City of Polk City
123 Broadway Blvd
Polk City, FL 33868
Phone: 863.984.1375
Fax: 863.984.2334

March 14, 2025

Dear Congressman Webster,

On behalf of Polk City, I am writing to express my full support for the Polk City Wastewater Improvement Community Project Funding application. This request will provide facility upgrades to the wastewater collection system delivered to Cardinal Hill Wastewater Treatment Facility located in Polk City, Florida.

I support this project, which will fund the lining of 30,000 linear feet of piping, which will extend the lifetime of the current failing piping and increase capacity for approximately 1,600 people. If funded, this project will significantly improve community resiliency by installing adaptive infrastructure which will ensure continued operation during peak wet and dry seasons, and climate events.

Ultimately, this funding request will protect public health, improve the environment of the Green Swamp Area of Critical State Concern, and increase water quality by effectively managing and cleaning wastewater before it is released back into natural ecosystems.

Thank you in advance for your consideration and inclusion of this vital project to my local community as well as the at-large Florida ecosystem in you FY26 list of Community Project Funding.

If you request any further information or would like to discuss this project in more detail, please do not hesitate to contact me or our Washington, D.C. representative, Blair Hancock, directly.

Sincerely,

Joe LaCascia

Polk County Utilities Customers to See Rate Increases for Water, Sewer Services

Special to the News | Last updated Sep 30, 2024 9:55am

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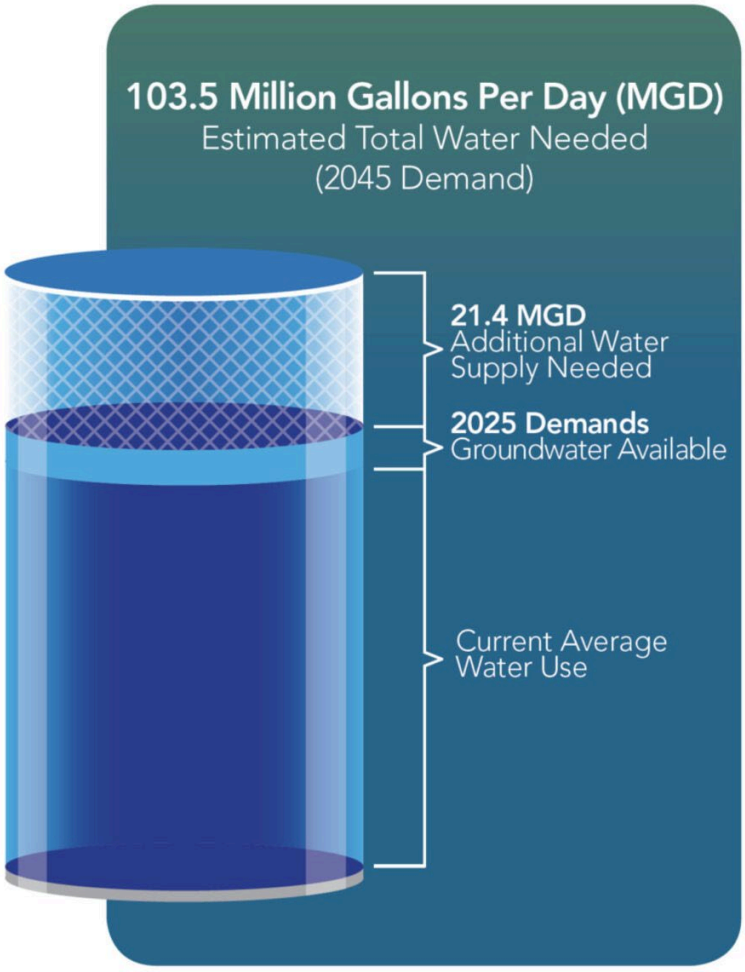
Polk County Utility customers will see an increase in their cost of water and sewer bills starting today. Water and wastewater rates have been increased by 6% beginning Oct. 1.

According to county spokesperson Jeff Foley, "the surcharge assessed on water usage and reclaimed water usage also will increase, as will connection fees. The increases are necessary to allow the county to meet its current and future water demands."



Courtesy Polk Regional Water Cooperative

Increasing demand for water is requiring area cities and Polk County Utilities to cooperate on a massive water project to desalinate briny water from deep below the surface. The project is expected cost more than $1 billion.

The increase is the first that Polk County Utilities Division has implemented since 2019.

The surcharge assessed on water usage (amount added to bill on top of standard rate, based on use) will also increase by $0.25/1,000 gallons each year from October 2024 through October 2028.

The new increases will also affect water re-use systems, which offer treated water for irrigation purposes. Those 'purple pipe" systems are only available in limited areas of the county.

"Using reclaimed water is another conservation effort used by Polk County," Foley said in a statement. "Reclaimed water is highly-treated wastewater that is distributed to homes for use as irrigation water. For every gallon of water that is reclaimed, that is one less gallon of water that needs to be taken from the aquifer, allowing more to be used for drinking water and indoor use."

Polk County is investing heavily in the Polk Regional Water Cooperative, joining a dozen Polk cities in developing a network of pipelines, wells, and a desalinating plant that will combine to draw brackish water from the sub-Floridan aquifer deep below the earth. After treatment, the water will be piped from a facility east of Lake Wales to cities and their customers from Davenport to Bartow.

