested:**	12:30
Tested By:	Mylene, Mike, Erik, Addison, TJ		

84 hor 22 vert

Station Info	**Wetwell Φ (equivalent diameter)**	8.0	ft		**Discharge FM Φ**	4	in
	FM Length From Pump to Pressure Gauge	21.2	ft		**Friction "C" Factor**	120	
	Height to Pressure Gauge*	-22	in	-1.83333333	**∑[Resistance Coeff. (K)]**	3.25	
	Wetwell Volume/ft	376.01	gal/ft				

		Pump 1			Pump 2			Pump 3		
Pump Info	**Manufacturer**	FLYGT			FLYGT					
	Model	NP 3153			NP 3153					
	Impeller		in	code 464		in	code 464		in	
	Horsepower	15			15					
Pump Test	**Static Pressure**	10	psi	23.1	10	psi	23.1		psi	
	Running Pressure	22	psi	50.82	24	psi	55.44		psi	
	Drawdown Initial Depth**	ft 175	in	14.58	ft 177	in	14.75	ft	in	
	Drawdown Final Depth**	ft 177	in	14.75	ft 179	in	14.92	ft	in	
	Drawdown Time	min 60	sec	1	min 60	sec	1	min	sec	
	Inflow Initial Depth**	ft 185	in	15.42	ft 185	in	15.42	ft	in	
	Inflow Final Depth**	ft 181	in	15.08	ft 181	in	15.08	ft	in	
	Fill Time	min 60	sec	1.00	60	sec	1.00	min	sec	
	Measure from wet well top down to ground level		in							
	Drawdown Flow	63	gpm		63	gpm		#DIV/0!	gpm	
	Inflow	125	gpm		125	gpm		#DIV/0!	gpm	
	Discharge Velocity	4.80	fps		4.80	fps		#DIV/0!	fps	
	Pipe Friction to Gauge	1.76	ft		1.76	ft		#DIV/0!	ft	Calibrated Model Results
	Pump Head	**65.8**	**ft**		**70.6**	**ft**		**#DIV/0!**	**ft**	
	Pump Flow	**188**	**gpm**		**188**	**gpm**		**#DIV/0!**	**gpm**	

156 @100'

*Measured from top of wetwell. Use negative numbers for measurements below top of wetwell.

**Measured from top of wetwell.

-Information only. Numerical values are not used in calculations.

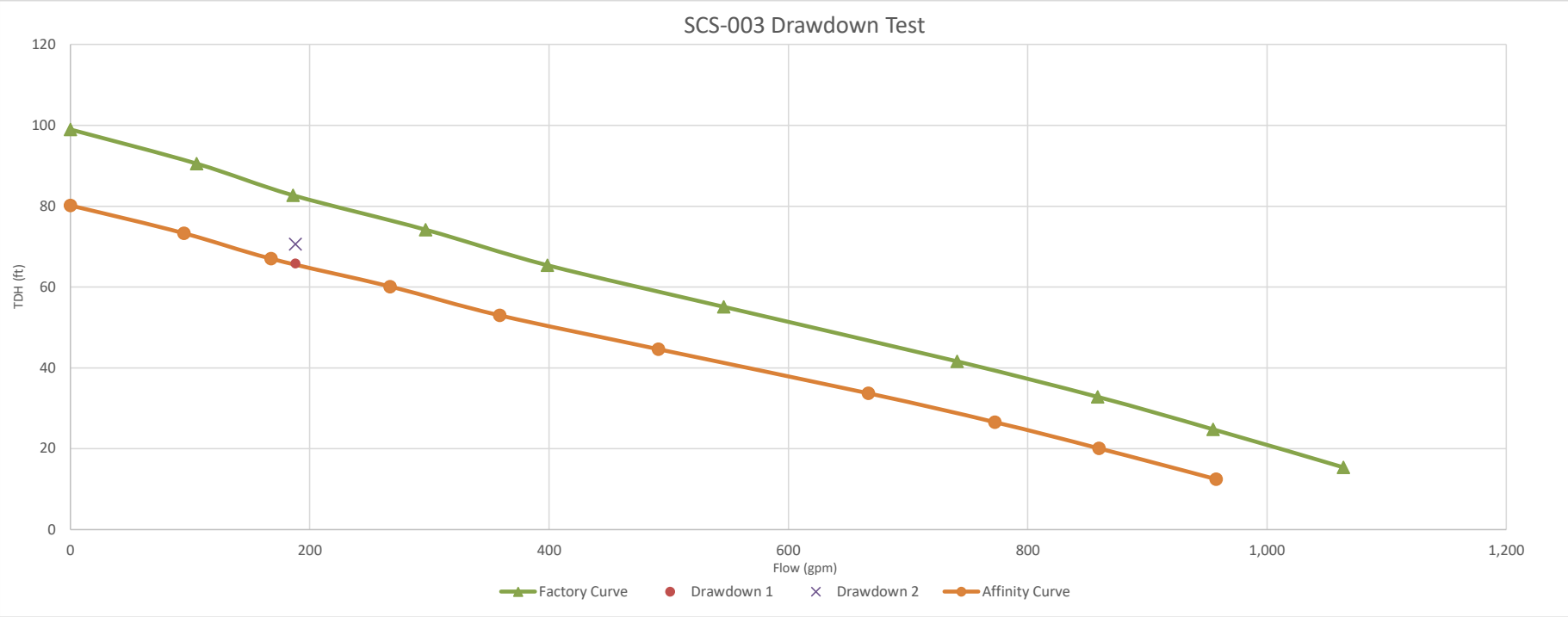
-Select input using dropdown list.

-Input used in calculations.

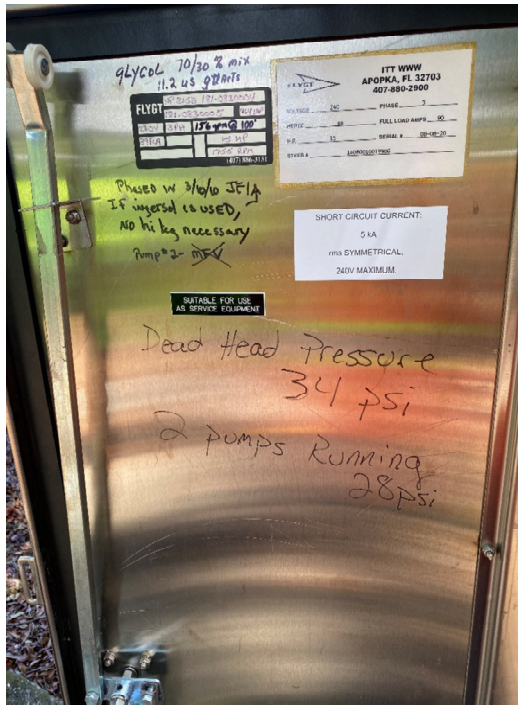
!!!!!!! **At NO TIME can the Influent Pipe (invert) be at or under the Sewage level. Take pictures of pump cabinet for LS# and wet well with influent pipe flowing and manifold with press. gauge showing.**

ADDITIONAL NOTES

4" volute size


SCS-003 Drawdown Test
TDH (ft)
Flow (gpm)
0
20
40
60
80
100
120
0
200
400
600
800
1,000
1,200
Factory Curve
Drawdown 1
Drawdown 2
Affinity Curve

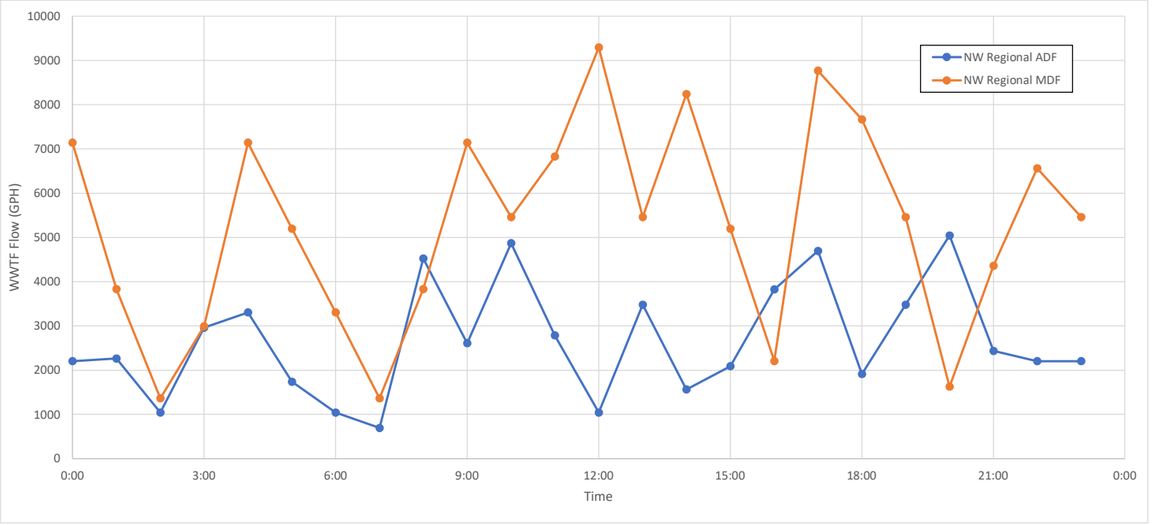
MARION COUNTY UTILITIES
Lift Station- SCS-003
For Emergency Call
307-6000

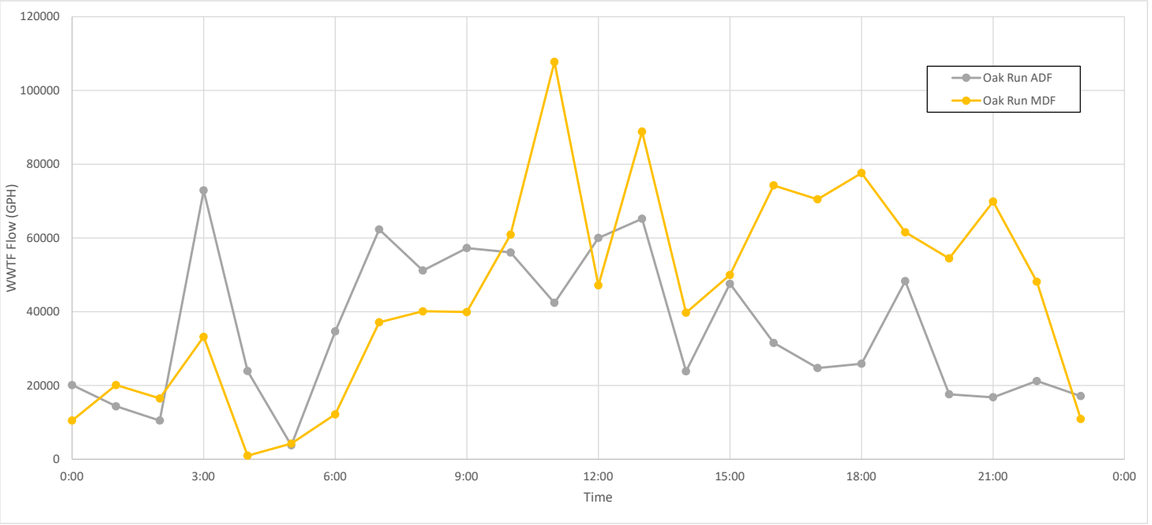

ITT WWW
APOPKA, FL 32703
407-880-2900
SHORT CIRCUIT CURRENT:
5 kA
rms SYMMETRICAL,
240V MAXIMUM
SUITABLE FOR USE AS SERVICE EQUIPMENT
Dead Head Pressure
34 psi
2 Pumps Running
28psi

