

CITY OF TRAVELERS REST PLANNING & ZONING DEPARTMENT PLANNING COMMISSION

AGENDA ITEM

January 25, 2024

CASE NUMBER: TR 24-02 (RZ)

SUBJECT: Zoning Map Amendment Request

TO: Travelers Rest Planning Commission

FROM: Michael Forman, AICP – Planning Director

APPLICANT: Deep River South Development, LLC

LOCATION: 129 and 132 East Bowers Road

TAX MAP

NUMBER: p/o 0503030103000 and 0503030103100

REQUEST: Zoning Map Amendment from unzoned to FRD (Flexible Review District)

BACKGROUND: The applicant requests approval to amend the zoning map for two parcels totaling

49.63 acres total, located at 129 and 132 East Bowers Road to FRD (Flexible Review District). The property will be utilized for 87 senior adult single-family home sites, with seven homes utilizing Coleman Road for access and 80 homes utilizing East Bowers

Road, to be developed in phases.

As part of the FRD request, the applicant provided a preliminary development plan, a natural resources inventory, a statement of intent, and a traffic impact study. The

information is included in the packets provided with this agenda item.

FUTURE

LAND USE: The subject parcels are located outside the city limits in unincorporated Greenville

County. The 2019 Greenville County Comprehensive Plan's Future Land Use Map has the subject parcels designated as "Suburban Edge", which is a low-density

single-family classification.

ZONING: The subject parcels are located outside the city limits in unincorporated Greenville

County and are unzoned.

The intent of the city's FRD zoning district is to provide a way for inventive design to be accomplished and to permit development that cannot be achieved through conventional zoning districts due to the parameters required therein.

As per the City of Travelers Rest Zoning Ordinance Section 5:15, FRD zoning applications require inclusion of a preliminary site plan, a natural resources inventory, and a statement of intent with submittal. The applicant has provided the information as required.

EXISTING USES:

ADJACENT PROPERTIES	Zoning Designation	Current Use
Subject Site	Unzoned	Vacant
to the North	Unzoned	Single Family Residential
to the South	Unzoned	Single Family Residential
to the East	Unzoned	Single Family Residential
to the West	R-10 Residential	Single Family Residential

ROADS:

Coleman Road is a two-lane city maintained road. East Bowers Road is a two-lane county maintained road.

A traffic impact study (TIS) was conducted by the applicant in late 2023. Based on the results of the TIS, auxiliary turn lanes are not warranted, and no changes are recommended at the intersections affected by the proposed development.

FLOOD:

There is a 100-year flood zone (Zone AE) located predominantly along the southern and eastern borders of the subject parcels according to 2019 Flood Insurance Rate Maps.

UTILITIES:

Final approval from MetroConnects (sewer) and Greenville Water must be obtained to serve the properties.

ENVIRO:

The project area is made up of forested uplands, managed fields, four non wetlands waters (tributaries), and two forested wetlands. A wetlands delineation study was conducted on-site in late 2023. A total of 10.99 acres and 3,074.4 LF of waters in the forms of four non-wetlands waters tributaries and two forested wetlands were identified within the project area.

A protected species habitat assessment was conducted by the applicant in late 2023. A population of over 100 individual bunched arrowhead were observed and documented on site at the northwestern portion of the subject parcels. The project design plan avoids all impacts to aquatic resources, the area that contains the bunched arrowhead population, and the hillslope above the seepage wetland.

REVIEW

CRITERIA:

The Travelers Rest Zoning Ordinance does not contain any specified criteria that must be considered by the Planning Commission when reviewing requests for rezoning. However, the following criteria are typical of review criteria used by other jurisdictions.

- **A.** Consistency with the Comprehensive Plan or if conditions have changed since the Comprehensive Plan was adopted, consistency with the overall intent of the Plan, recent development trends, and the general character of the area.
- **B.** Suitability of the site's physical or environmental features to support the breadth and intensity of uses that could be developed in the proposed zoning district
- **C.** Compatibility of potential uses permitted in the proposed zoning district with surrounding uses and zoning districts.
- **D.** Capacity of public infrastructure and services to sufficiently accommodate all potential uses allowed in the proposed district without compromising public health, safety, or welfare.

CONCLUSION: Based on the above referenced criteria, staff provides the following findings:

- **A.** Comprehensive Plan consistency: The subject parcels are located outside the city limits in unincorporated Greenville County. The 2019 Greenville County Comprehensive Plan's Future Land Use Map has the subject parcels designated as "Suburban Edge", which is a low-density single-family classification.
- **B.** Site suitability: There is a 100-year flood zone (Zone AE) located predominantly along the southern and eastern borders of the subject parcels according to 2019 Flood Insurance Rate Maps. In addition, a population of over 100 individual bunched arrowhead were observed and documented on site at the northwestern portion of the subject parcels. Bunched arrowhead and bunched arrowhead habitat must not be impacted by the requested project. All appropriate best management practices to avoid negative impacts to wetlands should be adhered to by developers. The applicants are proposing 62% open space (30.93 acres). Of the open space, 17.33 acres will be undisturbed.
- **C. Use compatibility**: The proposed site is adjacent to single family or vacant uses to the north, south, east, and west.
- **D. Site infrastructure capacity**: There appears to be sufficient sewer and water capacity for this request. The requested use does not appear to compromise public health, safety, or welfare.

The proposed text amendment directly addresses two of the City of Travelers Rest 2018 Comprehensive Plan's core challenges: "#4 - Managing Growth", and #6 - "Preserving Older Neighborhoods and Creating New Neighborhoods of Lasting Value" (p. 6). Revising the zoning map in the manner prescribed by this map amendment will directly benefit the City's ability to meet those Recommendations set out in the Land Use Chapter.

A public hearing was advertised in the Greenville News on January 7, 2024. Signage was posted on the site by the applicant's representatives before January 10, 2024.

STAFF REC'D:

Based on its findings, Staff recommends approval of this request to zone the subject properties to FRD Flexible Review District, with conditions.

- 1) Site is subject to all applicable requirements of the City of Travelers Rest Zoning Ordinance as well as all other applicable ordinances.
- 2) All appropriate best management practices must be adhered to during development and construction to avoid negative impacts to wetlands.
- 3) Any potential impact to the identified bunched arrowhead population on-site must be avoided. Impacts (such as tree clearing and grading) to the hillslope above the identified population must be avoided so as not to disturb the hydrology of the piedmont seepage wetland.
- 4) Documented consultation with the U.S. Fish & Wildlife Service and SCDNR must be provided to the Planning Director before proceeding with any construction activities.
- 5) Signage requires a separate permit.