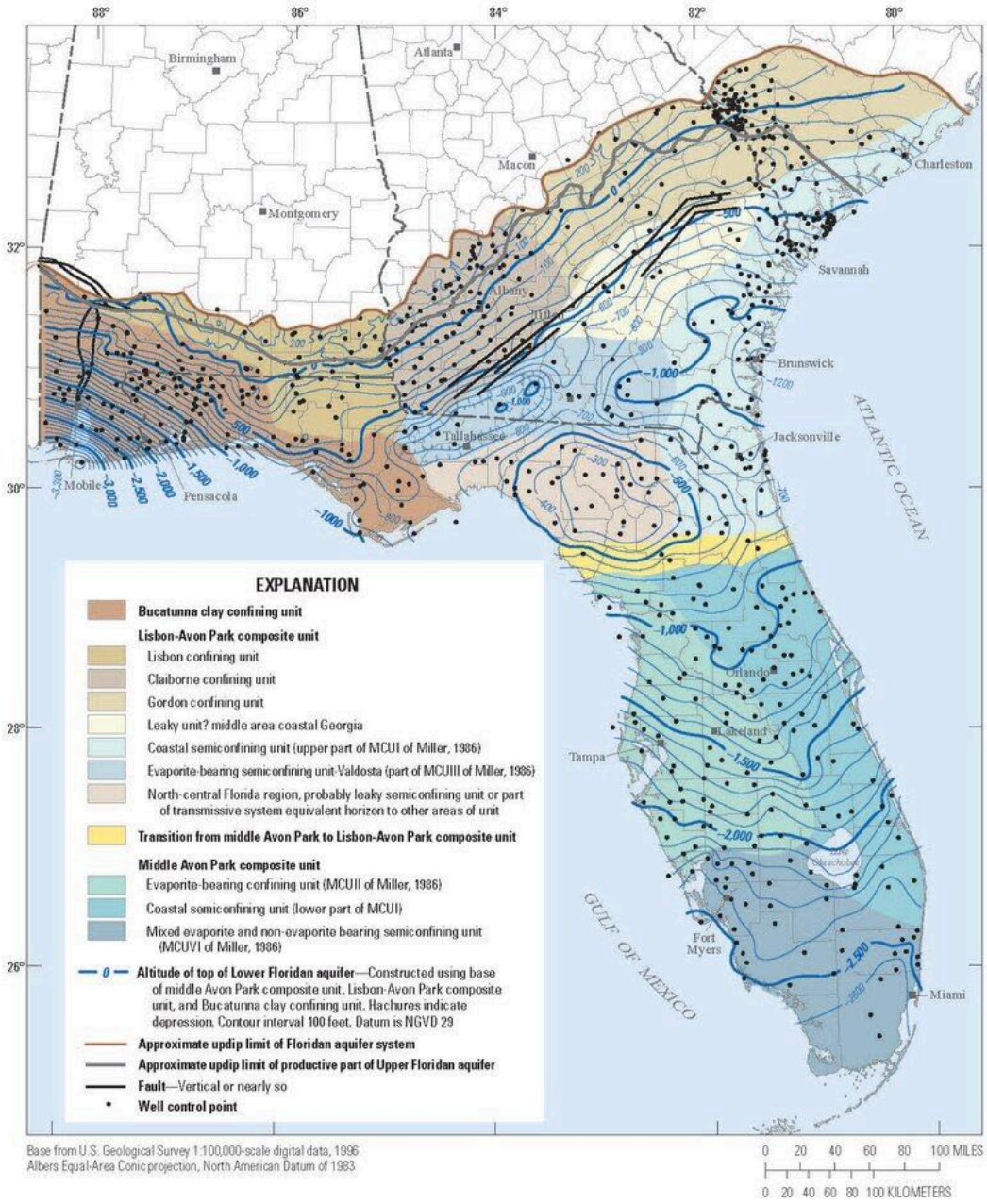


Figure 44. Altitude of the top of the Lower Floridan aquifer and overlying units, southeastern United States.

The over-stressed Floridan Aquifer has reached the limit of its capacity for withdrawals, requiring area utlities services to find other sources of drinking water.

The huge project, expected to cost well over a billion dollars, has been directed by the Southwest Florida Water Management District in response to growing demand which is causing serious declines in the levels of the sweet Floridan Aquifer. No increased withdrawals will be permitted from that long-time source, which serves most of peninsular Florida.

Consumers are advised to consider several ways they can mitigate the increased costs of water by reducing their consumption. Those suggestions include:

- Install low-flow toilets and shower heads.

- Check washing machines, toilets and pipes often for leaks.

- Do not let water run needlessly.

- Turn off the water when you're brushing your teeth.

- Invest in water-saving appliances.

- Modify landscapes to feature Florida-friendly plants and grass.

- Invest in rain sensors or smart irrigation timers.

For more information, visit https://www.polk-county.net/how-floridas-water-dilemma-is-impacting-polk-utilities-rates/.