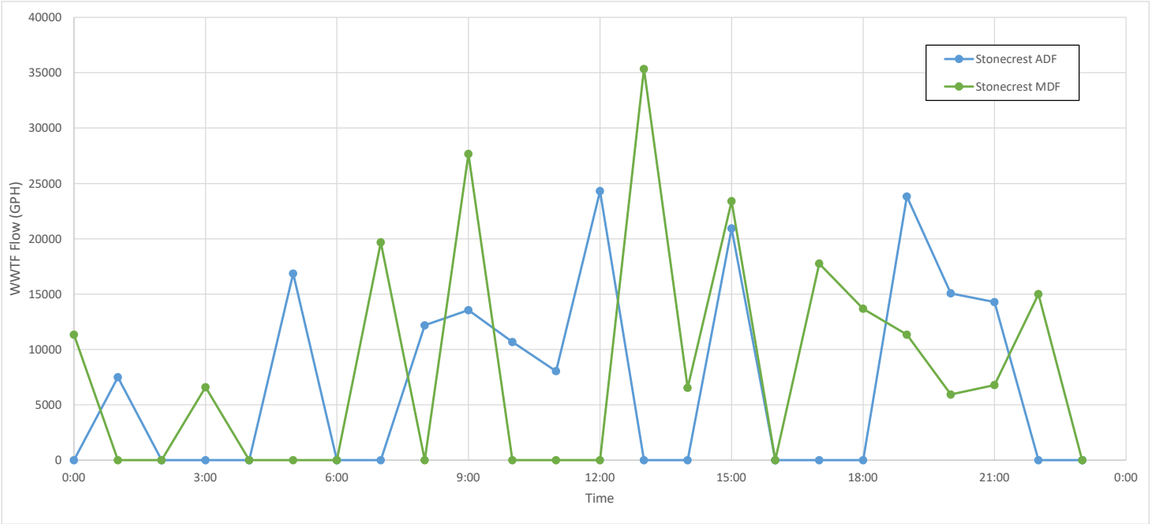
Appendix G

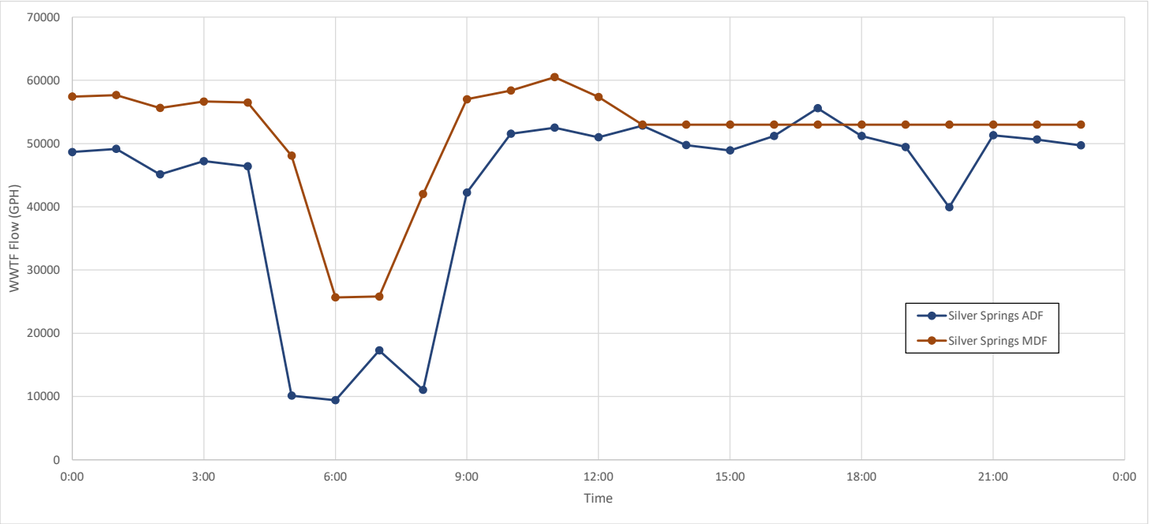
Diurnal Curves

WWTF Hourly Influent Data

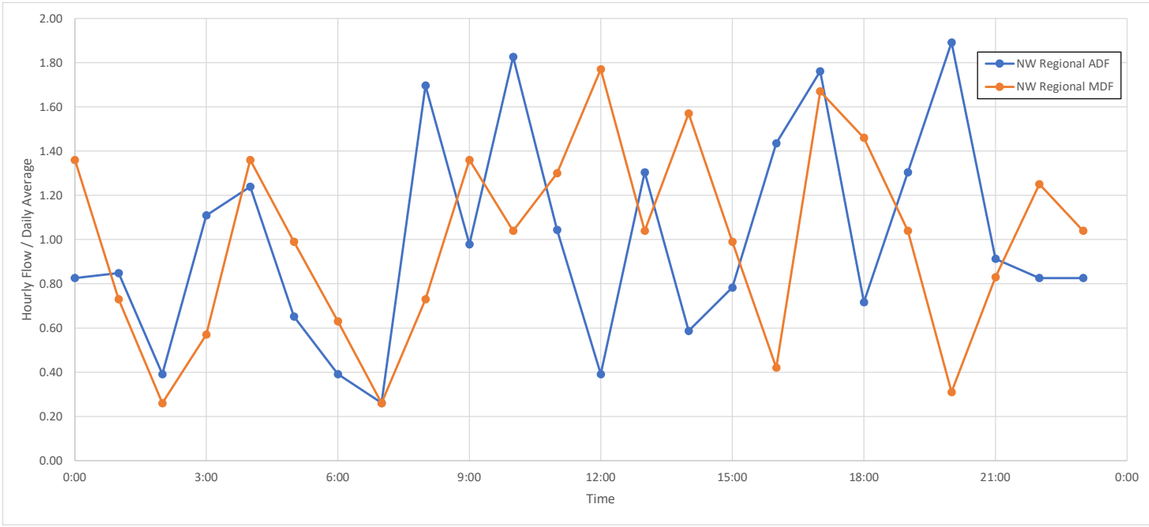


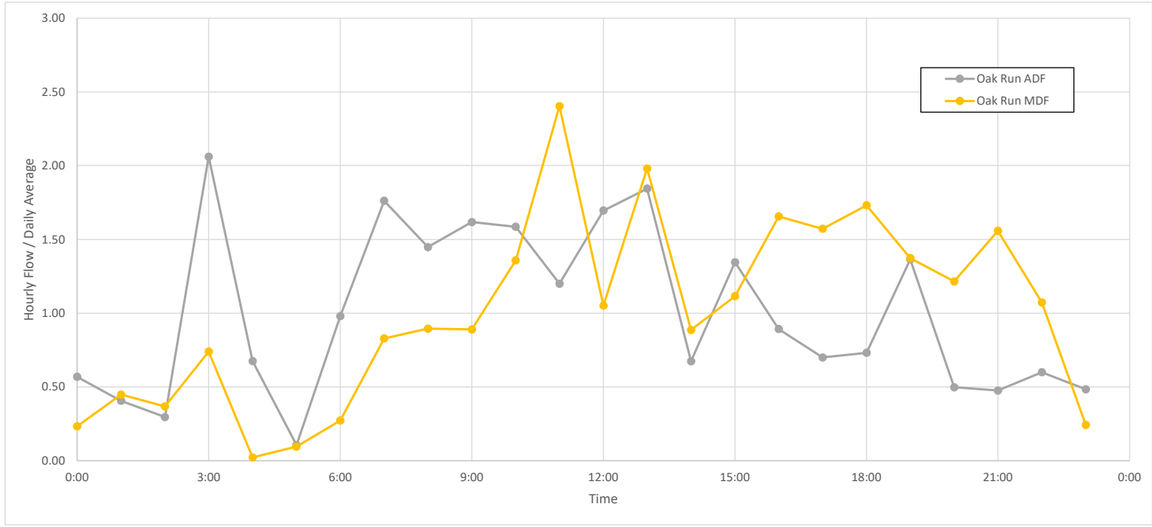


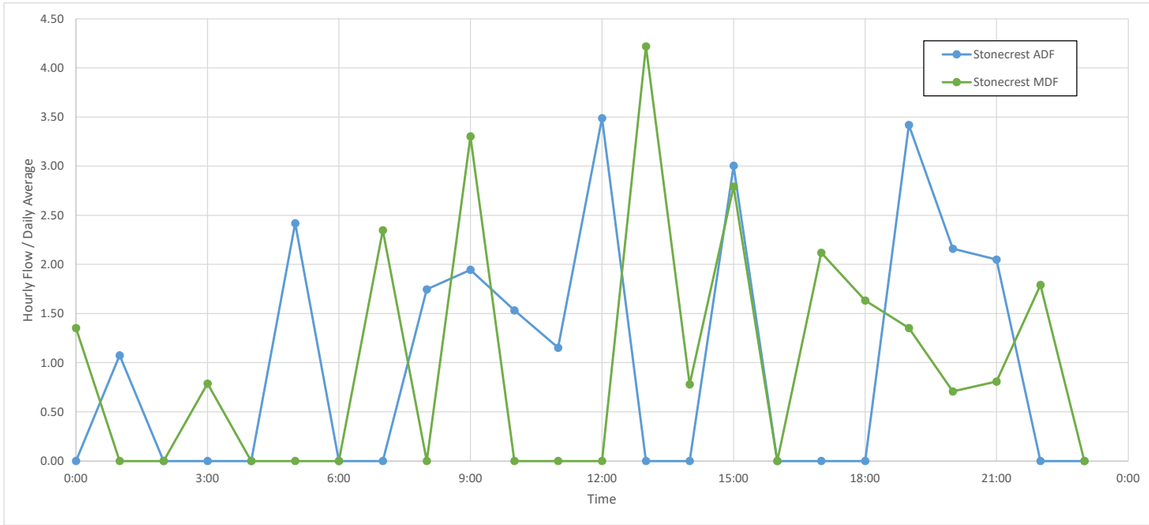


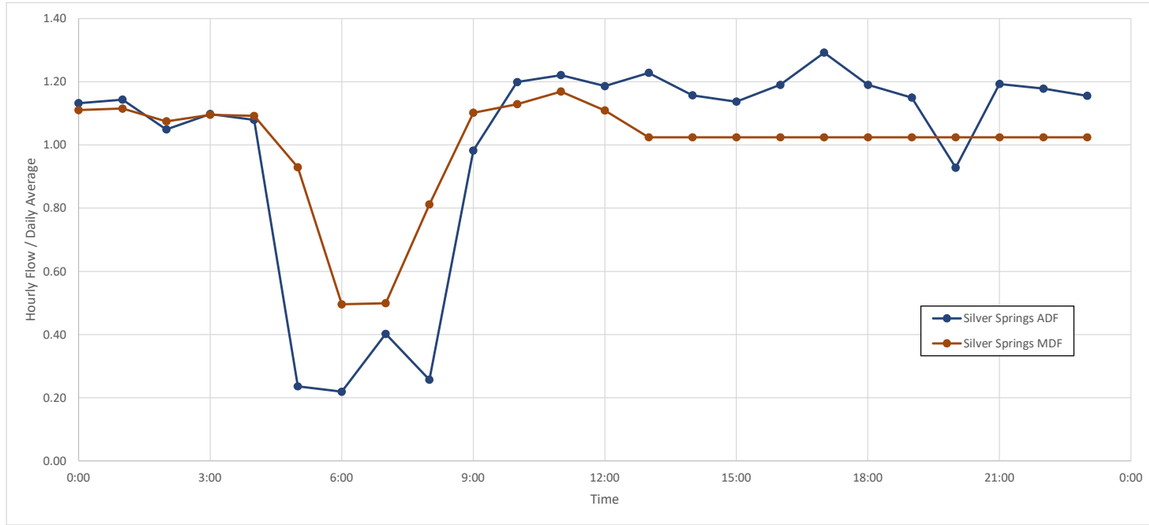


Normailized WWTF Hourly Influent Data









Appendix H

Stakeholder Engagement and Public Involvement

Redacted Sign-In Sheets

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 13, 2020**

LOCATION OF MEETING: American Legion Post 58, 10730 US Hwy 41, Dunnellon, FL 34432 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Troy Slattery	[redacted]	
Dewey Dall Huff		
Frank Gargano		
Tom Worrell		
Anita Williams		
		PHONE: EMAIL:
		PHONE: EMAIL:
		PHONE: EMAIL:
		PHONE: EMAIL:

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 13, 2020**

LOCATION OF MEETING: American Legion Post 58, 10730 US Hwy 41, Dunnellon, FL 34432 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Savannah Kirwan	[redacted]	
Cathy Redd	[redacted]	
Brent White	[redacted]	
Rondeau Denise & Richard	[redacted]	
Dane Myers	[redacted]	
Dale Burns	[redacted]	
	[redacted]	
		PHONE: EMAIL:
		Phone: EMAIL:
		Phone: EMAIL:

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 13, 2020**

LOCATION OF MEETING: American Legion Post 58, 10730 US Hwy 41, Dunnellon, FL 34432 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
City of Dunnellon - Dawn Jeff Bown	[redacted]	
Nigel Borzet.		
		EMAIL:
		PHONE:
		EMAIL:
		PHONE:
		EMAIL:
		PHONE:
		EMAIL:
		PHONE:
		EMAIL:
		PHONE:
		EMAIL:
		Phone:
		EMAIL:
		Phone:
		EMAIL:

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 15, 2020**

LOCATION OF MEETING: Kiwanis Beach at Albright Park, 15380 SE 140th Ave Rd, Lake Weir, FL 32195 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Jane Sands	[redacted]	
Robert H. Geast		
Betty Strate		
GREG WILEY		
Susan Moseley		
ANNE BETTS		
Lonnie Rawls		
Pat Rawls		
Jim & Bonnie Meyer		
WAYNE BIRKENMEYER		

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 15, 2020**

LOCATION OF MEETING: Kiwanis Beach at Albright Park, 15380 SE 140th Ave Rd, Lake Weir, FL 32195 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Clifford Forrester	[redacted]	
Rich Brown	[redacted]	
Trish Brown	[redacted]	
Liz Schnebel	[redacted]	
Chris Shute	[redacted]	
Kim Preston	[redacted]	
Pam McCarter	[redacted]	
Carl Johns	[redacted]	
Leon Norrey	[redacted]	
Jeff Sabra	[redacted]	

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 15, 2020**

LOCATION OF MEETING: Kiwanis Beach at Albright Park, 15380 SE 140th Ave Rd, Lake Weir, FL 32195 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Reese Bourgeois	[redacted]	[redacted]
Charles deMenezes	[redacted]	[redacted]
Terry Turner	[redacted]	[redacted]
Carol Caruso	[redacted]	[redacted]
Jim Stueda Jr	[redacted]	[redacted]
		EMAIL:
		PHONE: EMAIL:
		PHONE: EMAIL:
		PHONE: EMAIL:
		PHONE: EMAIL:

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 6, 2020**

LOCATION OF MEETING: Marion Oaks Community Center, 294 Marion Oaks Ln, Ocala, FL 34473 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Rhonda Stanton Crooks	[redacted]	
MARGARET SHANLEY	[redacted]	
Maria Ruiz	[redacted]	
Donna Cole	[redacted]	
John Burt Webb	[redacted]	
J. Julie	[redacted]	
Roberta Serra	[redacted]	
Julie Sybblis	[redacted]	
ALFRED & THEODORA	[redacted]	
CHRISTOPHER	[redacted]	
AITAGRACIA FIRET	[redacted]	

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 6, 2020**

LOCATION OF MEETING: Marion Oaks Community Center, 294 Marion Oaks Ln, Ocala, FL 34473 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Bill Forsters	[redacted]	
Harry + Janis Brennan		
Lynn Greene		
Rebecca Lewis		
Ellen Chestnut		
Florence Chaubonneau		
Raymond Chaubonn		
Geneva Hall		
Anne Canadote		
Juliette Smith		

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 6, 2020**

LOCATION OF MEETING: Marion Oaks Community Center, 294 Marion Oaks Ln, Ocala, FL 34473 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Todd Hollander	[redacted]	
Alice Mitchell		
Fazia A wells		
Lenny Costi		
Gleth Goitfra		
Enid Francis		
LIMOUS & SEBRINA MACK		
Bobby Whipple		
Sandra Strother		
JUAN PEREZ MARIA PEREZ		

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 6, 2020**

LOCATION OF MEETING: Marion Oaks Community Center, 294 Marion Oaks Ln, Ocala, FL 34473 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Helen Harper	[redacted]	[redacted]
Audrey Timol	[redacted]	[redacted]
Marie Cochran	[redacted]	[redacted]
Marietta Sweeney	[redacted]	[redacted]
Wanda Wright	[redacted]	[redacted]
WALTER SARGEANT	[redacted]	[redacted]
		EMAIL:
		PHONE:
		EMAIL:
		PHONE:
		EMAIL:
		PHONE:
		EMAIL:

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 8, 2020**

LOCATION OF MEETING: Silver Springs Shores, Community & Youth Center, 590 Silver Rd, Ocala, FL 34472 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Sheryl + Richard Bragg	[redacted]	[redacted]
Lezli Duff	[redacted]	[redacted]
Mary Davis	[redacted]	[redacted]
Patrick Miller	[redacted]	[redacted]
Cynthia DeLaRosa	[redacted]	[redacted]
		EMAIL:
		PHONE: EMAIL:
		PHONE: EMAIL:
		Phone: EMAIL:
		Phone: EMAIL:

JonesEdmunds

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Public Information and Outreach Meeting DATE: **October 20, 2020**

LOCATION OF MEETING: Silver Springs State Park, 5656 E Silver Springs Blvd, Silver Springs, FL 34488 TIME: 6:00 – 8:00 PM

(PLEASE PRINT)

NAME	ADDRESS	PHONE AND EMAIL
Trudy Carroll	[redacted]	[redacted]
Shawn & Cind Riley	[redacted]	[redacted]
Shawn & Jon Bianca	[redacted]	[redacted]
CRAIG CURRY	[redacted]	[redacted]
MARY SAVAGE	[redacted]	[redacted]
	[redacted]	[redacted]
		PHONE: EMAIL:
		PHONE: EMAIL:
		Phone: EMAIL:
		Phone: EMAIL:

Public Outreach Response – Surveys

Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify) State + National

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500 LoL
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [x] I have all the information I need

8. All costs being equal, what would you prefer?
   - either way
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE

MARION COUNTY, FLORIDA · IN GOD WE TRUST

JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA
IN GOD WE TRUST

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Rainbow Springs Nutrient Reduction Citizen Survey

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   - [ ] Not Strongly at All
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   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [x] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

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   - [x] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify) _____

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   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

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OVER FOR MORE →

MARION COUNTY, FLORIDA · IN GOD WE TRUST

JonesEdmunds

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Name (optional) _____

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or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

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   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [x] Wastewater Treatment Plants
   - [ ] Other _____

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   - [ ] Somewhat
   - [x] No

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OVER FOR MORE ➡

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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wwstudy@marioncountyfl.org

or through the website at
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JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

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   - [ ] Wastewater Treatment Plants
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OVER FOR MORE →

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JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Richard Rondeau

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

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   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
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   - [ ] Allow residents to pay assessments over time
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   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Denise Terrell-Randean

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify) _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Curtis Dale Burns

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

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   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
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   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify) Grants

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

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OVER FOR MORE →

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   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify) all 3 to extent possible + state funds

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
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   - [x] $5,000 - $7,500
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OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

RRC is a strong advocate of this Conversion project and we would like to see it succeed. We may be interested in further participation.

Name (optional) Burt Eno - RRC President

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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Silver Springs Nutrient Reduction Citizen Survey

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   - [x] Very Strongly
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   - [ ] Not Strongly at All
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2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
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   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

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OVER FOR MORE →

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MARION COUNTY, FLORIDA · IN GOD WE TRUST

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OVER FOR MORE →

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OVER FOR MORE →

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MARION COUNTY, FLORIDA
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   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
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   - [ ] All Marion County residents
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   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
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OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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MARION COUNTY, FLORIDA
IN GOD WE TRUST

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

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   - ✓ Very Strongly
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   - Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

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   - Yes
   - ✓ Somewhat
   - No

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   - All Marion County residents
   - Home and business owners with septic systems
   - Project area-specific residents
   - ✓ Combination (please specify) 50% HOMEOWNERS + GRANTS

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - $2,500 - $5,000
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10. **Is there any additional information you would like to provide or questions you would like to ask?**

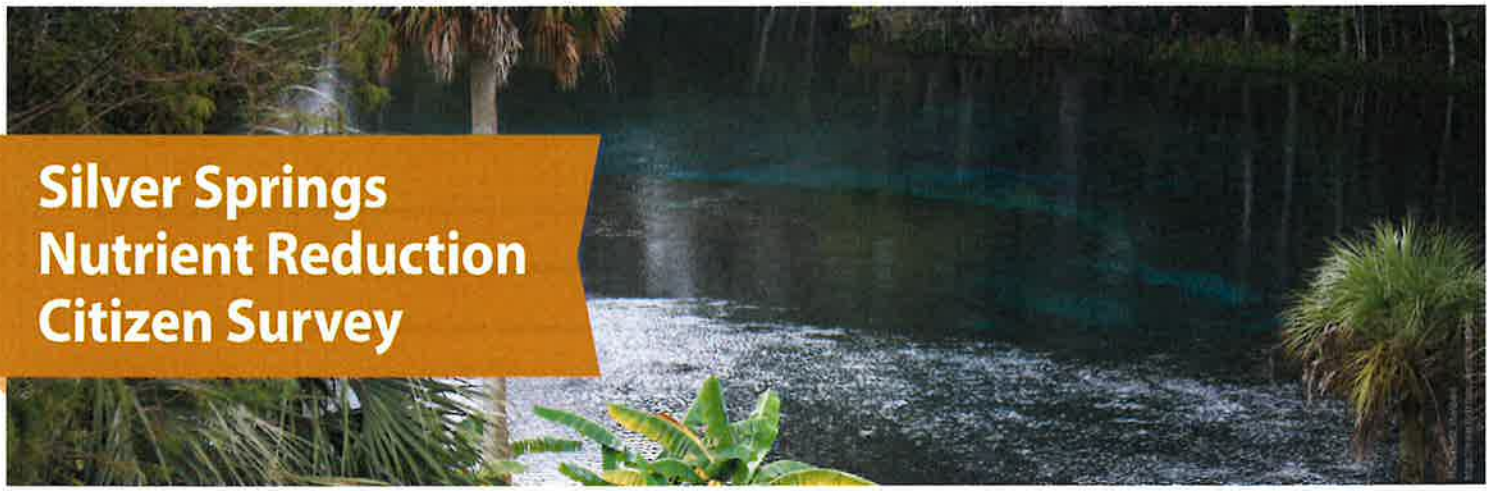
TIMING FOR WITHIN LAKE WEIR MIGHT RECEIVE SOME SEWER SYSTEM

Name (optional) Reese Bourgeois

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds



Silver Springs Nutrient Reduction Citizen Survey

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Name (optional) _____

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MARION COUNTY, FLORIDA
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   - [x] Pursue grants
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OVER FOR MORE ➡

MARION COUNTY, FLORIDA · IN GOD WE TRUST

JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
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   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
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OVER FOR MORE →

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10. Is there any additional information you would like to provide or questions you would like to ask?

Saving Lake Weir Water quality is a personal objective.

Cost effective means to move from Septic to Sewer would move the ball in the right direction

Thank You

Name (optional) Bonnie Meyer

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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OVER FOR MORE ➡

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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Name (optional) _____

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MARION COUNTY, FLORIDA
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OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Susan Moseley

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

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OVER FOR MORE →

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

HOW SOON CAN WE GET THIS IN GEAR FOR LAKE WEIR?

Name (optional) CHRIS SHUTE

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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Silver Springs Nutrient Reduction Citizen Survey

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   - ✓ Very Strongly
   - Somewhat Strongly
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2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - ✓ Septic Tanks
   - Farm Fertilizer
   - ✓ Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - Yes
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OVER FOR MORE →

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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Name (optional) _____

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wwstudy@marioncountyfl.org

or through the website at
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MARION COUNTY, FLORIDA
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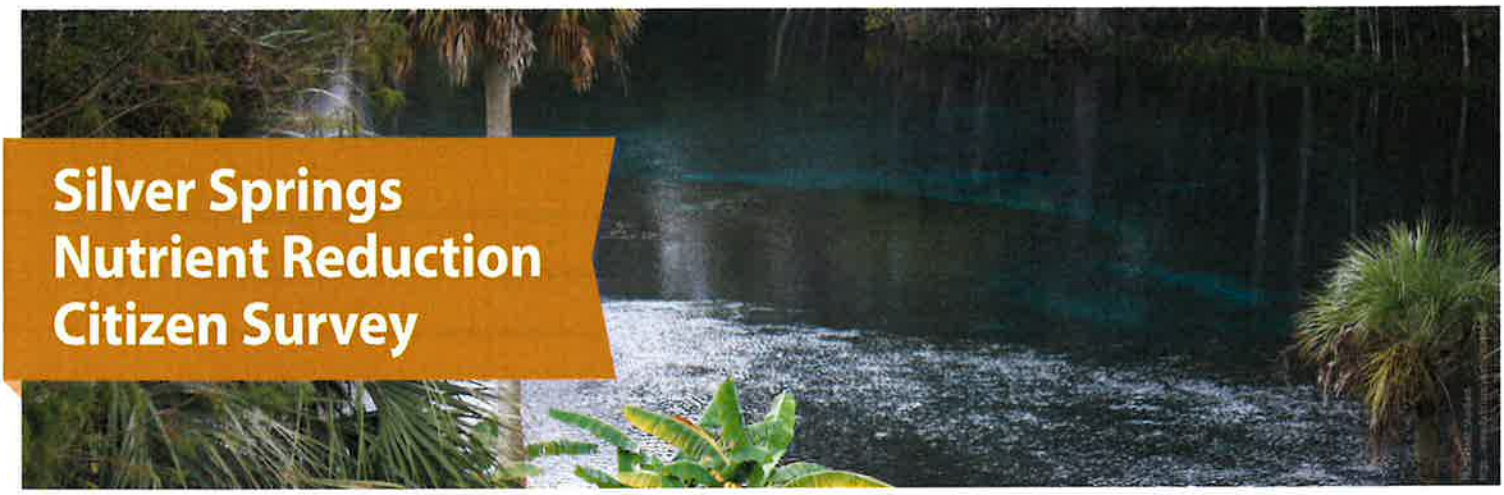

Silver Springs Nutrient Reduction Citizen Survey

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OVER FOR MORE →

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

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MARION COUNTY, FLORIDA
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10. **Is there any additional information you would like to provide or questions you would like to ask?**

We ~~I~~ live on Lake Weir. We are willing to pay part or all of the costs to convert from Septic to Centralized sewer. We are willing to pay as add'l line item on Real Estate tax bill or write a check.

We Want clean water in Lake Weir.

Name (optional) Carl E Johns Jr. Cell (321) 403-1320

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

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OVER FOR MORE →

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MARION COUNTY, FLORIDA
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JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

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OVER FOR MORE

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Just a comment
property value around Lake Weir go down
by Large amounts if we don't

MAKE Lake Weir Great Again!

Name (optional) Terry Turner

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA · IN GOD WE TRUST

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

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   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Robert Graff

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [x] Home and business owners with septic systems
   - [x] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [x] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Todd SAB

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wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [x] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

   ?