	3) Signage requires a separate permit.
PC REC'D:	
COUNCIL:	

1	h	#	0	98
C	W)	-		, •

\$ 800 Paid 1/



Office Use Only: Application#	Fees Paid PV PV A
Date Received 1-3-24	Accepted ByA

APPLICATION FOR ZONING ORDINANCE MAP AMENDMENT

	The state of the s
Name:	Deep River South Development, LC
Title:	DEVELOPER
Address:	FOR E. Washington St.
City/State/Zip:	Greenville, 5c 29601
Phone:	(216)543-1676
Email:	Scotte deepniversouth.com
	PROPERTY OWNER INFORMATION (If different)
Name:	Clinistopher 1). Bowers

Name: Clinstopher 1). Bowers Title: CAND OWNER Address: 129 E. Bowers Rd. City/State/Zip: Travelers Rest, 5C 29690 Phone: 864-918-1012 Email: CBOWERS+85 A G MAL.CON

PROPERTY INFORMATION

Address:	129 E. Bowers Rd
City/State/Zip:	Trevelers Rest SC 29690
Tax Map #:	P/O 0503 030 103000
Existing Zoning:	Infoned
Requested Zoning:	FRD,
Proposed Use:	Engle-Carrily Residential

Has this property been considered by the City for a Map Amendment before?	No
If "Yes", please provide documentation with this application	

INSTRUCTIONS

- The application and fee, made payable to the City of Travelers Rest, must be submitted no later than 2:00PM on the date specified
 as the Planning Commission monthly application deadline.
- 2. Application fee based on Section 10:1.3 of the City of Travelers Rest Zoning Ordinance.
- 3. Supporting documentation must be provided as necessary at the time of application. The Planning Director shall determine if supporting documentation is sufficient at time of application.
- 4. By signing below I certify that the information contained herein is correct,

*Signature	2000 - TO
Print:	CHRISTOPHON D. Bowers
Sign:	
Date:	1-3-24

Mail or drop off completed application, supporting documents, and payment to:

City of Travelers Rest Planning Department 125 Trailblazer Drive Travelers Rest, SC 29690



Office Use Only:	
Application#	Fees Paid
Date Received	Accepted By

APPLICATION FOR ZONING ORDINANCE MAP AMENDMENT

APPLICANT INFORMATION

Name:	Deep River South Herelyment, LLC
Title:	DEVELOPETZ
Address:	702 E. Waghington St.
City/State/Zip:	Greenville, SC 29601
Phone:	(216)543-1676
Email:	4cotte deep over south com

PROPERTY OWNER INFORMATION (if different)

Name:	Gerald Wayne Bowers
Title:	CAMP DUNETS
Address:	P.O. Box 93
City/State/Zip:	Trievelers Rest, SC 29690
Phone:	864-918-2156
Email:	49-BOWERS. @GMANI.COM

PROPERTY INFORMATION

Address:	132 E. Bowers Rd.
City/State/Zip:	Translers Pest, SC 29690
Tax Map #:	0503030103100
Existing Zoning:	untoned
Requested Zoning	
Proposed Use:	Snigle-family Residential

Has this property been considered by the City for a Map Amendment before?	NO
If "Yes", please provide documentation with this application	

INSTRUCTIONS

- 1. The application and fee, made payable to the City of Travelers Rest, must be submitted no later than 2:00PM on the date specified as the Planning Commission monthly application deadline.
- 2. Application fee based on Section 10:1.3 of the City of Travelers Rest Zoning Ordinance.
- 3. Supporting documentation must be provided as necessary at the time of application. The Planning Director shall determine if supporting documentation is sufficient at time of application.
- 4. By signing below I certify that the information contained herein is correct.

*Signature 1/3/24	Serald W. Bowgs
Print: 1/3/24	SERALD WEBOWERS
Sign:	
Date:	

Mail or drop off completed application, supporting documents, and payment to:

City of Travelers Rest Planning Department

125 Trailblazer Drive Travelers Rest, SC 29690



Order Confirmation

Not an Invoice

Account Number:	948777
Customer Name:	City Of Travelers Rest
Customer Address:	City Of Travelers Rest 125 Trailblazer DR Lori Sondov Travelers Rest SC 29690-2226
Contact Name:	CityOf TravelersRest
Contact Phone:	
Contact Email:	eric@travelersrestsc.com
PO Number:	

Date:	01/04/2024
Order Number:	9709048
Prepayment Amount:	\$ 0.00

Column Count:	1.0000
Line Count:	34.0000
Height in Inches:	0.0000

Print

Product	#Insertions	Start - End	Category
GRE Greenville News	1	01/07/2024 - 01/07/2024	Govt Public Notices
GRE greenvilleonline.com	1	01/07/2024 - 01/07/2024	Govt Public Notices

As an incentive for customers, we provide a discount off the total order cost equal to the 3.99% service fee if you pay with Cash/Check/ACH. Pay by Cash/Check/ACH and save!

Total Cash Order Confirmation Amount Due	\$46.24
Service Fee 3.99%	\$1.84
Cash/Check/ACH Discount	-\$1.84
Payment Amount by Cash/Check/ACH	\$46.24
Payment Amount by Credit Card	\$48.08

Order Confirmation Amount	\$46.24
---------------------------	---------

Ad Preview

PLANNING COMMISSION PUBLIC HEARING

The Travelers Rest City Planning Commission will hold a public hearing on Thursday, January 25, 2024 at 6:00 pm at City Hall. A public hearing will be held for the following proposed items:

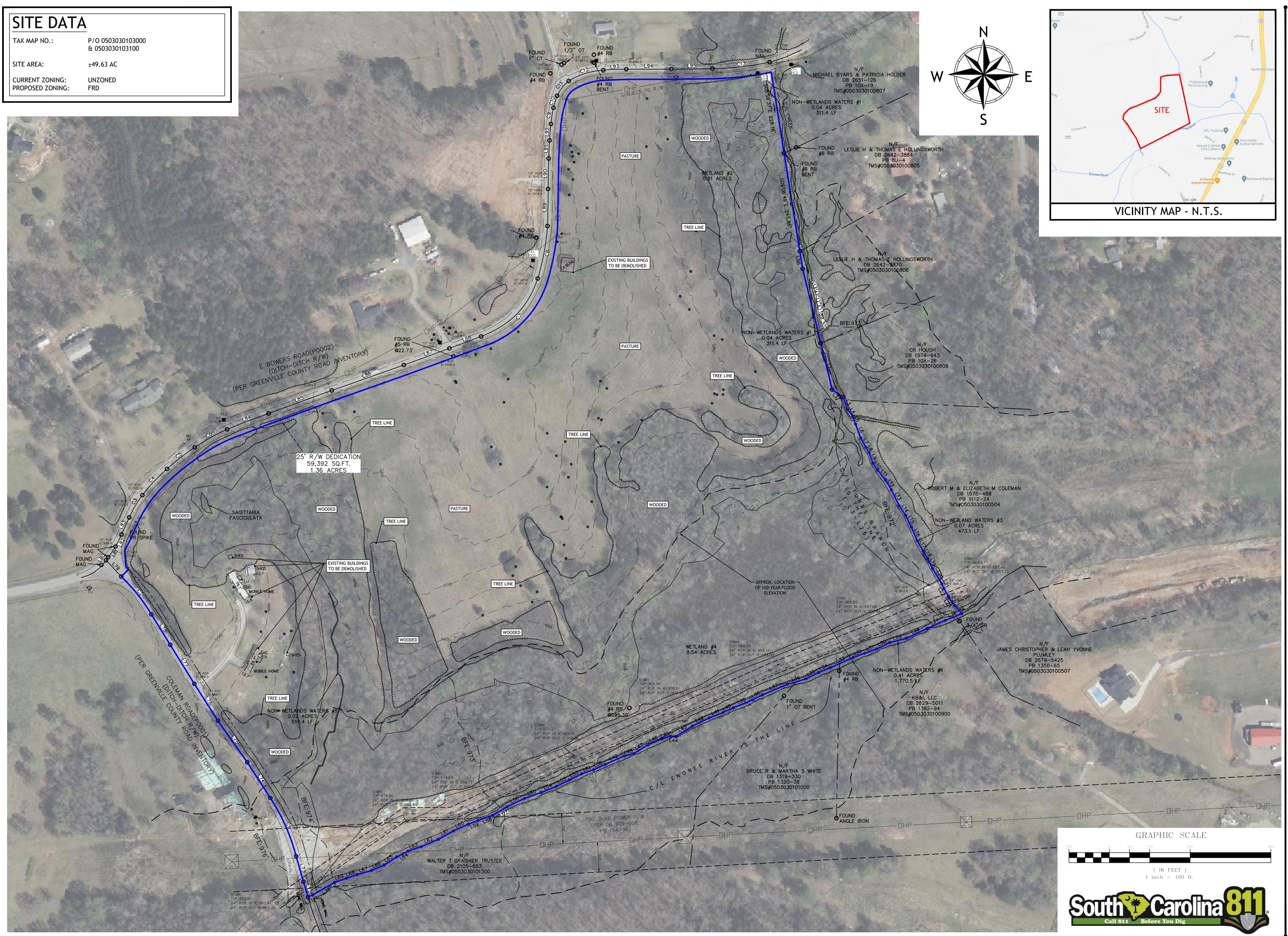
Request Zoning Map Amendment Docket Number TR-24-01 (RZ) Applicant Deep River South Development, LLC Property Location 129 and 132 East Bowers Road Tax Map # p/o 0503030103000 and 0503030103100 **Existing Zoning Unzoned** Requested Zoning FRD (Flexible Review District)

The applications to be considered are available for public inspection in City Hall at 125 Trailblazer Drive and online at https://travelersrestsc.com/b usinesses/departments/planning-zoning/.