TECHNICAL SUMMARY

Project: Cardinal Hill Consent Order Management and Tracking
Client: Polk City
Subject: Wastewater Alternatives Analysis for Polk City (FLA489093)
Date: November 11, 2024
CSDG No.: 354-001000

Influent Challenges:

Polk City owns and operates an existing extended aeration Wastewater Treatment Facility (WWTF) known as the Cardinal Hill WWTF. The facility was designed and constructed from 2005-2008 with the intent that the facility is temporary until the larger, more complex, regional facility could be designed and constructed. The facility is presently rated at 0.300 million gallons per day (mgd) on an average annual daily flow (AADF) basis through the Florida Department of Environmental Protection (FDEP, permit FLA489093). The facility presently receives 0.172 mgd AADF with significant fluctuations in flow and elevated levels of nutrients. **Table 1** presents the present inflow characteristics of the wastewater received as compared to the permitted capacities with the nutrients presented in milligrams per liter (mg/l) concentration. Please note that Peak Hour Flow (PHF) information is not available for the Cardinal Hill WWTF, and it has been assumed that it is likely 1.5x Maximum Daily Flow (MDF). The permitting is based on AADF, Maximum Monthly Flow (MMF), and PHF calculations. The discharge permit allows for higher nutrient values for effluent on MDF while other processes such as the bar screen at the influent designed for PHF.

Table 1: Polk City Cardinal Hill Wastewater Characterization

	Flow (mgd)	**TKN (mg/l)**	**BOD5 (mg/l)**	**TSS (mg/l)**
Actual AADF	0.172	**62**	144	295
Actual MMF	0.251	**70**	167	500
Actual MDF	**0.760**	**90**	**259**	**800**
Expected PHF	**1.520**	NA	NA	NA
Permit AADF	0.300	40	200	200
Permit MMF	0.375	**40**	**200**	**200**
Permit MDF	0.600	**40**	**200**	**200**
Permit PHF	**0.750**	NA	NA	NA

TKN = Total Kjeldahl Nitrogen, adding ammonia and organic nitrogen

BOD5 = 5-day Biochemical Oxygen Demand
TSS = Total Suspended Solids

Polk City discharges its disinfected effluent from the Cardinal Hill WWTF to three separate permitted facilities, the I-4 Rapid Infiltration Basins (RIBs), the Smith Road RIBs, and the on-site Cardinal Hill spray field. Each has a rated capacity and effluent limitations, with similar limitations placed on their monitoring wells. **Figure 1** shows the location of the effluent disposal sites and the Cardinal Hill WWTF. **Table 2** presents the effluent concentration limits for the three effluent sites as permitted by the FDEP along with actual values observed. The flow limits are AADF, only, with limitation of 0.300 mgd at Smith Road, 0.100 mgd at I-4, and 0.070 mgd at Cardinal Hill, respectively. Presently, with the effluent having issues they are limited to only the 0.100 mgd at I-4 and 0.070 mgd at Cardinal Hill or 0.170 mgd AADF. As neither location was being utilized for effluent prior to March 2024, they are not expected to exceed their rated capacities until near March of 2025.

Table 2: Polk City Effluent Quality and Permit Limits

	Flow (mgd)	**pH**	**Fecal Col. (#/100 ml)**	**Nitrate-N (mg/l)**	**BOD5 (mg/l)**	**TSS (mg/l)**
Actual Average	0.172	NA	54.15 (2/28/22)	0.3	**29.95** (4/30/22)	**28.48** (9/30/22)
Actual Max Month	NA	NA	NA	0.3	**78** (04/30/22)	**89** (07/31/22)
Actual Max	NA	6.9-8.5	**1180** (03/31/21)	**17.1** (09/30/2021)	**151** (04/30/22)	**160** (07/31/22)
Permit Average	0.30+0.10+0.07 = 0.470	NA	200	NA	**20**	**20**
Permit Max Month	NA	NA	NA	NA	**30**	**30**
Permit Max	NA	6-8.5	**800**	**12**	**60**	**60**

The facility was not meeting effluent requirements frequently and for an extended period. Since at least 2020, limits for BOD5, Fecal Coliform counts, and TSS have been exceeded with Maximum, Monthly Average, and Annual Average exceeded. While the maximum Nitrates were exceeded, that has been infrequent. Based on sampling information, the pH has not had issues during the subject period. The low nitrates typically came when the facility wasn't converting as much nitrogen from TKN to Nitrates, and total nitrogen in the effluent were significant with effluent being measured as high as influent (90 mg/l). The City has updated their treatment to more closely monitor solids within their facility and they are, temporarily, achieving simultaneous nitrification-denitrification (Nite-DeNite). This allows for the conversion of the influent TKN to Nitrates near the aeration header, but away from the header where there is virtually zero dissolved oxygen the Nitrates are consumed by the organisms present.

Effluent Disposal:

The Smith Road RIBs were constructed in a remote area of Polk City, close to existing wells, with over 71 wells being between 200 feet and 500 feet from the RIBs. This was permitted assuming the effluent qualities in the permit would be met. However, with the high nutrients and unoxidized nitrogen in the effluent, it has led to nitrogen infiltrating into the RIB. The high nitrogen appears to have caused groundwater levels of Nitrate to climb and other items previously present to spread. **Table 3** presents the groundwater issues, specifically at Smith Road as they are the largest RIBs with the slowest percolation rate. Please note that some metals with only "reportable" values were not presented.