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - ✓ Very Strongly
   - Somewhat Strongly
   - Not Very Strongly
   - Not Strongly at All
   - Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - ✓ Septic Tanks
   - Farm Fertilizer
   - ✓ Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - Yes
   - Somewhat
   - ✓ No

4. Are you familiar with how septic systems operate?
   - ✓ Yes
   - Somewhat
   - No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - All Marion County residents
   - Home and business owners with septic systems
   - Project area-specific residents
   - Combination (please specify) all of the above

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - $2,500 - $5,000
   - $5,000 - $7,500
   - $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - More information on what must be done in what areas of the county
   - More information on what homes/septic systems are impacted
   - ✓ More information on the cost of different alternatives
   - I have all the information I need

8. All costs being equal, what would you prefer?
   - ✓ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ✓ Pursue grants
   - ✓ Allow residents to pay assessments over time
   - ✓ Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - ✓ Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Keep the Citizens updated as to what decisions are been made. and how things are going in the neighborhood.

Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

     All of the above

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - ✓ Very Strongly
   - Somewhat Strongly
   - Not Very Strongly
   - Not Strongly at All
   - Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - Septic Tanks
   - Farm Fertilizer
   - Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - Yes
   - Somewhat
   - ✓ No

4. Are you familiar with how septic systems operate?
   - Yes
   - Somewhat
   - ✓ No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - All Marion County residents
   - Home and business owners with septic systems
   - Project area-specific residents
   - Combination (please specify) not sure

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - $2,500 - $5,000
   - $5,000 - $7,500
   - $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - More information on what must be done in what areas of the county
   - More information on what homes/septic systems are impacted
   - More information on the cost of different alternatives
   - I have all the information I need

8. All costs being equal, what would you prefer?
   - ✓ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - Pursue grants
   - Allow residents to pay assessments over time
   - Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - ✓ Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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MARION COUNTY, FLORIDA
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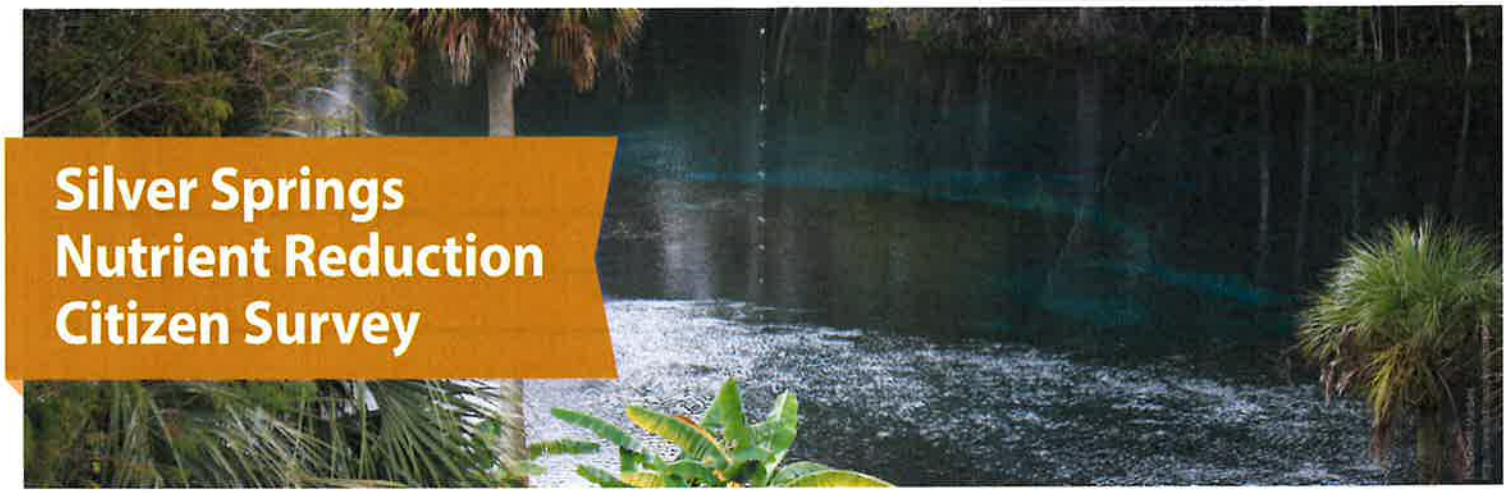
JonesEdmunds



Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify) _____

   the
   How will this impact Elderly?

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

   anything else will add to homelessness

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [x] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
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   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
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MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

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   - [ ] Septic Tanks
   - [ ] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

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   - [ ] More information on what must be done in what areas of the county
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   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Some Items listed would have had
a better Idea if we had a meeting

Name (optional) _____

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wwstudy@marioncountyfl.org

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MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [x] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [ ] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [x] Other Not Sure

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify) County + Residents, Business

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
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   - [ ] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE

JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

I don't feel that I ~~need~~ was needed to come If MARION OAKS is not been concidered at this time. Waste of time.

Name (optional) [illegible]

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [x] Home and business owners with septic systems
   - [x] Project area-specific residents
   - [x] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
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   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
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   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

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10. Is there any additional information you would like to provide or questions you would like to ask?

I would like to see scientific information regarding breaking down nitrogen in home septic systems.
I seems if we can send rockets to the moon and planets and recover them without problems we should be able to develop a chemical or non abrasive substance that could be used to filtrate a home septic system.

Name (optional) _____

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JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [x] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify) HO Need Assistance

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE

MARION COUNTY, FLORIDA — IN GOD WE TRUST

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify) _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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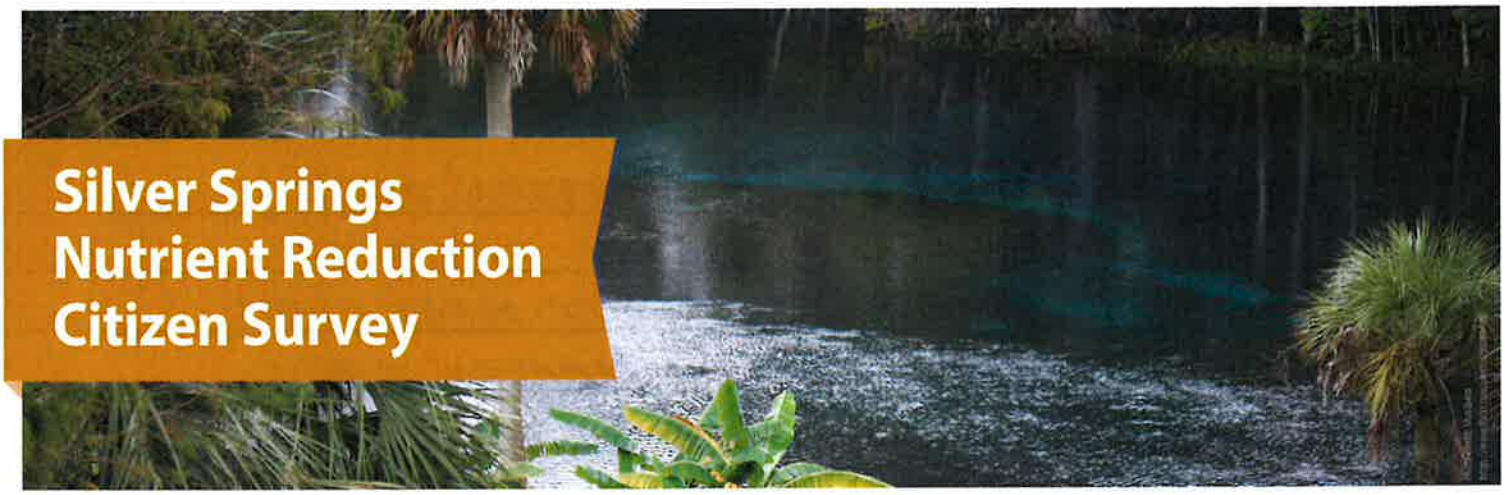

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [ ] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [x] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

HOUSES ARE GOING UP FAST IN MARION OAKS
FARMS ON SHADY ROAD ARE UP FOR SALE
AS A HOMEOWNER IT IS HARD TO MEET ENDS
NOW. HOMEOWNERS NOW IN MARION OAKS
ARE PAYING HIGH FOR SEWERS RIGHT NOW
SILVER SPRINGS WAS A FUN PLACE TO GO
WITH THE FAMILY NOW RIDES ARE STILL
UP RUSTING

Name (optional) _____

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wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA
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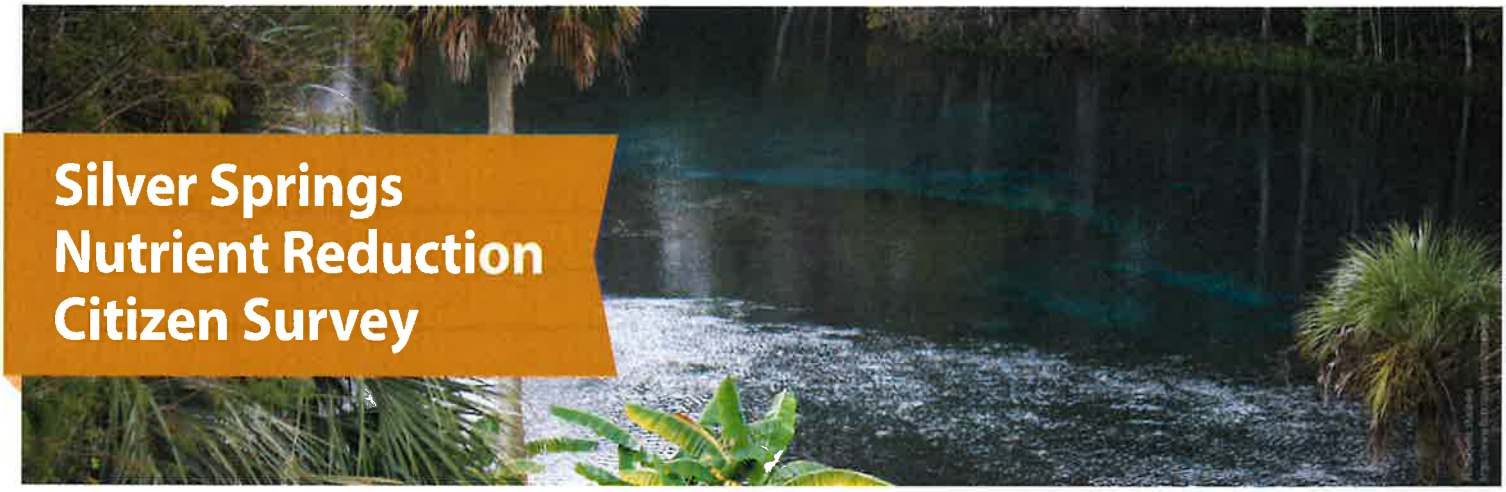

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [x] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

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6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

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7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [x] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
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   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [x] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [x] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
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   - [x] More information on the cost of different alternatives
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8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - ✓ Very Strongly
   - Somewhat Strongly
   - Not Very Strongly
   - Not Strongly at All
   - Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - ✓ Septic Tanks
   - ✓ Farm Fertilizer
   - Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - Yes
   - Somewhat
   - ✓ No

4. Are you familiar with how septic systems operate?
   - Yes
   - ✓ Somewhat
   - No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - All Marion County residents
   - ✓ Home and business owners with septic systems
   - Project area-specific residents
   - Combination (please specify) _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - $2,500 - $5,000
   - ✓ $5,000 - $7,500
   - $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - More information on what must be done in what areas of the county
   - More information on what homes/septic systems are impacted
   - ✓ More information on the cost of different alternatives
   - I have all the information I need

8. All costs being equal, what would you prefer?
   - ✓ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - Pursue grants
   - Allow residents to pay assessments over time
   - Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - ✓ Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify) _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
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8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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or through the website at
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MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [x] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [x] Other Ocala

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify) The State.

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] ~~$2,500 - $5,000~~
   - [ ] ~~$5,000 - $7,500~~
   - [ ] ~~$7,500 - $10,000~~

   None

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
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8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
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9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
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   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

No one has told about this.
No Mail outs nothing.