DWG Name: The Villas of North Valley PDP-1.dwg

Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

Certificates of Authorization: SC C04212 - GA PEF005865 NC P0868 - AL CA4065E

NORTH VALLEY

0F

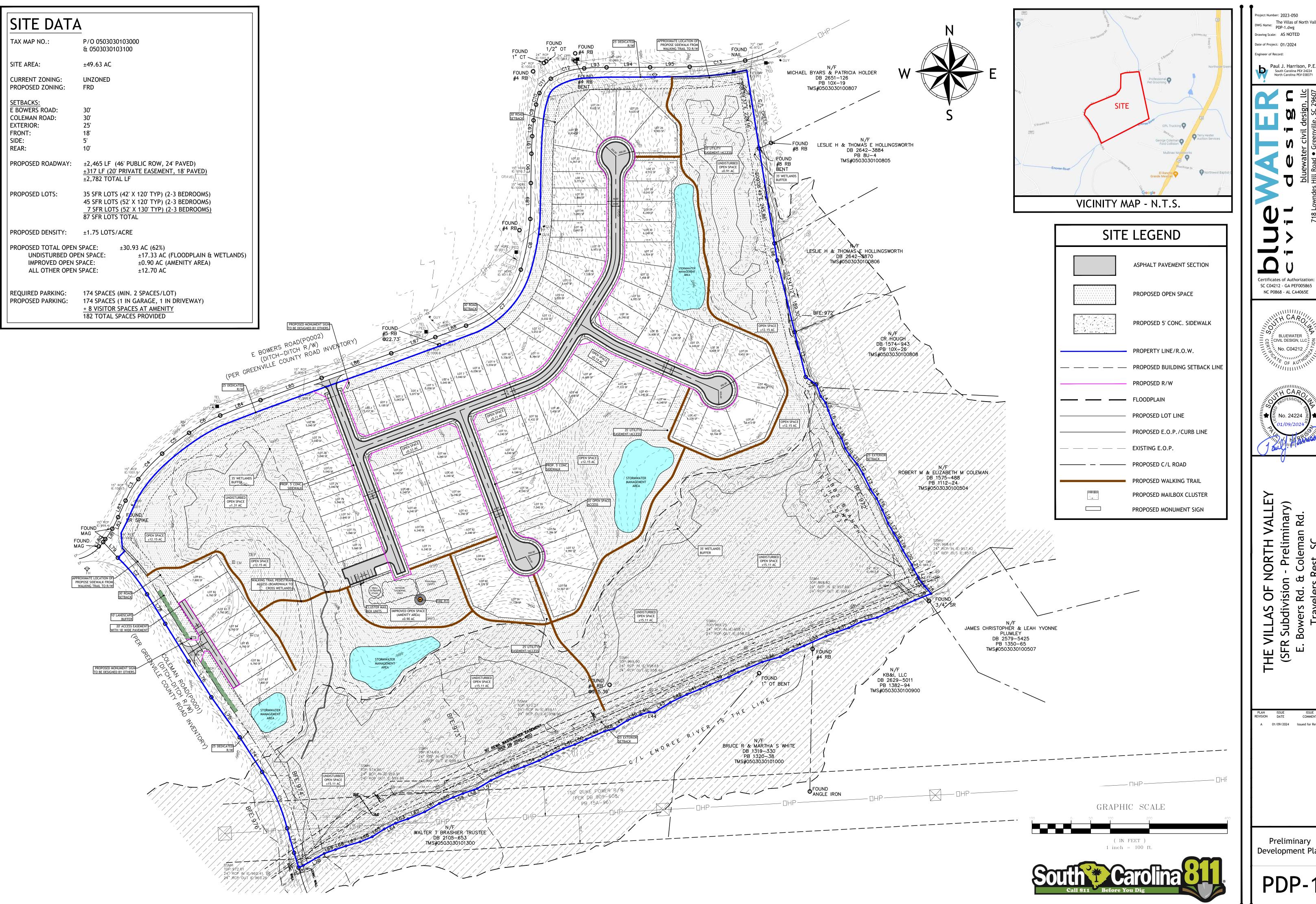
Natural Resources

Inventory

Drawing Scale: as noted

Date of Project: 01/2024

THIS DRAWING AND ASSOCIATED .DWG FILES ARE THE PROPERTY OF BLUEWATER CIVIL DESIGN, LLC AND SHALL NOT BE MODIFIED, USED, OR REPRODUCED IN ANY WAY OTHER THAN AUTHORIZED IN WRITING. © 2024 BLUEWATER CIVIL DESIGN, LLC



The Villas of North Valley DWG Name: PDP-1.dwg Drawing Scale: AS NOTED Date of Project: 01/2024 Engineer of Record: Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

SC C04212 - GA PEF005865 NC P0868 - AL CA4065E BLUEWATER ECIVIL DESIGN, LLC = Z = No. C04212



NORTH 0F

뿚

A 01/09/2024 Issued for Review

Preliminary Development Plan



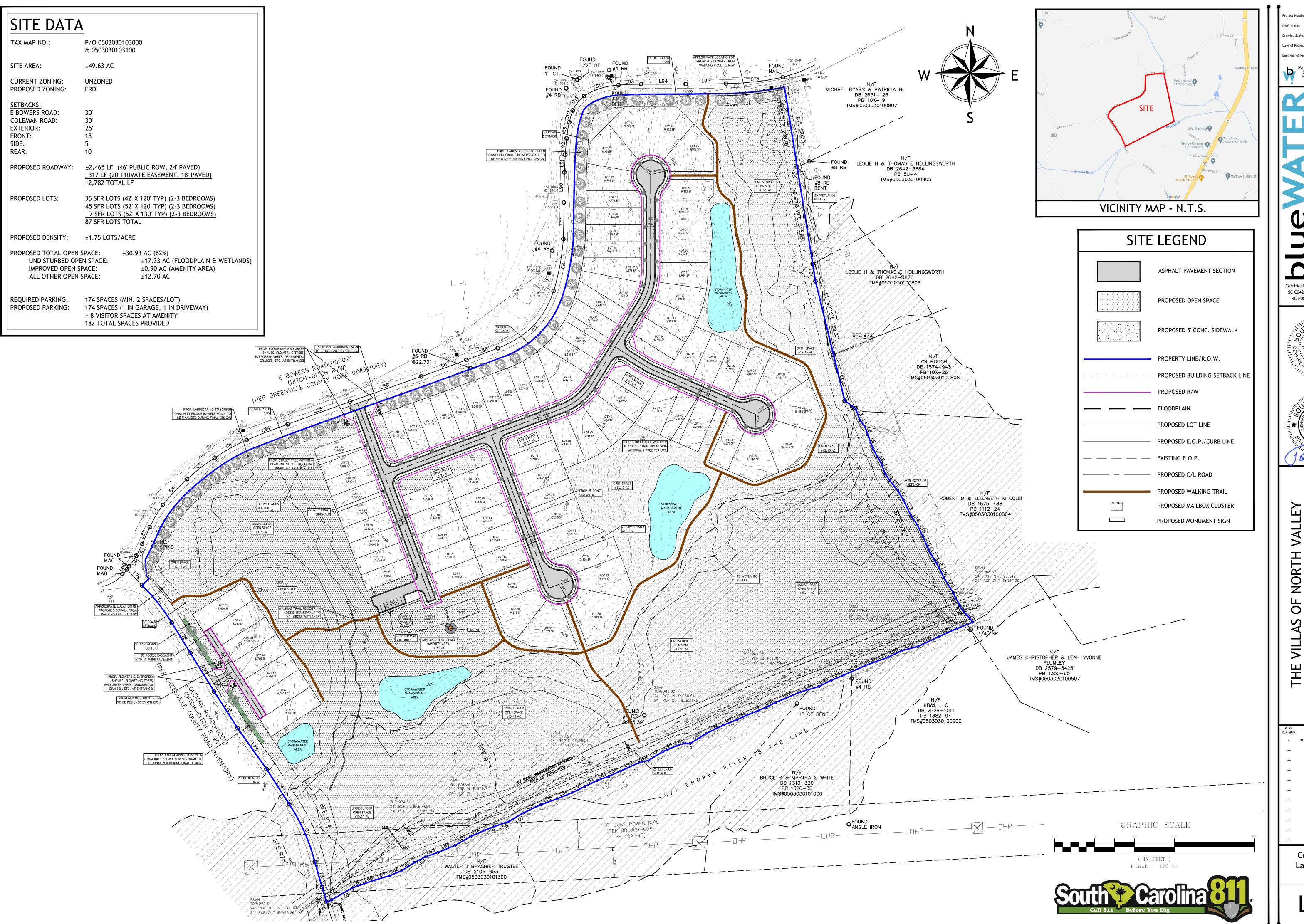
The Villas of North Valley DWG Name: PDP-1.dwg Drawing Scale: as noted Date of Project: 01/2024 Engineer of Record: Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

Certificates of Authorization: SC C04212 - GA PEF005865 NC P0868 - AL CA4065E

BLUEWATER ECIVIL DESIGN, LLC = ₹ = No. C04212

S OF NORTH VALLEY ivision - Preliminary) s Rd. & Coleman Rd. velers Rest, SC Subdivision -Bowers Rd. & (Travelers R