Table 3: Smith Road Compliance Monitoring Well Quality and Permit Limits

	pH	Fecal Col. (#/100 ml)	Nitrate-N (mg/l)	Cadmium (ug/l)	Lead (ug/l)
Actual Max	**5.7**-8.3 (12/31/21)	**200** (03/31/22)	**17.7** (06/30/23)	**5.2** (06/30/21)	**23.7** (9/30/22)
Permit Max	6-8.5	**4**	**10**	5	**15**

The excessive loading, and the potential issues with utilizing the Smith Road RIBs in the future, have led the City to pursue replacing the existing WWTF with a new facility capable of treating nitrogen through multistage biological processes. As an alternative, the City of Lakeland has existing wastewater mains only 1,500 feet from the edge of the Polk City wastewater collection system. Polk City has engaged speaking with them. Due to the complexity of the issues, it is estimated that the replacement Cardinal Hill WWTF may cost approximately $30 - $40 per gallon of treatment capacity. That amount excludes the purchase of real property and demolition of the existing facility that has outlived its useful life. To calculate the needs for the facility for the coming 20-year forecast period, CivilSurv reviewed all proposed zoning and future land use that was not yet developed. Additionally, CivilSurv considered specific areas that have a high density and potential for "septic to sewer" connection infill. Based on that evaluation, the following presents the expected wastewater growth through the planning year 2045. The growth rates are based on current BEBR forecasts with 9-11% per 5 year period. **Table 4** presents the anticipated wastewater growth based on both the infill and new developments along with total anticipated if all future land use meets potential growth. The peaking factors are based on those seen during present day.

Table 4: Polk City Cardinal Hill Wastewater Flow Projections

Year	AADF (mgd)	MDF (mgd)	PHF (mgd)
2024	0.172	0.850	1.275
2030	0.220	1.094	1.640
2035	0.277	1.377	2.065
2040	0.345	1.715	2.572

2045	0.415	2.063	3.094
Buildout	0.668	3.321	4.481

As noted in prior sections, the peaking factors are extremely high and within the wet season. Due to that reason, and outside of the issues related to waste strength, it is recommended Polk City undergo an Inflow and Infiltration (I&I) Elimination Program. That can be accomplished by reviewing the period lift stations run during "dry" periods and comparing to the time they run during "wet" periods. The next step is to clean and CCTV the sewer mains to review of cracks and leaks in accordance with NASSCO recommendations. **Figure 2** shows the location of some of the older wastewater collection systems within Polk City, formerly known as the Mount Olive system. Typical projects that are created from the review program is pipes and manholes are lined, repaired, or otherwise updated to prevent the severe I&I. When the program is completed, this should drop the peaks to a more predictable level. Based on the Recommended Standards for Wastewater Treatment, 2014 edition and based on the population, the wastewater flow projections should yield those presented in **Table 5**.

Table 5: Polk City Cardinal Hill Wastewater Flow Projections Post I&I

Year	AADF (mgd)	MDF (mgd)	PHF (mgd)
2024	0.172	0.385	0.526
2030	0.220	0.495	0.677
2035	0.277	0.623	0.852
2040	0.345	0.690	1.062
2045	0.415	0.830	1.159
Buildout	0.668	1.336	1.866

Based on the flowrates expected and presented in **Table 5**, the Cardinal Hill WWTF should be replaced with an advanced secondary wastewater treatment facility rated at approximately 0.350 mgd or a pump station with PHF capacity. That would allow the facility to operate for at least 10 years prior to requiring an expansion and, if the I&I work reduces total flows or the septic to sewer infill is delayed, potentially up to 20 years. The headworks should be rated for the potential buildout flow and a surge tank would be required. That would allow the facility to expand, adding a second parallel treatment system after the headworks in the future. As the complete facilities are presently being modeled and calculated, we are utilizing existing book data for similar sized facilities and similar complexity to calculate the costs. Please note that these facilities must include high level disinfection, online monitoring of turbidity for checking TSS, and online monitoring of pH and chlorine within the effluent. The removal rates are challenging without adding additional processes that don't presently exist, such as anoxic basins. This would allow Polk City reduce the elevated TKN to below 10 mg/l as total nitrogen in effluent with the goal of reducing the 3 mg/l (Advanced Wastewater Treatment limits). Without those processes, limited removal of Nitrogen is expected reliably through solids assimilation and small Nite-Denite at approximately 20-30 mg/l. The

plant must have Modified Luzack Ettinger with or Anoxic Oxic Anoxic Oxic (AOAO) or capabilities. Without those capabilities built-in, the facility will struggle to meet permit limit just as it does today. **Figure 3** demonstrates the differences in these types of treatment methods with process flow diagrams. **Table 6** provides planning level estimates for potential costs for the replacement Cardinal Hill WWTF. It should be noted that this does not consider effluent disposal which we know will be challenging as the majority of Polk City is within the Green Swamp Area of Critical State Concern (ACSC) and there are limited locations that can percolate water rapidly enough. Further, as new areas within the City have grown and developed, there isn't a "reclaimed water" user base within the City. Creating a user base for reclaimed water will be extremely challenging after the area is built out. As the City already has a fully developed reclaimed user base, this is far simplified by the connection with them.

Table 6: Opinion of Construction Costs Based on Capacity, Only, For New WWTF

Element	Design and Construction Costs/Gallon	Probable Costs
WWTF – 0.350 Low	$30	$10,500,000
Headworks/Splitters – 0.700 Low	$5	$3,500,000
Demolition – Existing Low	$1	$300,000
Total		**$14,300,000**
WWTF – 0.350 High	$40	$14,000,000
Headworks/Splitters – 0.700 High	$8	$5,600,000
Demolition – Existing High	$2	$600,000
Total		**$20,200,000**

Based on the above, it is estimated that the new facilities will likely cost between $14,300,000 and $20,200,000 excluding costs for the Consent Order and effluent disposal. Effluent disposal could easily cost a $2-$5 million dollars due to property acquisition, design, and permitting costs for the land. Additionally, the more complicated wastewater facility will likely require additional staffing and will cost more to operate than the existing.