Name (optional) Lenny Costa

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wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA
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Rainbow Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Rainbow Springs?
   - ✓ Very Strongly
   - Somewhat Strongly
   - Not Very Strongly
   - Not Strongly at All
   - Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Rainbow Springs?
   - ✓ Septic Tanks
   - ✓ Farm Fertilizer
   - Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - ✓ Yes
   - Somewhat
   - No

4. Are you familiar with how septic systems operate?
   - ✓ Yes
   - Somewhat
   - No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - ✓ All Marion County residents
   - Home and business owners with septic systems
   - Project area-specific residents
   - Combination (please specify) _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - $2,500 - $5,000
   - $5,000 - $7,500
   - $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - More information on what must be done in what areas of the county
   - More information on what homes/septic systems are impacted
   - ✓ More information on the cost of different alternatives
   - I have all the information I need

8. All costs being equal, what would you prefer?
   - ✓ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ✓ Pursue grants
   - Allow residents to pay assessments over time
   - Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - ✓ Develop a local funding source that provides an offset to costs

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) R Crooks

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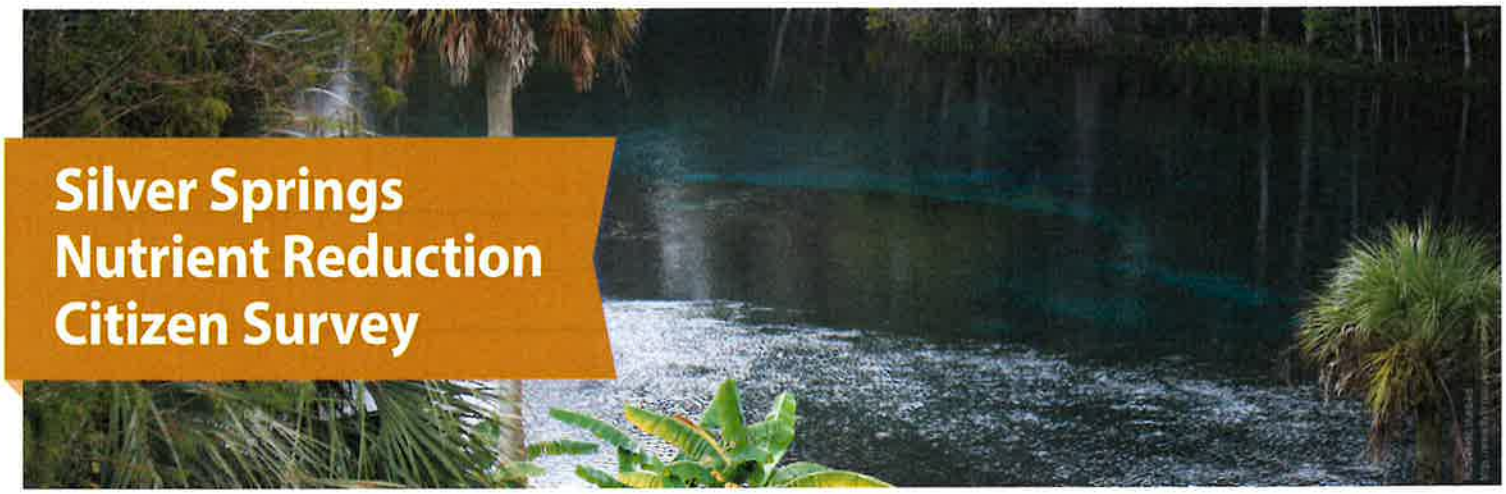
JonesEdmunds



Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Z Crooks

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA
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JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Patrick Miller

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Cynthia DelaRosa

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
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9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) Mary Davis

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

3

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [x] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

While OSTDSs do pose a large percentage of the nitrogen to the system, the county should be spending time addressing the other 71% of the nitrogen load on farms, turfs, & other uses. The vast majority comes from other sources & homeowners should not suffer for industrial users' lack of use in regards to best practices.

Name (optional) Lezli Duff

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other Golf Courses

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify) Government

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000 or Less
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

MARION COUNTY, FLORIDA · IN GOD WE TRUST

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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wwstudy@marioncountyfl.org

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MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [x] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [x] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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MARION COUNTY, FLORIDA · IN GOD WE TRUST

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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
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   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)
     Pls. help w/ grants

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

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   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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or through the website at
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MARION COUNTY, FLORIDA
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Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - ✓ Very Strongly
   - Somewhat Strongly
   - Not Very Strongly
   - Not Strongly at All
   - Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - ✓ Septic Tanks
   - ✓ Farm Fertilizer
   - Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - ✓ Yes
   - Somewhat
   - No

4. Are you familiar with how septic systems operate?
   - Yes
   - ✓ Somewhat
   - No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - ✓ All Marion County residents
   - Home and business owners with septic systems
   - Project area-specific residents
   - Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - ✓ $2,500 - $5,000
   - $5,000 - $7,500
   - $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ✓ More information on what must be done in what areas of the county
   - ✓ More information on what homes/septic systems are impacted
   - ✓ More information on the cost of different alternatives
   - ✓ I have all the information I need

8. All costs being equal, what would you prefer?
   - ✓ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ✓ Pursue grants
   - ✓ Allow residents to pay assessments over time
   - ✓ Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - ✓ Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

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wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - ✓ Very Strongly
   - Somewhat Strongly
   - Not Very Strongly
   - Not Strongly at All
   - Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - ✓ Septic Tanks
   - ✓ Farm Fertilizer
   - Lawn and Turf Fertilizer
   - ✓ Livestock Waste
   - Wastewater Treatment Plants
   - Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - Yes
   - ✓ Somewhat
   - No

4. Are you familiar with how septic systems operate?
   - ✓ Yes
   - Somewhat
   - No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - All Marion County residents
   - Home and business owners with septic systems
   - Project area-specific residents
   - Combination (please specify) NEW & REPLACE

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - ✓ $2,500 - $5,000
   - $5,000 - $7,500
   - $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ✓ More information on what must be done in what areas of the county
   - More information on what homes/septic systems are impacted
   - ✓ More information on the cost of different alternatives
   - I have all the information I need

8. All costs being equal, what would you prefer?
   - ✓ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ✓ Pursue grants
   - Allow residents to pay assessments over time
   - Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - Develop a local funding source that provides an offset to costs

OVER FOR MORE →

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JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
wwstudy@marioncountyfl.org

or through the website at
www.marioncountyfl.org/wwstudy

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JonesEdmunds

Silver Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Silver Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Silver Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Marion County residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [x] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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JonesEdmunds

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Name (optional) _____

You may submit via email at
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or through the website at
www.marioncountyfl.org/wwstudy

MARION COUNTY, FLORIDA · IN GOD WE TRUST

JonesEdmunds

Marion County Public Meetings Survey Questions - Responses

October 8-20, 2020

We received 55 surveys from the Open House attendees. Outlined below is a summary of the information.

1. How strongly do you feel about protecting the water quality of Silver/Rainbow Springs?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
Very Strongly	9	4	5	12	5
Somewhat Strongly	5	1	3	5	1
Not Very Strongly					
Not Strongly at All	1				
Neutral	2			1	

One did not answer.

2. What are the top 3 contributors to the water quality degradation in Silver/Rainbow Springs?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
Septic Tanks	8	5	7	16	6
Farm Fertilizer	11	4	5	11	6
Lawn/Turf Grass Fertilizer	7	3	3	13	3
Livestock Waste	12	3	6	12 1	3
WWTPs	2		2		
Other	2				1

Two did not answer.

3. Are you familiar with the Florida Springs and Aquifer Protection Act?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
Yes	3	1	2	3	1
Somewhat	4	3	2	12	4
No	10	1	4	3	1

One did not answer.

4. Are you familiar with how septic systems operate?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
Yes	10	4	4	15	4
Somewhat	6	1	3	3	1
No	2		1		1

5. Considering the cost of reducing nitrogen coming from a septic tank is between $15,000 and $25,000, who should participate in addressing this issue?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
All Marion Co. Residents	4	5	4	10	2
Home and Business Owners w/Septic Sys.	3		2	8	
Project Area-specific Residents	2			3	1
Combination (Please specify)	9		3	1	3

All above, Grants, State, County, Businesses & Residents

One did not answer.

6. What is a reasonable business or homeowner investment to comply with the Florida Springs and Aquifer Protection Act?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
$2,500-$5,000	9	4	7	9	6
$5,000-$7,500	2	1	1	3	
$7,500-10,000				5	

Comment: Anything else will add to homelessness

Four did not answer.

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
More information on what must be done in what areas of the county	6	3	3	6	6
More information on what homes/septic systems are impacted	6	3	2	9	5
More information on the cost of different alternatives	14	4	5	12	5
I have all the information I need			2	2	

One did not answer.

8. All costs being equal, what would you prefer?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
Centralized System	11	5	7	15	4
Decentralized System	3			2	2

Six did not answer

9. What should the county do to assist businesses or residents in meeting the requirements of the Florida Springs and Aquifer Protection Act?

	Marion Oaks	Silver Spgs Shores	Dunnellon	Lake Weir	Silver Spgs SP
Pursue grants	12	6	8	15	6
Allow residents to pay assessments over time	5	5	4	10	1
Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems	5	2	2	4	3
Develop a local funding source that provides an offset to costs	12	5	5	10	4

One did not answer.

10. Is there any additional information you would like to provide or questions you would like to ask?

-Add written comments from Q10 identifying and grouping by the location

Comments: Marion Oaks

1. Keep the citizens updated as to what decisions are being made, and how things are going in the neighborhood.
2. Some items listed would have had a better idea if we had a meeting
3. I don't feel that I was needed to come if Marion Oaks is not been considered at this time. Waste of time.
4. I would like to see scientific information regarding breaking down nitrogen in home septic systems. It seems if we can send rockets to the moon and planets and recover them without problems, we should be able to develop a chemical or non-abrasive substance that could be used to filtrate a home septic system.
5. Houses are going up fast in Marion Oaks farms on Shady Road are up for sale. As a homeowner it is hard to meet ends now. Homeowners now in Marion Oaks are paying high for sewers right now. Silver Springs was fun place to go with the family now rides are still up rusting.
6. No one was told about this. No Mail outs nothing.

Comments: Silver Springs Shore

1. While OSTDs to pose a large percentage of the nitrogen to the system, the County should be spending time addressing the other 71% of the nitrogen load on farms, turfs, other vices. The vast majority comes from other sources and homeowners should not suffer for industrial users lack of use in regards to best practices.

Comments: Dunnellon

1. RRC is a strong advocate of this conversion project and we would like to see it succeed. We may be interested in further participation.

Comments: Lake Weir

1. Timing for when Lake Weir Mike received some sewer system.
2. Saving Lake Weir water quality is a personal objective. Cost effective means to move from septic to sewer would move the ball in the right direction.
3. How soon can we get this in gear for Lake Weir?
4. We live on Lake Weir. We are willing to pay part or all of the cost to convert from septic to centralized sewer. We are willing to pay as additional line item or real estate tax bill or write a check. We want clean water in Lake Weir.
5. Just a comment, property value around Lake where go down by large amounts if we don’t. Make Lake Weir great again

Appendix I

Capital Improvement Plan

Project Sheets

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DL Pilot Project

Predecessor CIP: None

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. One (1) lift station will be constructed and discharge through a common force main to an existing force main on SE Maricamp Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
794 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 1
To: Year 5

PROJECT DETAILS

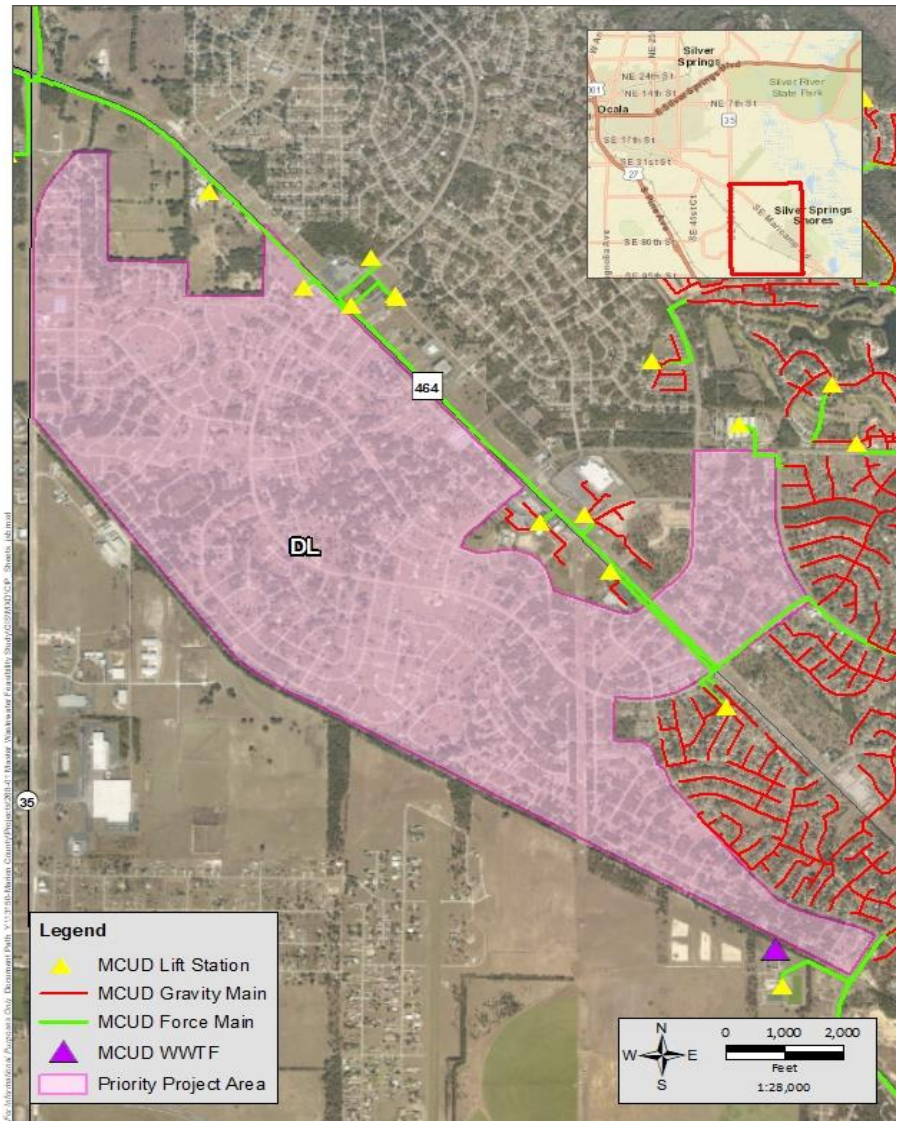
No. of OSTDS
100

No. of Total Lots
100

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**TBD**
Cost per Lot	**TBD**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DL Phase 1