Illustrative Plan



The Villas of North Valley DWG Name: PDP-1.dwg Drawing Scale: as noted Date of Project: 01/2024 Engineer of Record:

Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

Certificates of Authorization: SC C04212 - GA PEF005865 NC P0868 - AL CA4065E

BLUEWATER ECIVIL DESIGN, LLC = Z = No. C04212

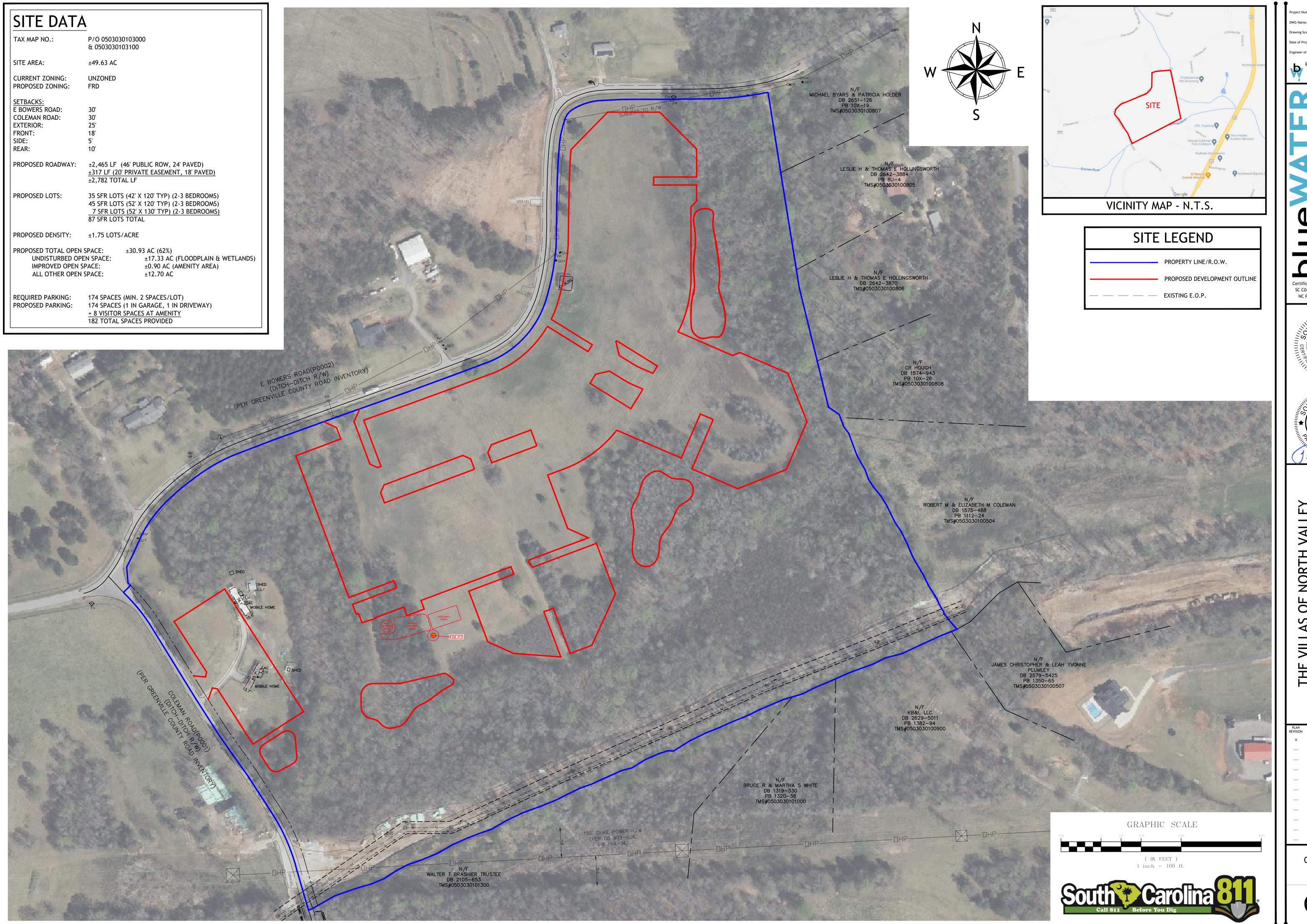


VALLE NORTH Subdivision -0F

Conceptual Landscaping

Plan

THIS DRAWING AND ASSOCIATED .DWG FILES ARE THE PROPERTY OF BLUEWATER CIVIL DESIGN, LLC AND SHALL NOT BE MODIFIED, USED, OR REPRODUCED IN ANY WAY OTHER THAN AUTHORIZED IN WRITING. © 2024 BLUEWATER CIVIL DESIGN, LLC