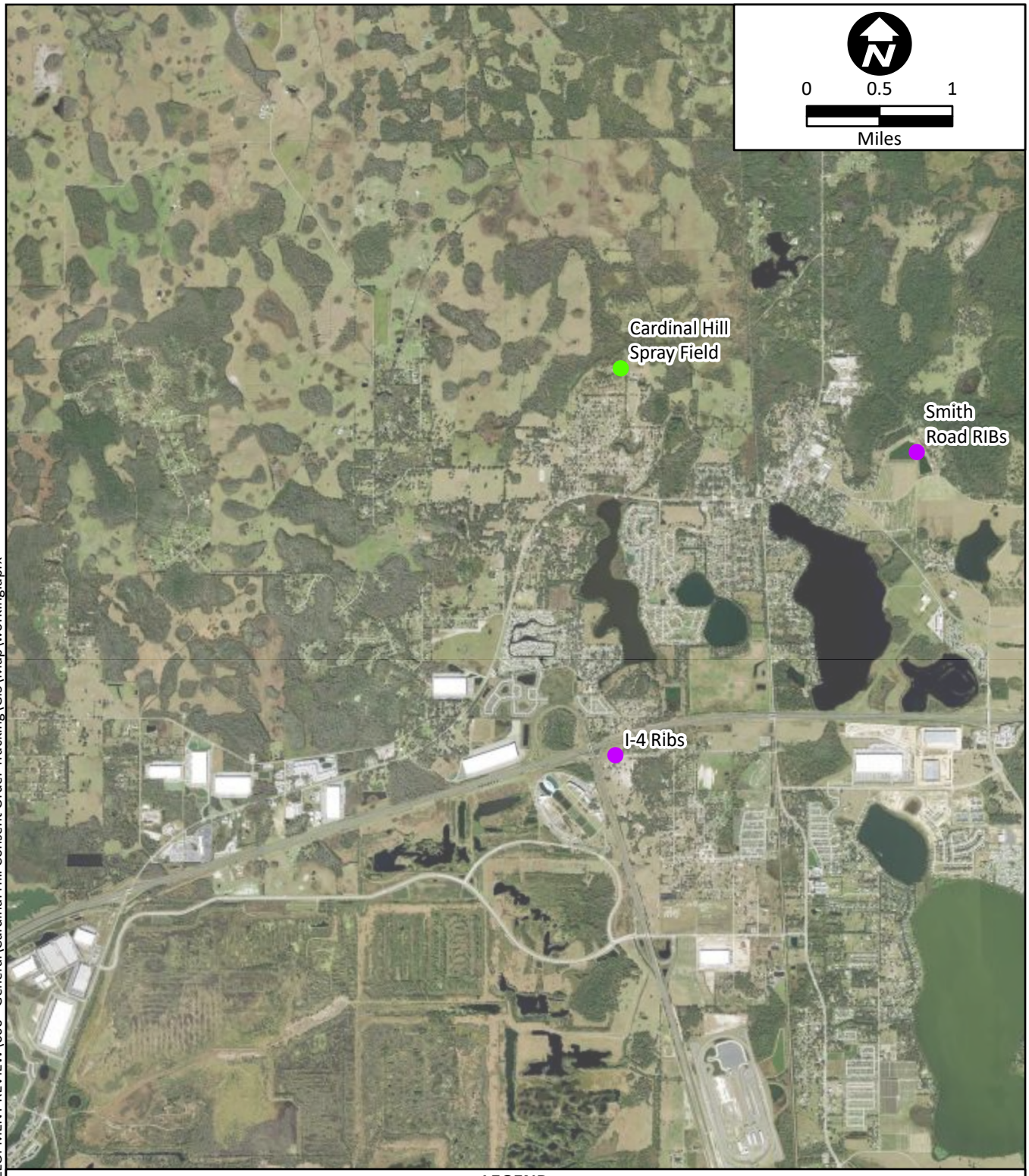
An alternative to **Table 6** is the option to purchase wastewater treatment through a bulk agreement with the City of Lakeland. Through this agreement, Polk City would need to construct a new lift station, pay for upgrades to Lakeland's system via a large diameter pipeline that would convey wastewater that may be utilized in the future or for other projects, and pay for the connection fees (aka impact fees) to the City's North Wastewater Treatment Facility. Discussions with the City indicated they had significant available capacity (greater than 4 mgd AADF available) but the capacity was reserved for a "High Tech Corridor" that may be constructed adjacent to Polk City and Florida Polytechnic University. The wastewater generated would only be a fraction of that available from Lakeland. Additionally, the costs for the construction of the force main may be decreased if the facility could be constructed near proposed development in the southwest corridor of Polk City. **Table 7** presents the potential costs for connection to

the City of Lakeland's North Wastewater Treatment Facility located onsite with their McIntosh Power Plant north of Lake Parker. While the below costs would increase the costs for operation by the amount for the payment to the City of Lakeland, it would eliminate the costs for disposal and operation of the existing facilities. Of large benefit is the City of Lakland has an existing, fully utilized, reclaimed water system that is used at the McIntosh plant, 7 wetlands, and TECO's Polk Power Station. By having their effluent utilized as an Alternative Water Supply, this should allow Polk City more latitude to defend their current and projected consumption rates for potable water. **Figure 3** demonstrates the proximity of the Polk City collection system and a couple locations where the lift station could be constructed, leading to the costs described.