Predecessor CIP: PPA DL Pilot Project

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (7) seven lift stations will be constructed and discharge through a common force main to an existing force main on SE Maricamp Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
12,572 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 1
To: Year 5

PROJECT DETAILS

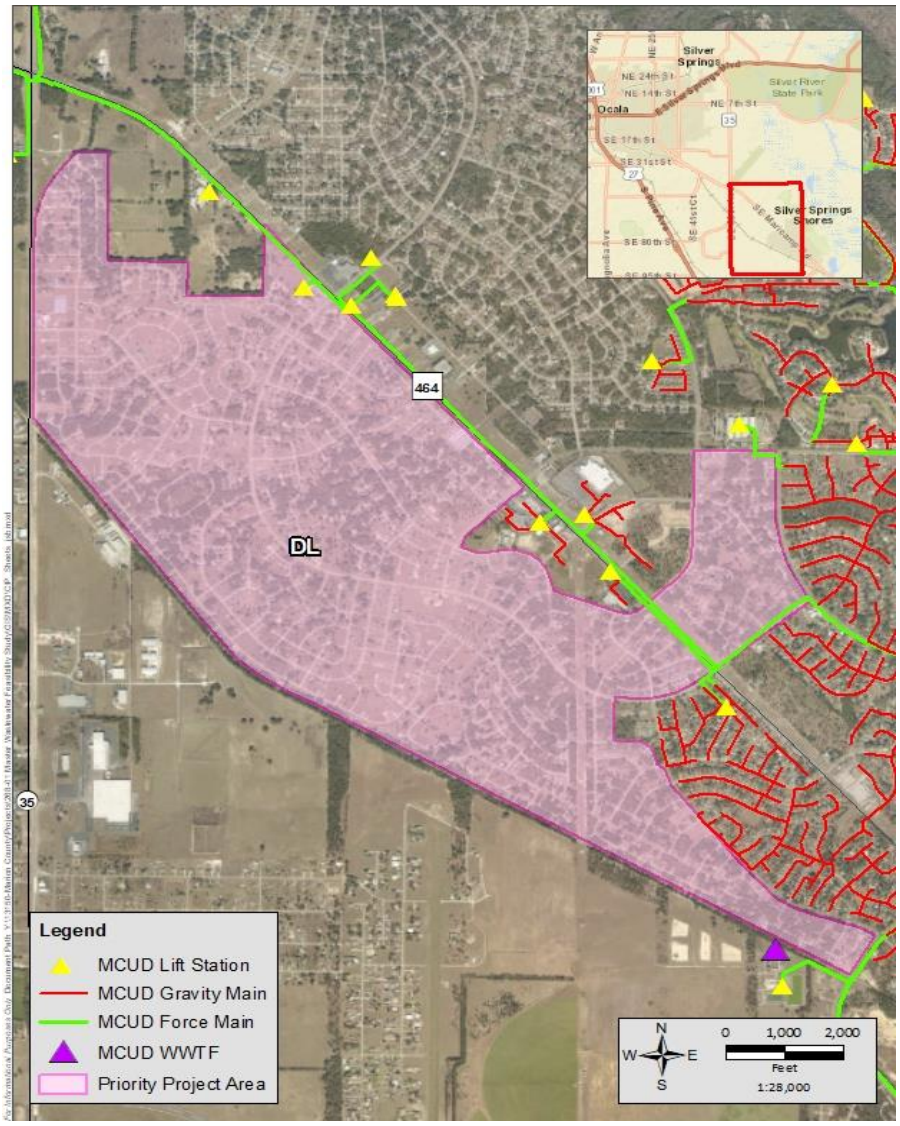
No. of OSTDS
1,414

No. of Total Lots
3,150

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 79,958,032**
Cost per Lot	**$ 25,384**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DL Phase 2

Predecessor CIP: PPA DL Phase 1

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (5) five lift stations will be constructed and discharge through a common force main to an existing force main on SE Maricamp Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
3,975 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 5
To: Year 10

PROJECT DETAILS

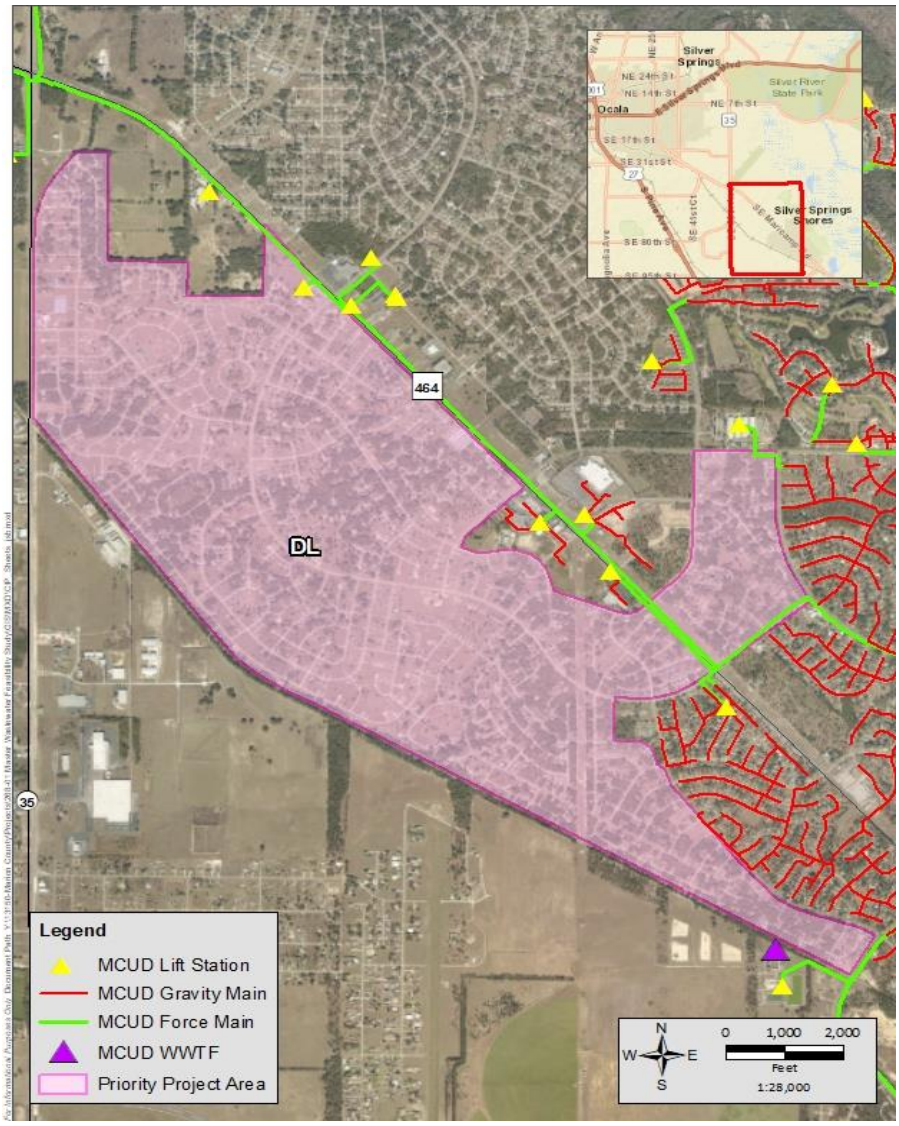
No. of OSTDS
447

No. of Total Lots
996

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 25,281,968**
Cost per Lot	**$ 25,384**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DH

Predecessor CIP: None

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (5) five lift stations will be constructed and discharge through a common force main to an existing force main on Baseline Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
13,172 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 5
To: Year 10

PROJECT DETAILS

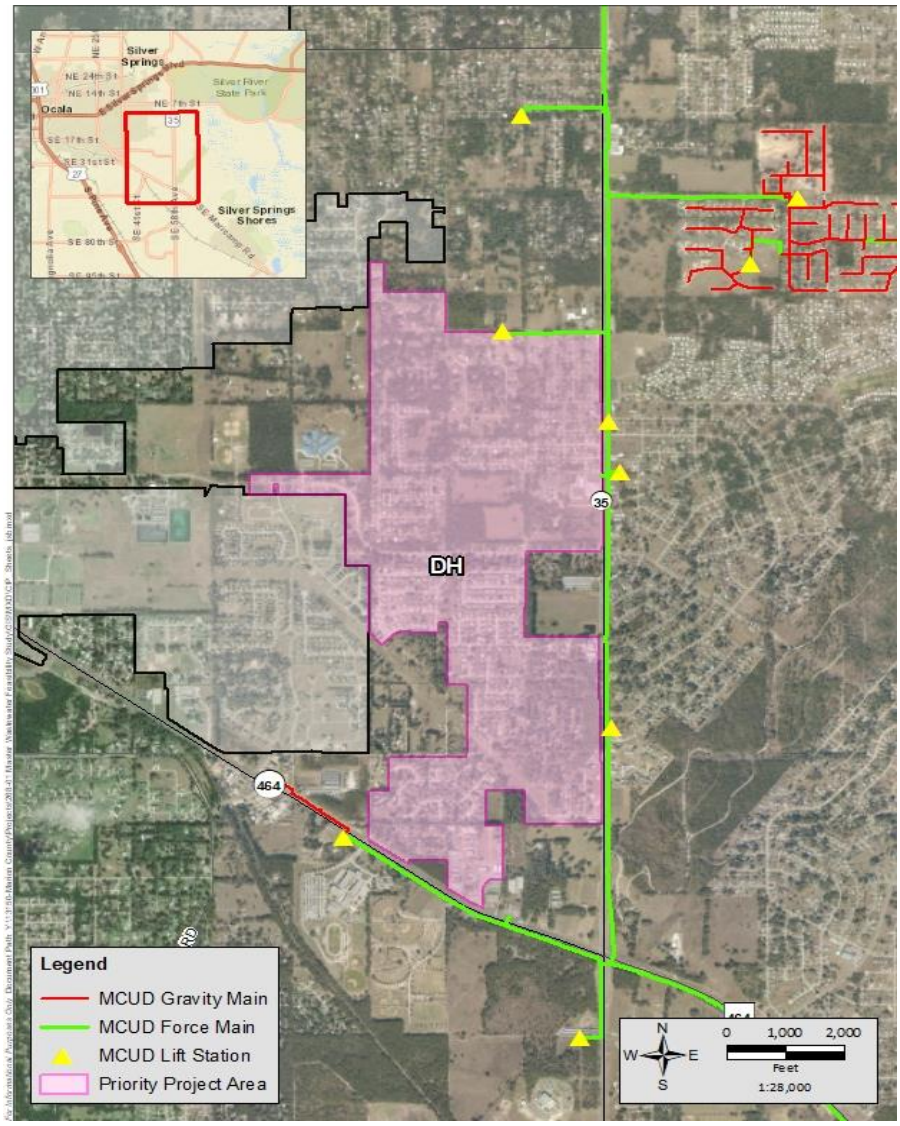
No. of OSTDS
1,108

No. of Total Lots
1,311

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 41,557,000**
Cost per Lot	**$ 31,699**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DI Phase 1

Predecessor CIP: None

WWTP Service Area: SSS WRF

DESCRITPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (2) two lift stations will be constructed and discharge through a common force main to an existing force main on Baseline Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
6,433 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 5
To: Year 10

PROJECT DETAILS

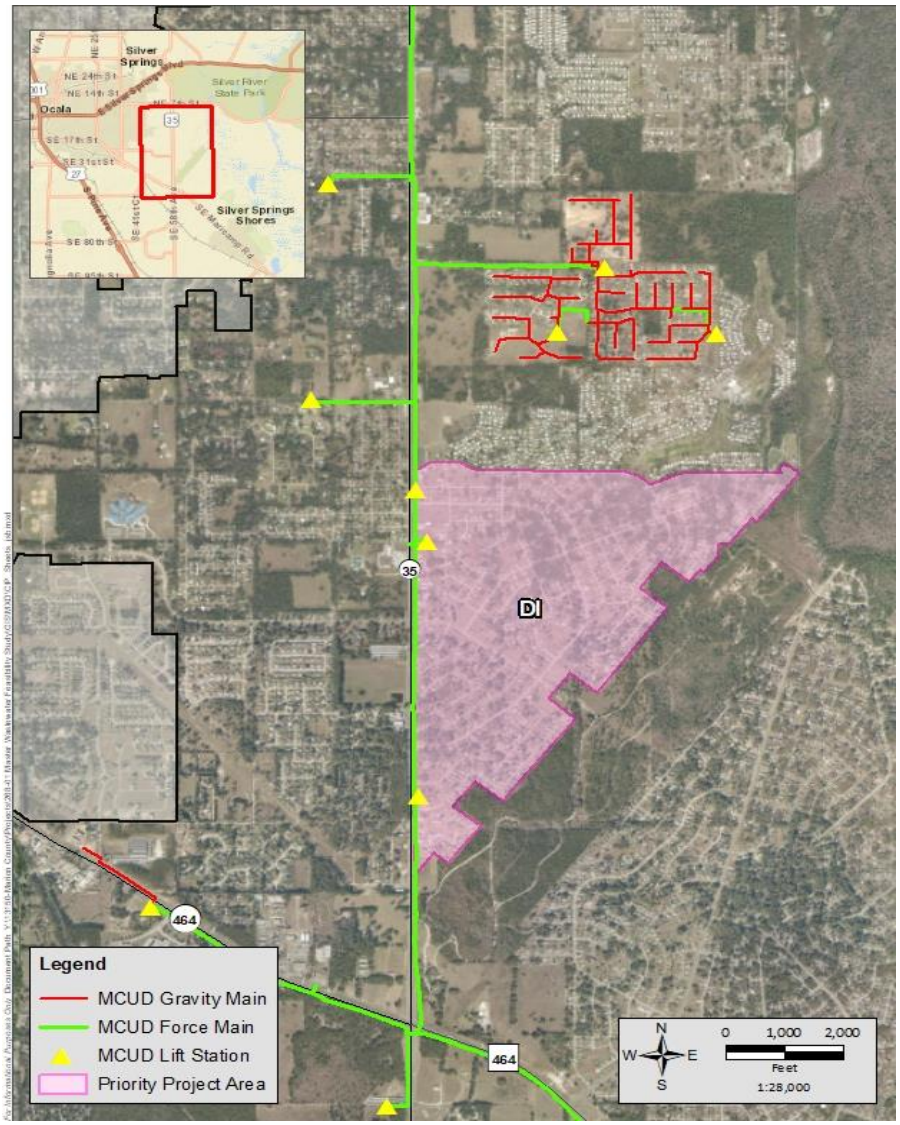
No. of OSTDS
749

No. of Total Lots
943

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 23,399,294**
Cost per Lot	**$ 24,814**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DI Phase 2