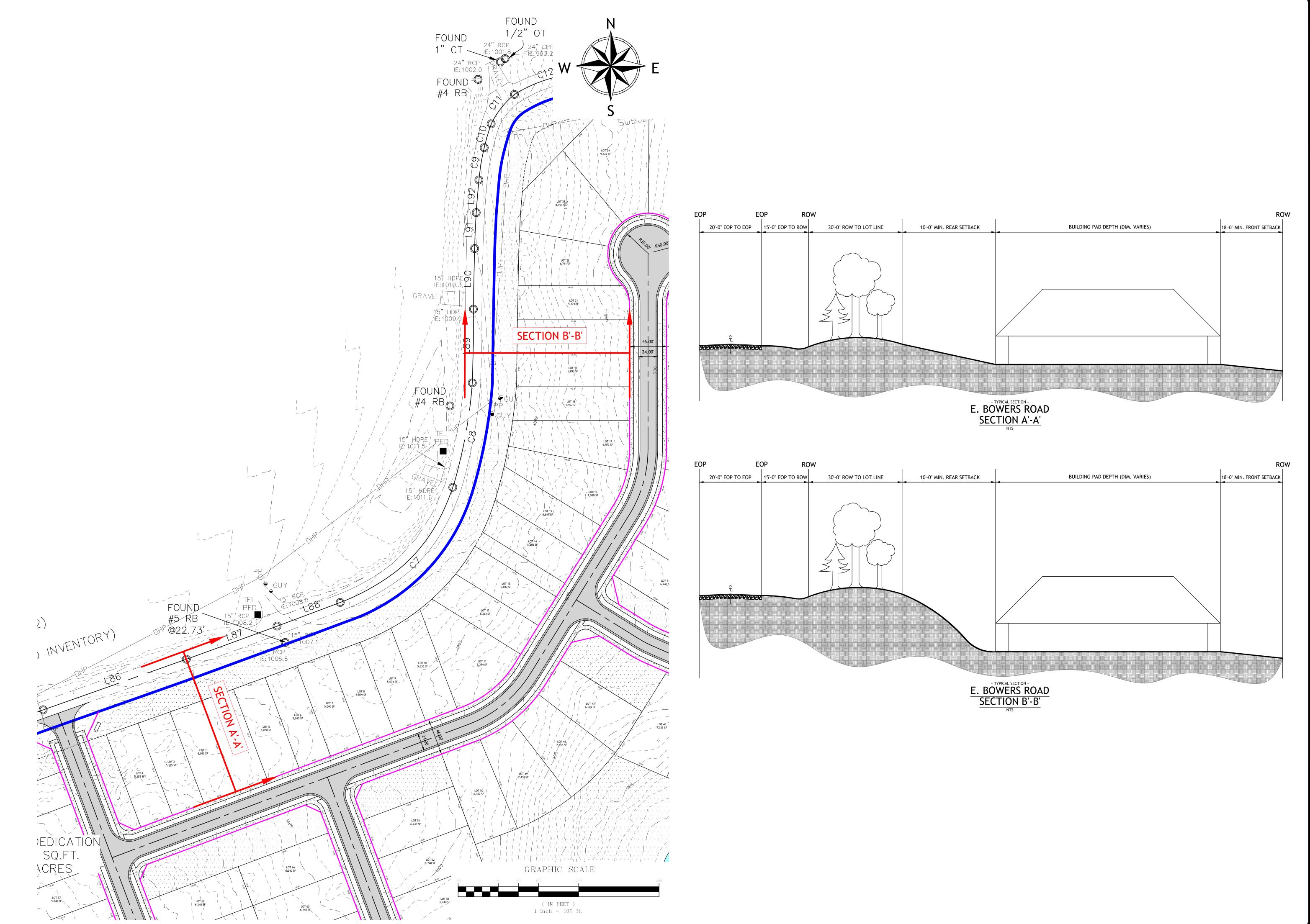


The Villas of North Valley Drawing Scale: as noted Date of Project: 01/2024

Engineer of Record: Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

Certificates of Authorization: SC C04212 - GA PEF005865 NC P0868 - AL CA4065E

Open Space Plan



DWG Name: The Villas of North Valley PDP-1.dwg Drawing Scale: as noted Date of Project: 01/2024

Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

Certificates of Authorization: SC C04212 - GA PEF005865 NC P0868 - AL CA4065E







THE VILLAS OF 13.

THE ENCLAVE OF N

(SFR Subdivision
E. Bowers Rd. & C

PLAN CROSS SECTION VIEW **EXHIBIT**

The Villas of North Valley

"Statement of Intent"

49.63 Acre Single Family Development (Flexible Review District "FRD" Zoning Request) E. Bowers Rd & Coleman Rd – Travelers Rest, SC

Date:

January 3, 2024

Applicant

Deep River South Development, LLC 702 E. Washington Street Greenville, SC 29601 Scott Gillespie (216) 543-1676 scott@deepriversouth.com

Civil Engineer

Bluewater Civil Design, LLC 718 Lowndes Hill Road Greenville, SC 29607 Paul J. Harrison, P.E. (864) 326-4202 paul@bluewatercivil.com

Site Development Plan:



Property Description

This property consists of 49.63 acres located at the intersection of E. Bowers Road and Coleman Road with Greenville County TMS #0503030103100 and P/O #0503030103000. The property is located within Greenville County and currently unzoned. The developer is requesting annexation with a Flexible Review District (FRD) zoning classification.

Community Development Overview

The development planned for this 49.63-acre tract will utilize FRD zoning classification and we are calling the community **The Villas of North Valley.** The development will consist of (1) new access point off E. Bowers Road and (1) new access point off Coleman Road. The roads within the development will be public roads that will be owned and maintained by City of Travelers Rest. A Homeowner's Association (HOA) will be established to maintain common grounds and items outside of the public right-of-way. A (5') wide concrete sidewalk will be provided on both sides of all new roads to allow ease of walkability throughout the development. The separate access & associated lots served by Coleman Road will connect internally to the larger portion of the development with a pedestrian walking path as shown in the development site plan to allow full access to all amenities and the entire community. A boardwalk will be constructed over the small creek area as shown herein. A minimum of four off-street parking spaces per lot will be provided. Additional parking may be provided in off-street parking lot(s) for amenities, guests, and mail centers.

Other infrastructure improvements include public water mains, public sewer mains, storm drainage, and improved open space areas. Open space areas will be a combination of both active and passive open space (disturbed and undisturbed), visitor parking, mail centers, The Amenity Park and a connective walking trail to the community sidewalks and meandering through the extensive undisturbed Green Area space as noted on the site plan. These common areas will be maintained by The Villas of North Valley HOA. The HOA will be responsible for entrance monuments, improved open space areas, landscaping, site lighting, and all other improvements outside of the public right-of-way. Covenants and Restrictions for the Community will be drafted and recorded at the Greenville County Register of Deeds Office with the final plat(s).

The Villas of North Valley HOA

With the filing of the final plat, a complete set of Declarations of Covenants and Restrictions for The Villas of North Valley HOA (the "VNVHOA") will be recorded. These documents will cover all of the normal processes and responsibilities for the new community and will be developed from our operational history of many new subdivisions in the Upstate region. Most importantly, the declarations will identify that the VNVHOA will establish a maintenance program for not only all of the improved open space areas within the community but additionally for all of the individual lot and front lawn gardens of each residence. To keep a high level of consistent quality of all of the grounds of the community, the HOA shall establish a professional lawn mowing and garden maintenance program for all lots. It will not be an option for the residents to "opt out" of this. The cost for this service shall be clearly identified at the point of sale and will be part of the total community fee to be paid by each resident on a quarterly basis. It is from the developer's extensive

experience in establishing many such "managed maintenance" communities in the Midwest and in the Upstate area, the cost for high quality lawn maintenance done on a community wide contract is always a cost value to the residents, meaning they would find that to have all the services for lawn and garden maintenance that the HOA will provide would cost them considerably more over the course of a year if they wanted it done on their lot on an independent basis. So, it will not only offer a significant cost/value advantage, but the managed maintenance of the entire neighborhood will also establish a much nicer and consistently high-quality aesthetic than if lawn care was left up to the homeowner's decision.