Table 7: Opinion of Construction Costs Based on Capacity, Only, For Lakeland Connection

Element	Design and Construction Costs	Probable Costs
Connection Fees 0.350 - Low	$4,400 / 260 gallons	$5,923,000
Lift Station and Backup Power Low	$7/gallon	$2,450,000
Demolition – Existing Low	$1/gallon	$300,000
New Force Main 10" – Low – 1,500 ft	$200/feet	$300,000
Upgrade Lakeland FM – 10" Eq, 14,500 ft Low	$200/feet	$2,900,000
Total		**$11,873,000**
Connection Fees 0.350 - High	$5,000 / 260 gallons	$6,730,000
Lift Station and Backup Power High	$10/gallon	$3,500,000
Demolition – Existing High	$2/gallon	$600,000
New Force Main 10" – High – 15,000 ft	$200/feet	$3,000,000
Upgrade Lakeland FM – 10" Eq, 14,500 ft Low	$200/feet	$2,900,000
Total		**$16,730,000**

While the two options presented appear to have an overlapping capital cost, there is far less risk in **Table 7** costs as it includes effluent disposal. Additionally, this would allow the repurposing and sale of effluent disposal land and some of the wastewater facility land owned by Polk City. Finally, as noted above, **Table 7** costs decrease costs for the operation of the wastewater treatment facility with regard to power, chemicals, and personnel. Please note that these options anticipate the use of some sort of flow peaking decrease through I&I reduction as the present peaks appear too high to handle with either a new wastewater treatment facility of the capacity rated or a pumping station and force main. Finally, by sending the wastewater to Lakeland the effluent disposal will not be within the Green Swamp ACSC.



LEGEND

- Cardinal Hill WWTF
- Effluent Disposal Sites

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POLK CITY

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FIGURE 1

CARDINAL HILL WWTF AND EFFLUENT DISPOSAL SITES

DATE: NOVEMBER 2024
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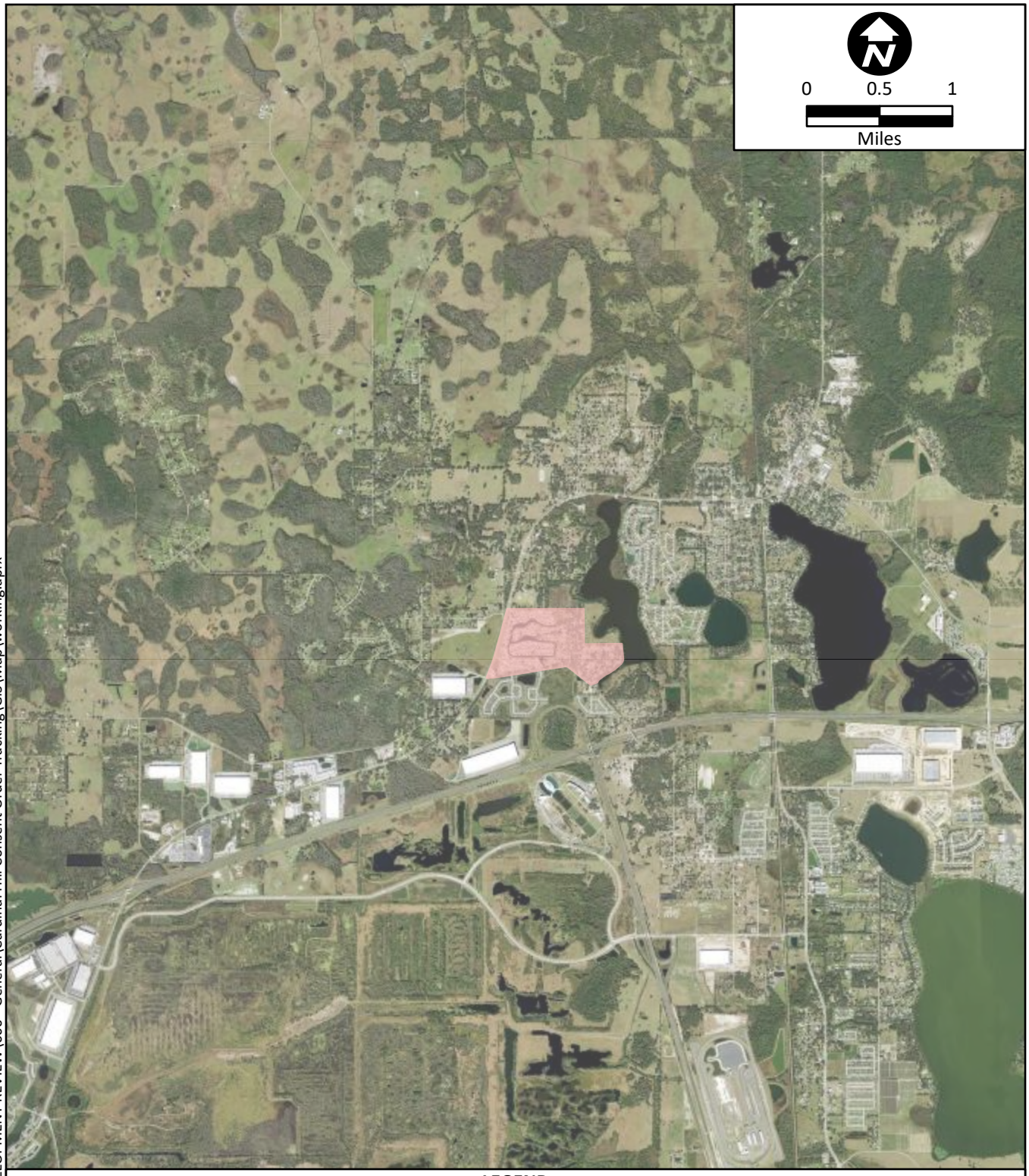

