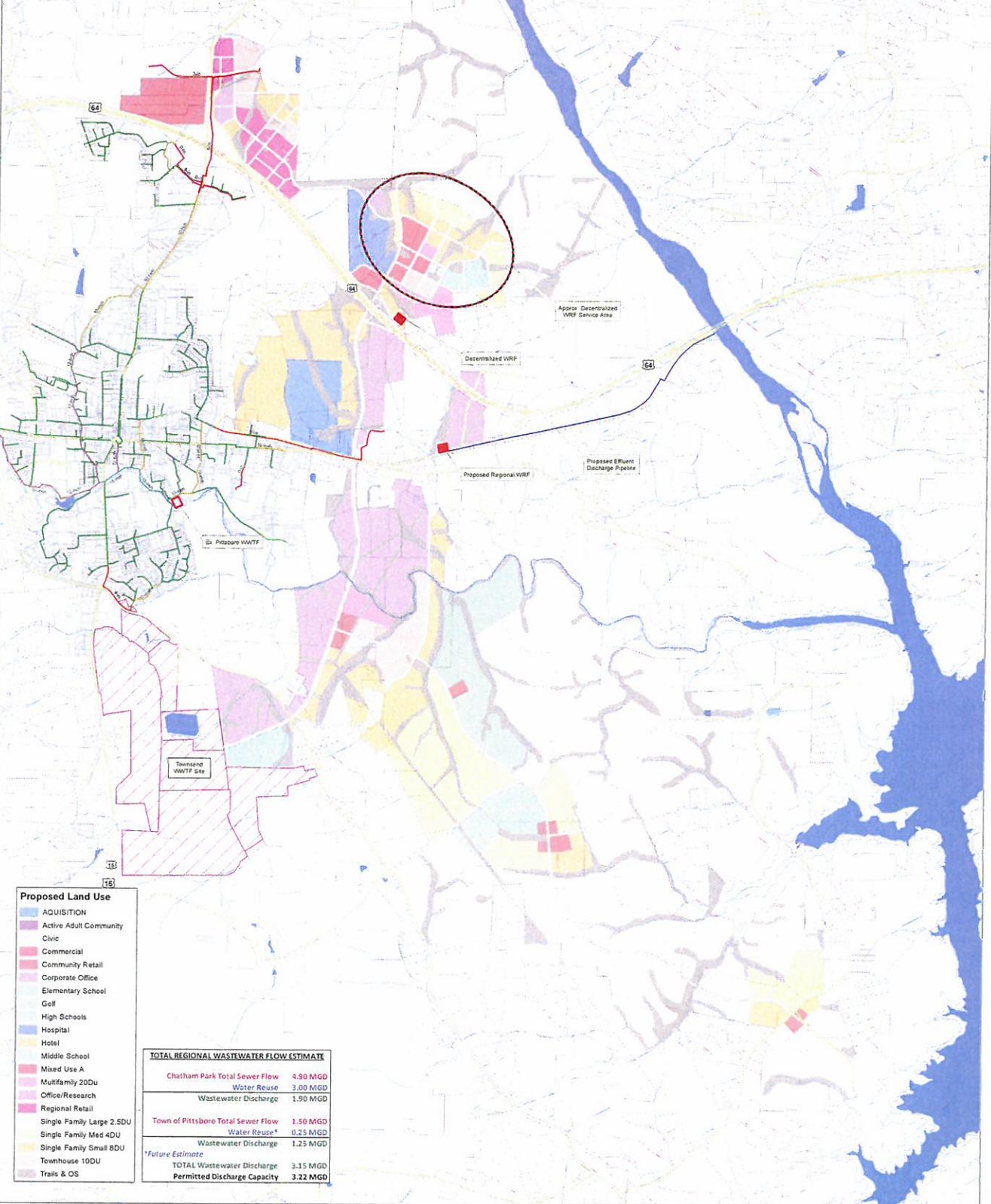
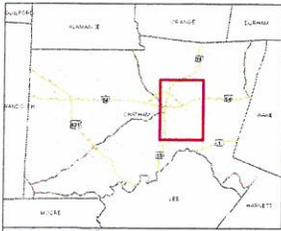


APPENDIX E

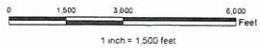
Initial Alternatives Information

Chatham Park Wastewater Service
Plans (Initial)



- Proposed Land Use**
- AQUISITION
 - Active Adult Community
 - Civic
 - Commercial
 - Community Retail
 - Corporate Office
 - Elementary School
 - Golf
 - High Schools
 - Hospital
 - Hotel
 - Middle School
 - Mixed Use A
 - Multifamily 20DU
 - Office/Research
 - Regional Retail
 - Single Family Large 2.SDU
 - Single Family Med 4DU
 - Single Family Small 8DU
 - Townhouse 10DU
 - Trails & OS