Natural Resource Inventory

The existing site is currently mostly undeveloped land consisting mostly of grass pasture and woods. There are two existing mobile home residences with a few small sheds and outbuildings that will be removed. The existing topography slopes evenly and gradually away from the north (E. Bowers Road) toward the south at the Enoree River at a slope of approximately 4.5%. A wetland and protective species study is included with this submission. All wetland areas will be left completely undisturbed. A small area of protective plant species bunch arrowheads has been identified in the northwest corner of the identified wetlands area. This area will remain untouched and undisturbed and no modifications with site development activities will impact the water source that serves the bunch arrowhead area.

The intent of The Villas of North Valley is to maintain any and all environmentally sensitive areas. No negative construction impacts will occur so that those areas will thrive and add to the natural beauty of the site and surrounding area.

There is approximately 2,300 linear feet of property frontage along E. Bowers Road and ±930 linear feet of property frontage on Coleman Road. E. Bowers Road is a two-lane paved road with a paved width of approximately (20) feet and is owned and maintained by Greenville County. Coleman Road is a two-lane paved road that is approximately (20) feet wide and is owned and maintained by Greenville County.

Public water mains adequate to serve our site are available along E. Bowers Road (8" Main) and will serve the Coleman Road lot area with an 8" water main extension from E. Bowers down to the lot area, and all water lines will be owned and maintained by Greenville Water System. Gravity sewer will flow to an existing ReWa gravity trunk main onsite and will be owned and maintained by the City of Travelers Rest Public Works. The proposed community has also been issued service letters from AT&T and Charter for communications, Duke Energy for power, (and if annexed into the city of TR) the City of Travelers Rest for Fire protection. Please refer to Appendix A for will serve letters.

Density & Phasing

The total overall density will not exceed 87 lots/units or roughly (1.75) units per acre. The project will be phased, with a Phase I development being the 7 lot section accessed from Coleman Road and Phase 2 being the primary development area of the community with 80 lots. If the development proceeds as expected, build-out of all residential lots/units is expected within 3-5 years.

Homes & Materials

The primary marketing goal of this new community is to offer a development for the 55+ age group with homes and price points ideal for a FRD community. Prices will start in the community from the high \$300's and range up to the mid \$500's with the expected average price to be around \$475,000. The Villas of North Valley will offer a mix of 42' and 52' wide lots with large areas of open space and outdoor amenities. All homes will have a 2 car garage and 2 private driveway spaces providing a minimum of four parking spaces per home. The minimum square footage per home in the community will be 1,300 SF and maximum of 4,000 SF with most ranging from 1,800 SF - 2,500 SF. All homes will range from 2-3bedrooms, some will have loft spaces and all homes and garages will front directly on proposed interior roads. Exterior building materials will consist of composite siding that will be detailed with cohesive color combinations, detailed with both shake siding and contemporary board and batten trim details and all homes will offer the buyer optional stone and/or brick façade detailing for front elevations. All elevations will be of a quality mix providing a range of colors and elevation accents in a cohesive design format. Roofing material will be dimensional asphalt shingles. Building height will not exceed typical height of a two-story home (avg. 30' in height).

Examples of Building Elevations of Villa Homes







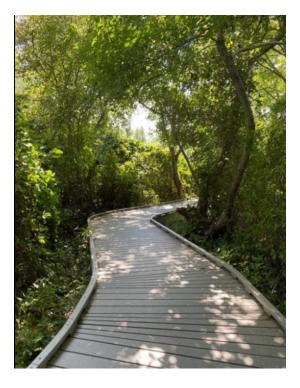


Amenities, Landscaping, & Buffers

The proposed development will include approximately 30.93 acres (62%) of open space area with maximum efforts to preserve existing vegetation/trees around the perimeter property line and in and around the existing tree line. A (25') setback has been established between the development and the surrounding properties. A (30') setback has been established along E. Bowers Road and Coleman Road. These setback areas may be used for screening/buffering. The improved open space areas (±0.9 acres) will consist of disturbed and non-disturbed open space, passive open space, and interconnecting with sidewalks and amenity areas, a community wide walking/jogging trail which shall include a boardwalk connecting the Coleman Road lot section with the Amenity Park. The trail shall also include strategically placed pet waste stations. The Amenity Park as shown on the site plan will contain a community outdoor picnic and gathering area with a firepit, a small outdoor performance stage and a pickleball court.

Examples of Community Walking Path, Boardwalk





Pickleball Court, & Mail Kiosk





Small Outdoor Stage



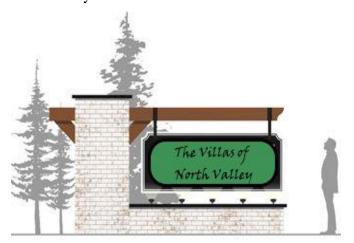
Firepit/Outdoor Patio Area



Entrance Signage/monuments:

Entrance signage will be installed at entrances along E. Bowers Road and Coleman Road. The monument design(s) shall be presented to the City of Travelers Rest Planning & Zoning Staff for approval prior to any installation. The proposed entrance(s) will be irrigated and professionally landscaped with shrubs and annual color. The proposed community gathering areas will be landscaped with perennial canopy trees, evergreen shrubs, and/or evergreen bushes. The landscaping plans will be a part of the permitting plans submitted to the City of Travelers Rest for approval.

Entry Monument on E. Bowers



At Coleman Entry



The stormwater management area(s) may be dry or wet storage depending on water sources once the project progresses to the final design phase. The stormwater management areas may have a fence and/or landscaping around the dike which will comply with current regulations. All improved open space areas, landscaping, monuments, street lighting, stormwater management areas, and mail centers will be maintained by the HOA.