LEGEND

Older Wastewater Collection Area

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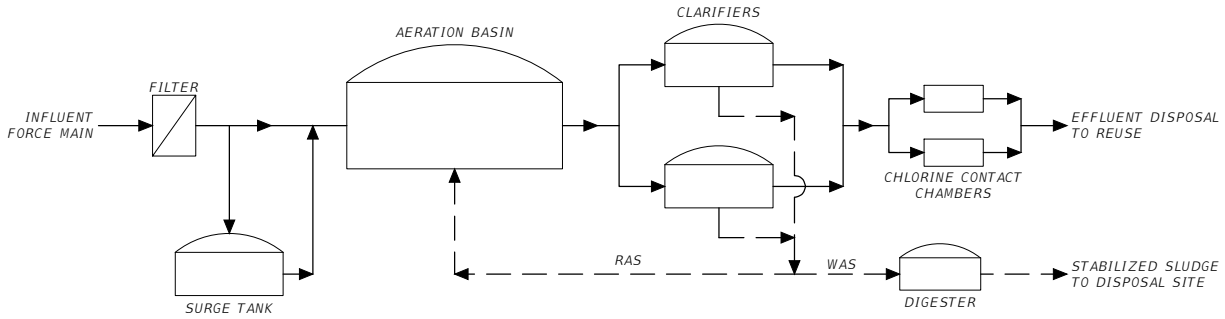
FIGURE 2

OLDER WASTEWATER COLLECTION AREAS WITHIN POLK CITY

DATE: NOVEMBER 2024
CIVILSURV PROJECT NO: 354-001000

EXISTING



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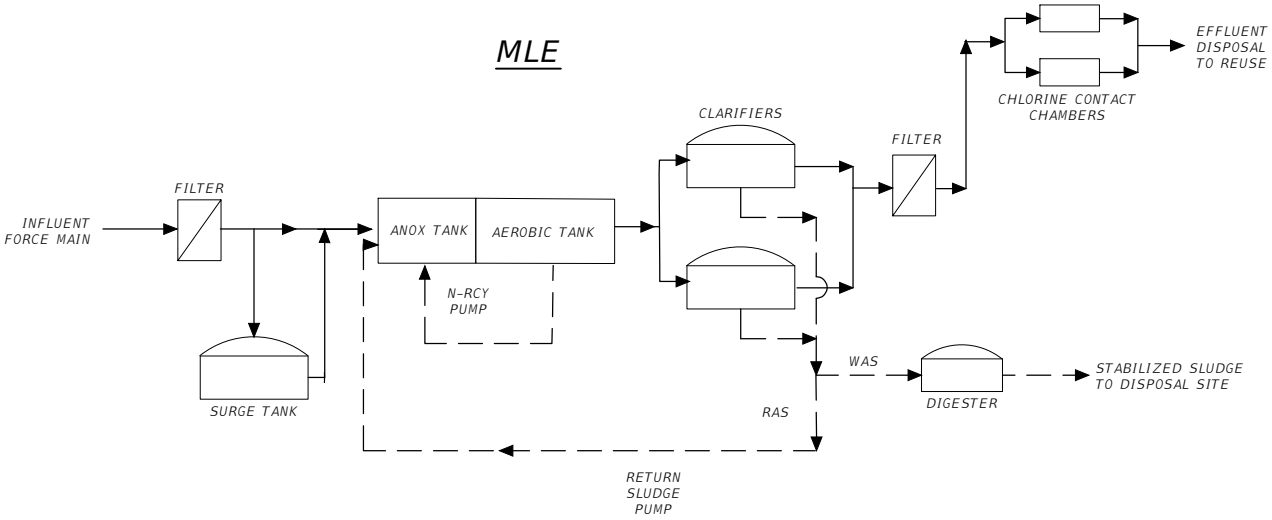