Predecessor CIP: PPA DI Phase 1

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (2) two lift stations will be constructed and discharge through a common force main to an existing force main on Baseline Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
3,745 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 10
To: Year 15

PROJECT DETAILS

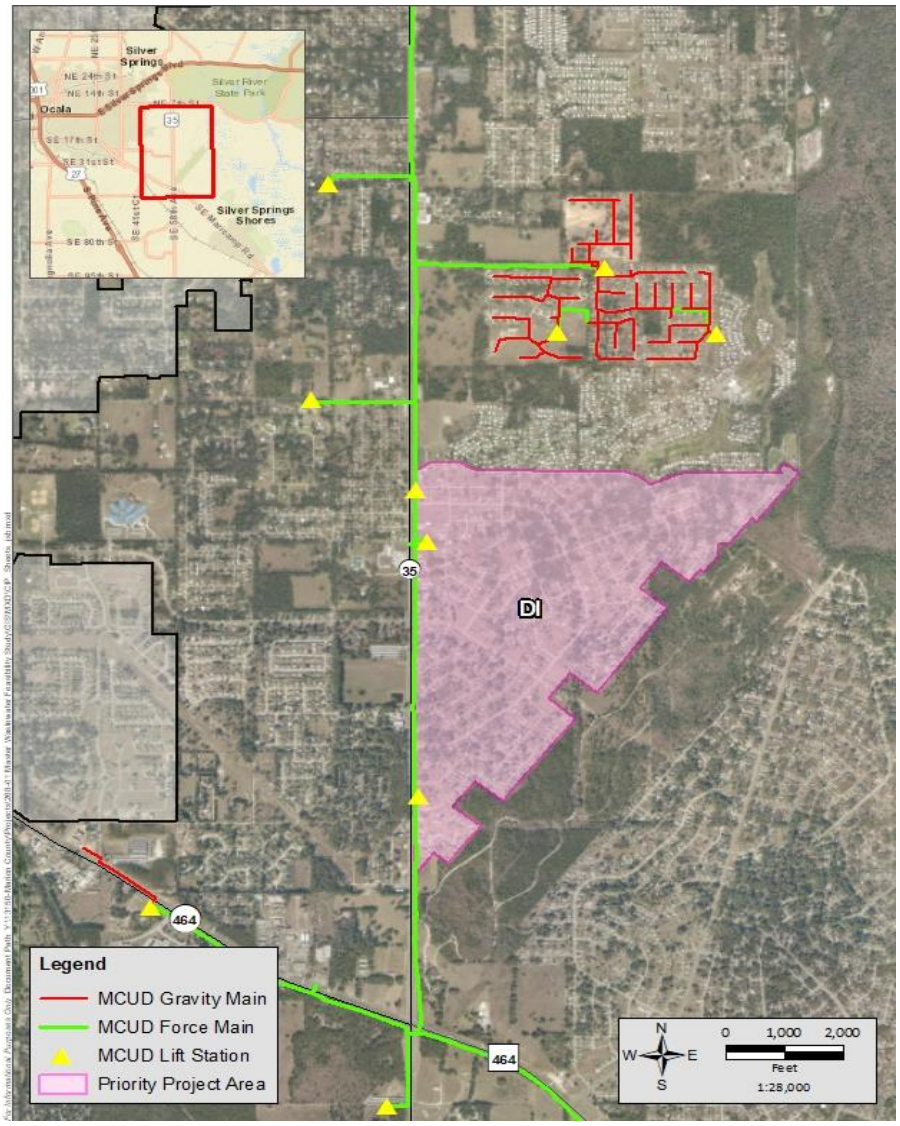
No. of OSTDS
436

No. of Total Lots
549

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 13,622,706**
Cost per Lot	**$ 24,814**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **PPA DK - Phase 1**

Predecessor CIP: **None**

WWTP Service Area: **SSS WRF**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (9) nine life stations will be constructed and discharge through a common force main to an existing force main at Pine Road and SE Maricamp Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
14,075 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 10
To: Year 15

PROJECT DETAILS

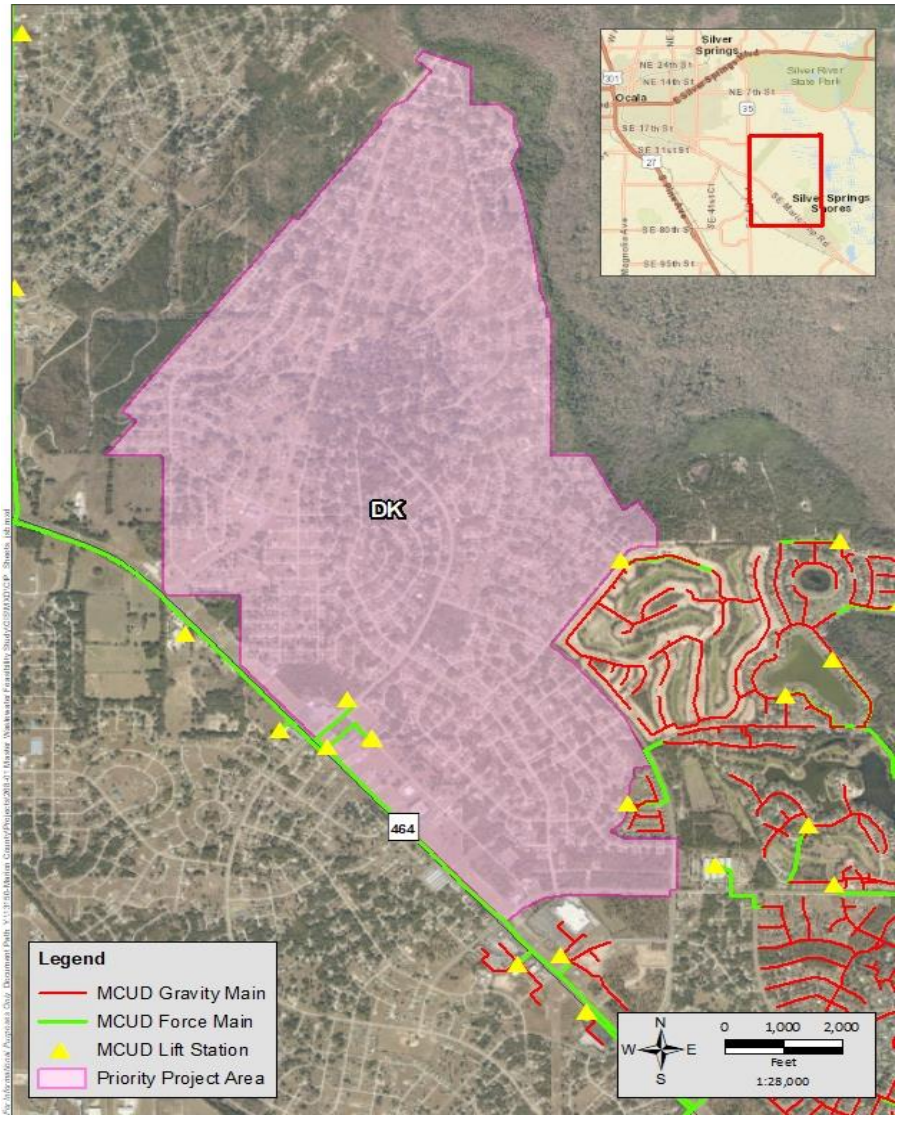
No. of OSTDS
1,678

No. of Total Lots
2,701

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 48,042,440**
Cost per Lot	**$ 25,871**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DK - Phase 2

Predecessor CIP: PPA DK - Phase 1

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (4) four lift stations will be constructed and discharge through a common force main to an existing force main at Pine Road and SE Maricamp Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
9,677 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 15
To: Year 20

PROJECT DETAILS

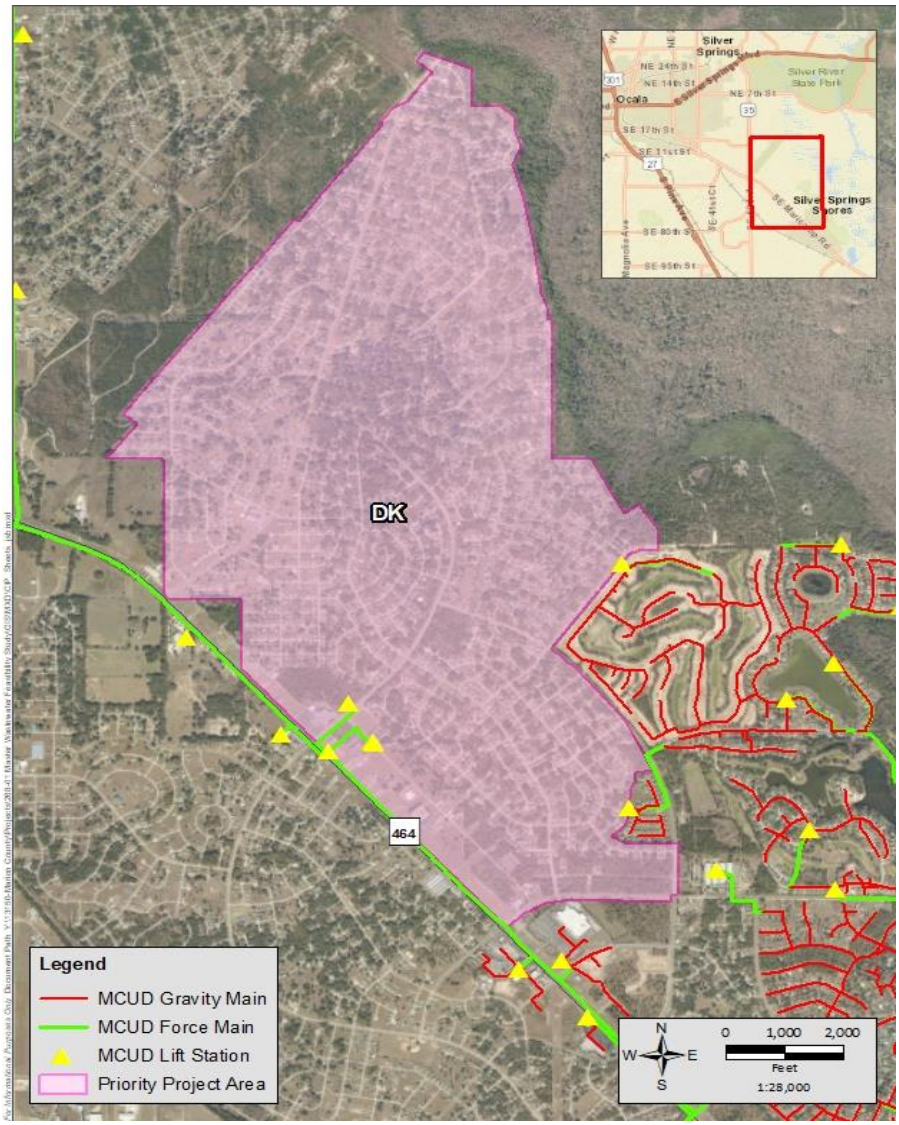
No. of OSTDS
1,153

No. of Total Lots
1,857

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 33,839,263**
Cost per Lot	**$ 25,871**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: PPA DC

Predecessor CIP: None

WWTP Service Area: SSS WRF

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The (5) five lift stations will be constructed and discharge through a common force main to an existing force main on Baseline Road.