TOTAL REGIONAL WASTEWATER FLOW ESTIMATE	
Chatham Park Total Sewer Flow	4.90 MGD
Water Reuse	3.00 MGD
Wastewater Discharge	1.90 MGD
Town of Pittsboro Total Sewer Flow	1.50 MGD
Water Reuse*	0.25 MGD
Wastewater Discharge	1.25 MGD
<i>*Future Estimate</i>	
TOTAL Wastewater Discharge	3.15 MGD
Permitted Discharge Capacity	3.32 MGD



Chatham Park for Preston Development
Chatham County, NC





TECHNICAL MEMORANDUM

TO: Tim Smith – Preston Development Company
Karl Blackley – Preston Development Company

FROM: *Tim Baldwin, PE – Technical Specialist, McKim & Creed*
Ben R. Latino, Jr., PE – Project Manager, McKim & Creed
Brian T. White, PE – Project Engineer, McKim & Creed

SUBJECT: *Chatham Park Initial Infrastructure Implementation*
Water / Sanitary Sewer / Reclaimed Water

M&C PROJECT #: 01561-0005

DATE: February 16, 2015

Purpose

The purpose of this memorandum is to provide a summary of the proposed water and wastewater infrastructure implementation plan, in terms of funding, ownership, and operation.

Water System

Chatham Park plans to obtain all its potable water from the Town's public water supply system. As such, these improvements will follow a traditional model of developer funded infrastructure, dedicated to the municipal owner/operator, and with reimbursement strategies utilizing forgiveness or credits of impact and connection fees for new users/construction within the development.

The initial improvements will include connection to the existing transmission main on US 15/501, and a 500,000 gallon elevated storage tank with overflow elevation and new pressure zone at elevation 710, located within the Chatham Park development near the Village Center. If the Town retains its current standpipe and 679 pressure zone, this system will require an inline booster station to supply it. Alternatively, should the Town wish, this tank could service a new pressure zone replacing the existing standpipe and boosting pressure from the existing 679 zone. This option may require upgrade of the pumps at the water treatment plant to accommodate both the increased demand and increased pressures, but provides benefits to other Town customers and a more reliable system with fewer maintenance requirements. When demands warrant, this new tank will be repurposed as a reclaimed water storage tank, and a new

elevated potable water tank at an elevation of up to 740 will be constructed, in the vicinity of the existing standpipe or on high ground near Firetower Road. This tank again will be sized and connected to service both Chatham Park and the high ground areas of the Town's service area.

In all cases, the new higher pressure zones can be connected via pressure reducing valve stations to the lower pressure zones to provide additional reliability and augment pressures when needed.

Sanitary Sewer System

Chatham Park's preference for implementation of the wastewater and reclaimed water systems would be to incorporate third-party funding and ownership/operation.

Chatham park plans to complete the design and permitting of the major subject facilities – the two treatment plants – and solicit proposals from qualified third-party owner/operators to finance, build, and operate those facilities. The Town would continue to be the retail provider to the individual customers, and the Town would be the single/sole 'customer' of the third-party, who would charge a fee for service for the provision of wastewater treatment and reclaimed water production.

Collection and distribution facilities would be built using the traditional developer/Town funding model described for the water system.

Alternatively, some third-parties (those already set up as regulated utilities) could be interested in assuming a more comprehensive role, assuming the responsibility of being the retail purveyor for the water and/or wastewater and reclaimed water systems. As such, the Town would have no responsibility for service or support of those systems, apart from being a wholesale supplier/seller of potable water. Possibilities exist and could be explored for mutual collaboration or participation in each other's plants/systems to take advantage of available capacities or economies if/as they present themselves over the ensuing development period.

Should third-party solicitations prove unattractive, the traditional developer/Town model first described for the water system could also be adopted for the wastewater systems.

Functionally, service is planned to be provided differently based on the geographic service area and timing of needs.

The area in the northwest region of the development, generally along and adjacent to US 15/501, is planned to be conveyed to the Town's existing treatment plant – to the extent that both collection system and plant capacity exists or can be provided. At whatever point that capacity is unavailable, the flow from that area can be shunted eastward to the Village Center area of the development.