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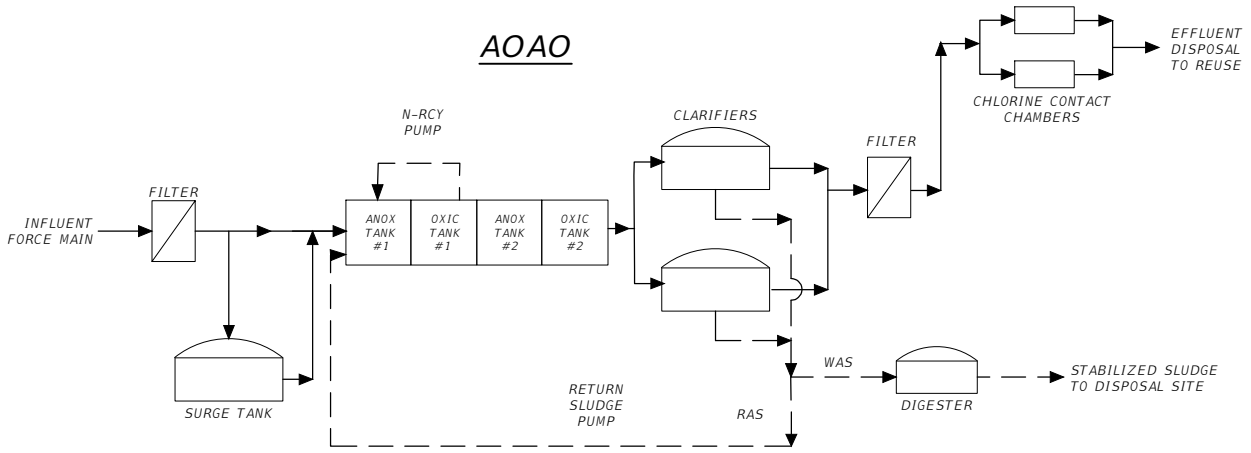
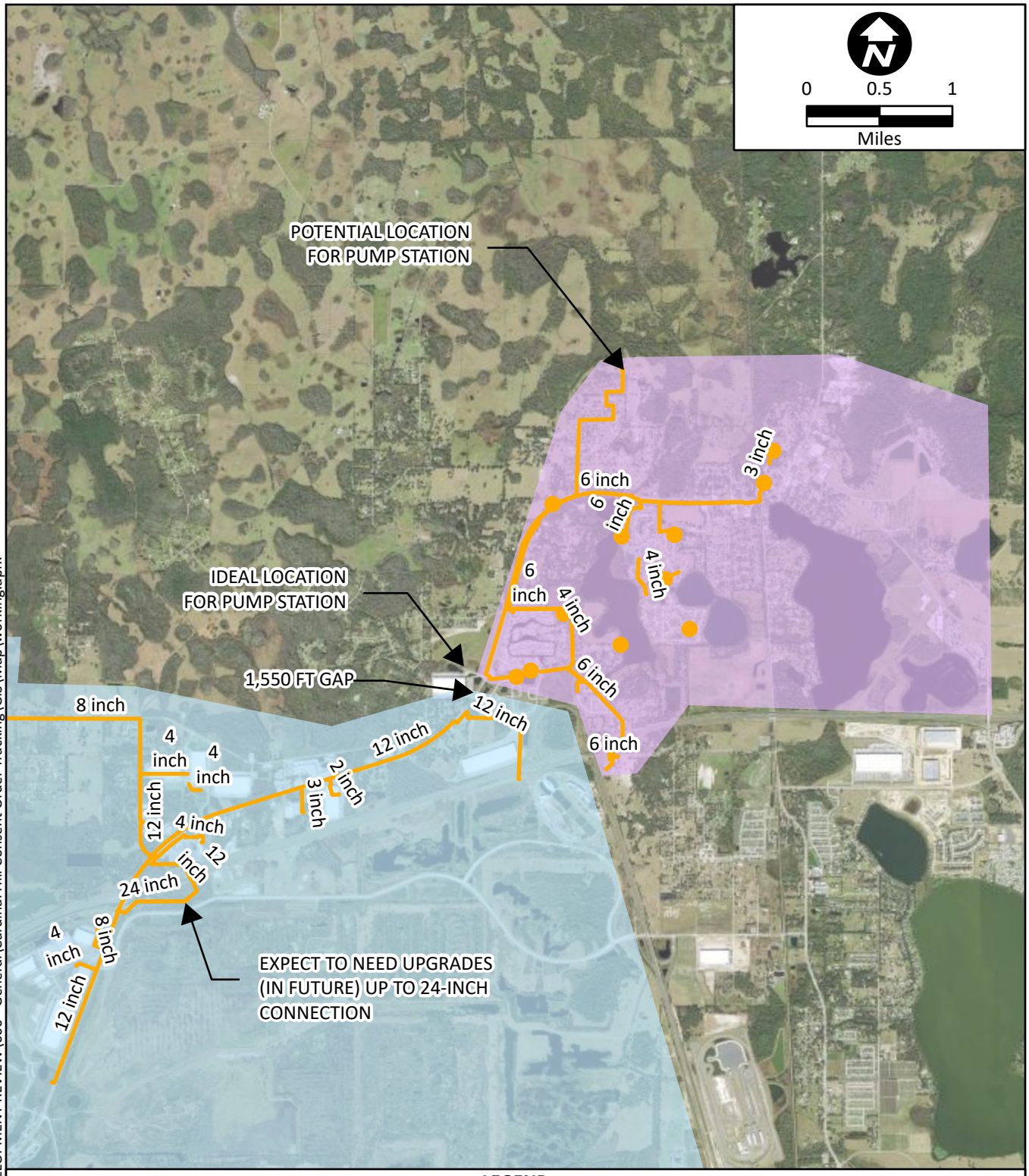


REVISIONS					
		CIVILSURV DESIGN GROUP, INC. 2525 DRANE FIELD ROAD SUITE 7 LAKELAND, FL 33811 PHONE: (863) 646-4771	DESIGNED BY: CRF	POLK CITY - GENERAL SERVICES	SHEET NO.
		CRAIG R. FULLER, P.E. FL. P.E. NO. 65605	DRAWN BY: JA		
			CHECKED BY: MJF	FIGURE 3: PROCESS FLOW DIAGRAM	
		DATE	DATE: NOVEMBER 2024	CSDG PROJECT NO.: 354003003	



LEGEND

- Lift Stations
- Sanitary ForceMain
- Polk City System
- City of Lakeland System

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FIGURE 4

POLK CITY / CITY OF LAKELAND POTENTIAL CONNECTION

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