ENVIRONMENTAL DETAILS

Nitrogen Load Reduction
6,860 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 15
To: Year 20

PROJECT DETAILS

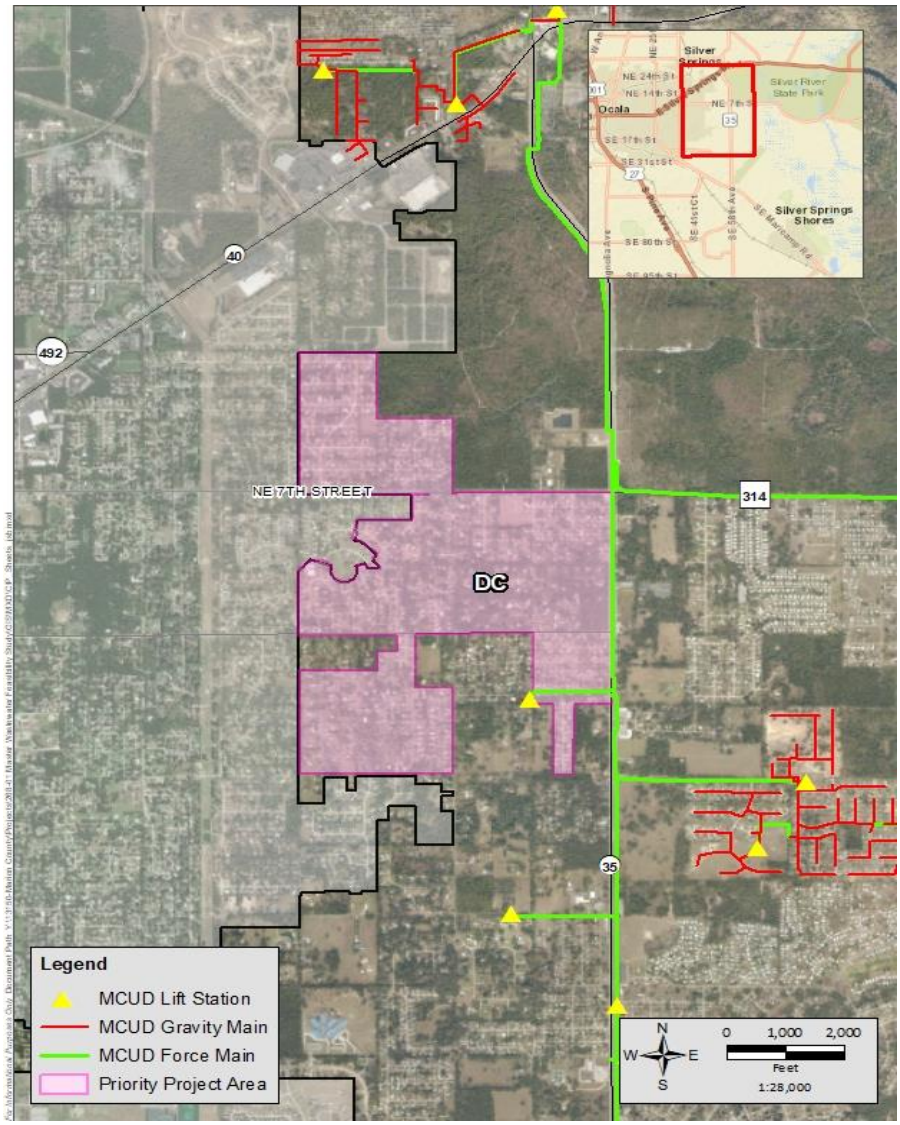
No. of OSTDS
929

No. of Total Lots
1,046

Force Main Length (Size)
28,444 (8")

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [x] Gravity Mains



Project Cost Estimate

Engineer's Opinion of Probable Construction Cost	**$ 33,757,000**
Cost per Lot	**$ 32,272**

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **SSS-032 Upgrade**

Predecessor CIP: **None**

WWTP Service Area: **SSS WRF**

DESCRIPTION: The project includes an upgrade at the SSS-032 to increase volume of storage in the wet well in conjunction with a new, short tie-in FM to bypass FHS-002 and send flow directly to EQB-001.

HYDRAULIC DETAILS

Reduce re-pumping by
up to 684,000 gpd

PROJECT NEED

- [x] Diverts flows to another WWTP
- [x] Increase capacity to accommodate future flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 1
To: Year 5

PROJECT DETAILS

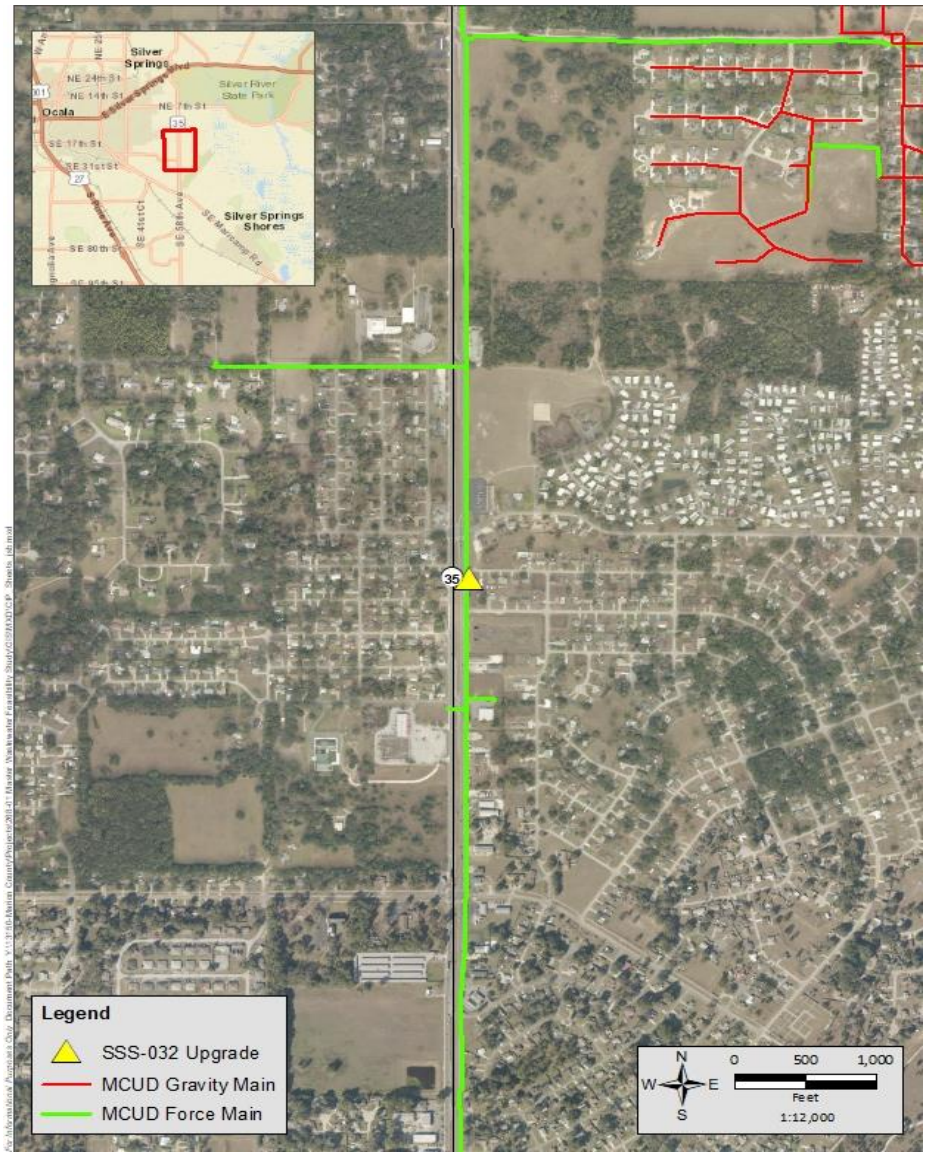
Force Main Length
20'

Force Main Material
PVC

Force Main Size
12"

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [ ] Gravity Mains



Estimated Project Costs

Engineer's Opinion of Probable Construction Cost	$	1,750,000

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: EQB-001 Bypass FM and Pump Upgrades

Predecessor CIP: None

WWTP Service Area: SSS WRF

DESCRIPTION: The project includes the construction of 5,500 LF of 16-inch FM along Maricamp Road, connecting the existing 12"-inch FM to the SSS WRF. (1) one pump modification and (6) six pump upgrades are proposed due to the increased head conditions from the new bypass: pump modification at FHS-002 and pump upgrades at CAS-001, FHS-001, SSS-009, SSS-025, SSS-032, and WMT-002.

HYDRAULIC DETAILS

Eliminated re-pumped flows & upgrade to higher head pumps

PROJECT NEED

- ☐ Diverts flows to another WWTP
- ☑ Increase capacity to accommodate future flows
- ☑ Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 6
To: Year 10

PROJECT DETAILS

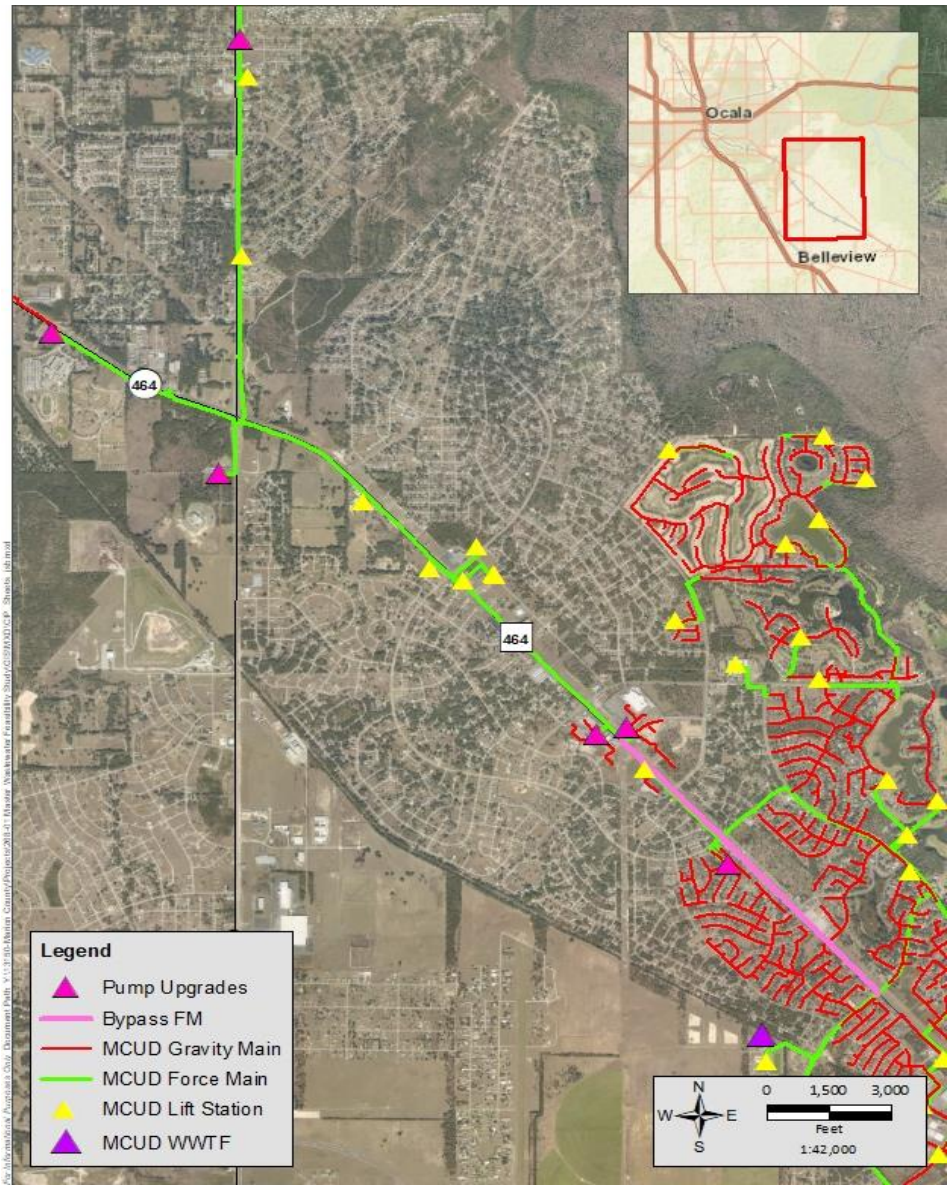
Force Main Length
5,500'

Force Main Material
PVC

Force Main Size
16"

PROJECT COMPONENTS

- ☑ Pump Station
- ☑ Force Mains
- ☐ Gravity Mains



Estimated Project Costs

Engineer's Opinion of Probable Construction Cost	$	1,500,000

(Costs expressed in 2020 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **SE 58th Avenue FM Upgrade**

Predecessor CIP: **PPA DH, PPA DI**

WWTP Service Area: **SSS WRF**

DESCRIPTION: The project includes an upgrade to the existing 8-inch FM along SE 58th Avenue, from the PPA DI project point of connection to the existing 12-inch FM on Maricamp Road, to handle additional flows from the PPA DH and PPA DI projects.

HYDRAULIC DETAILS

FM Capacity Improvement

475 gpm to 1050 gpm

PROJECT NEED

- ☐ Diverts flows to another WWTP
- ☑ Increase capacity to accommodate future flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

From: Year 11

To: Year 15

PROJECT DETAILS

Force Main Length
5,250'

Force Main Material
PVC

Force Main Size
12"

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Gravity Mains

Estimated Project Costs

Engineer's Opinion of Probable Construction Cost	$	600,000

(Costs expressed in 2020 dollars)