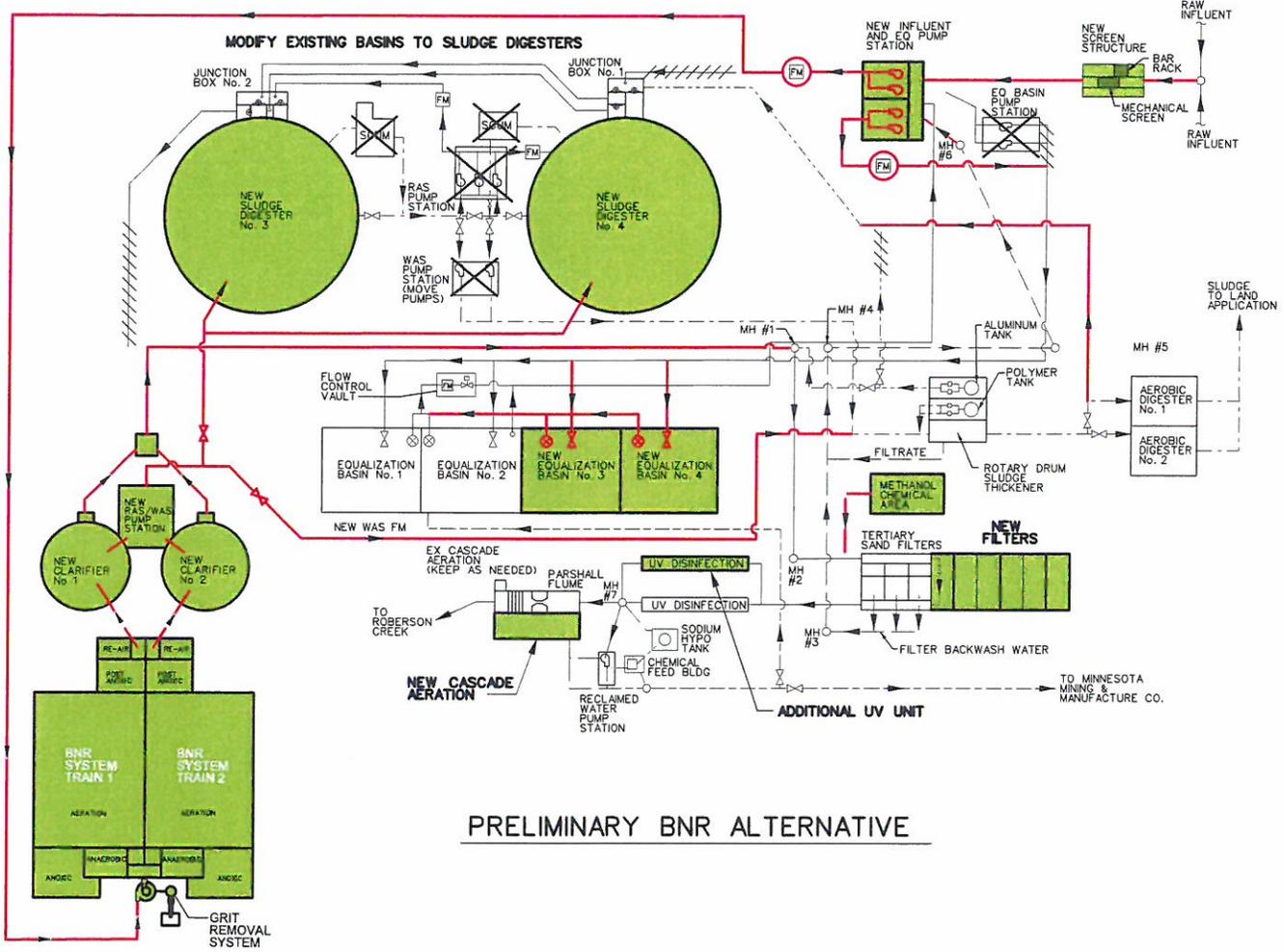
In the village Center, it is planned to construct a small non-discharge satellite reclaimed water treatment system with an initial capacity of 100,000 GPD, expandable to 200,000 GPD. This plant is planned to incorporate a highly sustainable adaptive ecosystem technology able to generate very high quality water with greatly reduced physical and resource footprints compared to conventional treatment methods.

A second larger facility is planned to be located in the area between US 64 Bypass and Business 64, utilizing somewhat more conventional technology, but able to accommodate the widely varying flows associated with a new startup. This facility would be sized initially at 500,000 GPD, and be able to be expanded to an ultimate capacity of at least 3.5 MGD if necessary. It would be planned to deliver reclaimed water throughout the development, and also utilize a portion of the Town's discharge permit and be connected to a new effluent outfall to the previously-approved discharge point in the Haw River in the vicinity of the US 64 crossing.

Beyond the initial phases, expansion of the new treatment plants will be dependent upon the viability of other regional options which may include collaboration with the Town and/or the City of Sanford. There are also possibilities for collaboration with the Town on utilization of the land and/or facilities at the former Townsend Poultry facility.

Initial Wastewater Treatment Alternatives Evaluation

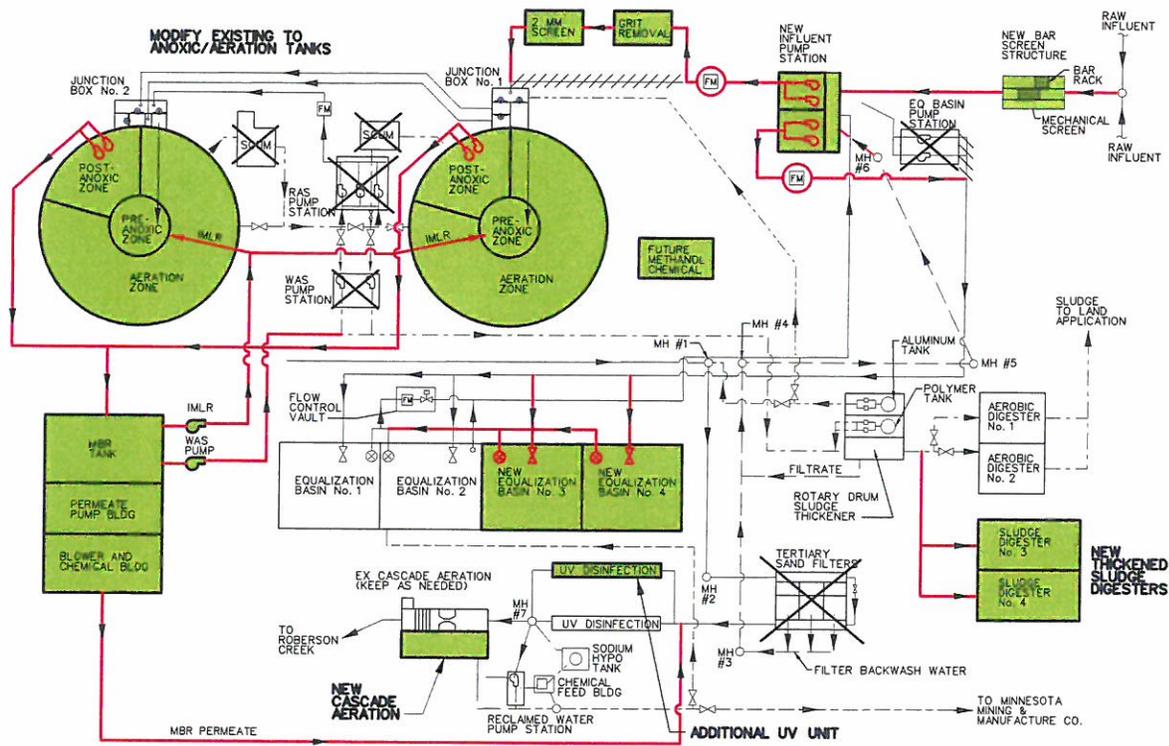
Town of Pittsboro Needs Only



PRELIMINARY BNR ALTERNATIVE

PITTSBORO WWTP CONVENTIONAL BNR





PRELIMINARY MBR ALTERNATIVE

PITTSBORO WWTP CONVENTIONAL BNR



PITTSBORO WWTP IFAS SYSTEM

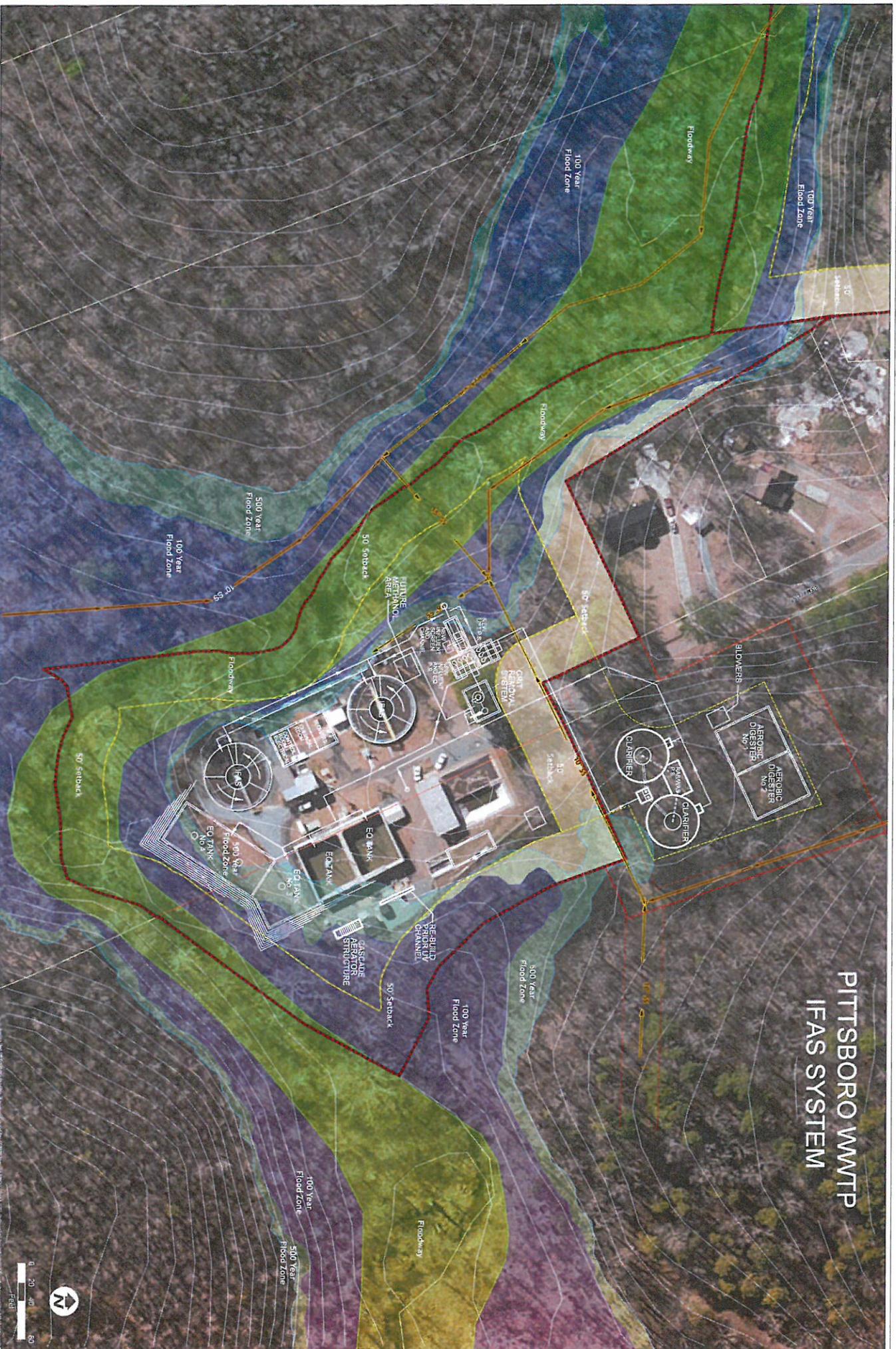


Table E.1: Town of Pittsboro and ETJ Area (No Chatham Park Flow) Preliminary Cost Table

Option	Initial Capital Cost Estimate ¹	Phase 2 Capital Cost Estimate	O&M Annual Estimate		Total Present Worth ²	Initial Construction \$/GAL ³	O&M \$/1,000 GAL	
			Year 1	Year 20			Year 1 ⁴	Year 20 ⁵
Option 1: Phased Expansion Phase 1 – 1.25 MGD Phase 2 – 0.75 MGD	\$ 15,890,000	\$ 8,880,000	\$ 944,000	\$ 1,221,000	\$ 37,214,000	\$ 12.71	\$ 3.45	\$ 1.67
Option 2: Pump to Sanford (2.0 MGD)	\$ 18,550,000	\$ 0	\$ 1,341,000	\$ 1,384,000	\$ 35,633,000	\$ 9.28	\$ 4.90	\$ 1.90
Option 3: Build 2.0 MGD Plant	\$ 21,520,000	\$ 5,660,000	\$ 857,000	\$ 1,289,000	\$ 36,740,000	\$ 10.76	\$ 3.13	\$ 1.77

Notes:

- ¹ - Capital Costs are representative of initial construction and would be proposed SRF loan amount.
- ² - Total Present Worth indicates the current worth of each respective alternative's total project cost in 2015 dollars, including future construction and O&M.
- ³ - Value equals Initial Capital Cost divided by capacity provided = 1.25 MGD for Option 1, and 2.0 MGD for Options 2 and 3.
- ⁴ - Year 1 O&M divided by 0.75 MGD. Current WWTP O&M cost is \$3.29 per 1,000 gallons.
- ⁵ - Year 20 O&M divided by 2.0 MGD

Town of Pittsboro WW Flows (No Chatham Park)