Building Setbacks

All the proposed setbacks for this project are as follows:

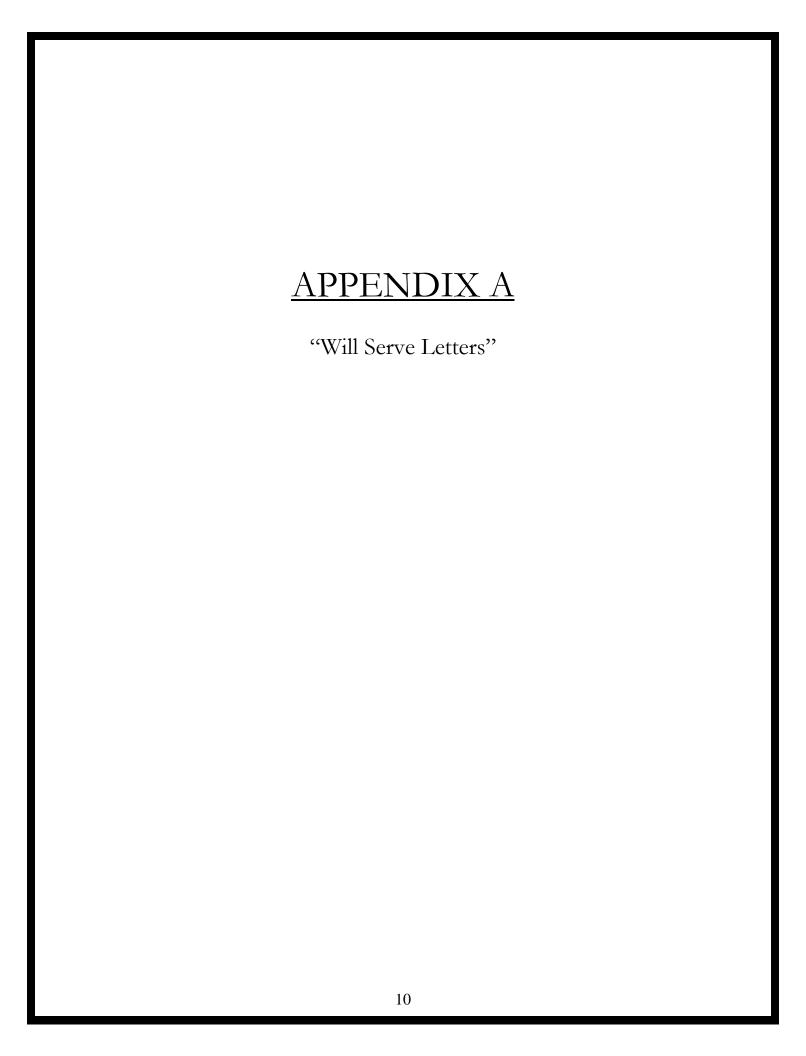
- 25' minimum perimeter setback along exterior property lines. (Setback is measured from the exterior property line.)
- 30' minimum setback along E. Bowers Road
- 30' minimum setback along Coleman Road
- 18' minimum front setback along interior residential roads
- 5' minimum side setback
- 10' minimum rear setback

Site Lighting

It is the Developer's intent to use Duke Energy for all residential site lighting. Streetlights throughout the community will be consistent for all residential areas. Maximum efforts will be implemented to ensure offsite light pollution is minimized.

Example of Typical Street Lamp:







November 20, 2023

Bluewater Civil Design, LLC Attn: Mr. Van Culbertson 718 Lowndes Hill Road Greenville, SC 29607

Via Email: van@bluewatercivil.com

RE: Tax Map # 0503030103000 & 0503030103100 – 129 E Bowers Rd (82 residential units)

Dear Mr. Culbertson:

Greenville Water owns and operates an 8-inch water line along Bowers Road which is available to serve the above properties according to the rules and regulations of Greenville Water.

These properties are currently served by accounts 0079955000, 0100004835, and 0079944000, each with 3/4" taps and 5/8" meters. These existing accounts and taps shall be reused or killed at the developer's expense. Taps to be killed shall have corporation turned off at main and threads destroyed. All killed taps shall be verified by GW inspector.

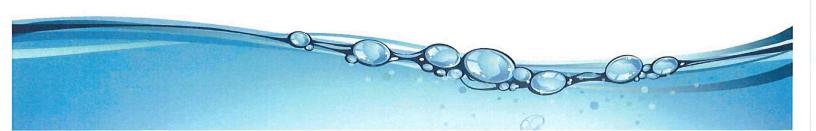
System improvements may be required at the developer's expense. A substantially complete set of plans and estimated total domestic and fire demand should be submitted to Greenville Water for review for final capacity determination.

A map of the water mains in the area has been included for your convenience.

Sincerely, GREENVILLE WATER

Mark Hattendorf
Director of Engineering

MH/as Enclosure







Map Scale: 1:9028 | Map Date: 11/20/2023

Legend

Accounts_Meters

- No Meter Set
- No Account
- Meter Set

Butterfly Valves

- Open Left, CLOSED
- Open Left, Open
- Open Right, CLOSED
- Open Right, Open

- Direction Not Known
- Altitude Valves
- Air Valves
- Blow Off Valves
- ☐ Check Valves☐ Flow Control Valves
- Fireline Valves

 Open Left
- Open Right

Direction Not Known

Hydrant Valves

- Open Left
- Open Right
- Direction Not Known

Gate Valves

- Open Left, CLOSED
- Open Left, Open

- Open Right, CLOSED
- Open Right, Open
- Direction Not Known
- Pressure Reducing Valves
- Hydrant
- Address Point
- Water Main
 - · Private

Public

- Public (PCCP Material)
- Public (Previously Private)
- Private)
 Road Centerline
- Greenville City Limit
 Greenville City
 Annexation Area
- Greenville County
 Boundary
- GW Service Area
 Parcel







November 15, 2023

Van Culbertson Bluewater Civil Design, LLC 718 Lowndes Hill Rd. Greenville, SC 29607

RE: Property located on E. Bowers Rd. at Coleman Rd. Travelers Rest, SC

Dear Mr. Culbertson:

This letter confirms that Duke Energy can provide electric service to the proposed site located on E. Bowers Rd. at Coleman Rd. in Travelers Rest, SC (Greenville County Tax Map #0503030103000 & #0503030103100) provided all necessary easements, permits and rights-of-way can be obtained. Please contact Kim Ball at Duke Energy at (864) 234-4405 when your construction plans are complete so we can discuss your electrical service requirements.

Duke Energy appreciates the opportunity to provide your electric service.

Sincerely,

Kim Ball

Engineering Design Associate

Vin Ball

Mary Paige

From: Greg Robertson < greg@travelersrestsc.com>
Sent: Wednesday, November 15, 2023 11:26 AM

To: Chrissy Drake; Van Culbertson

Cc: Paul Harrison; Mac McMakin; Mike Forman; Eric Vinson

Subject: RE: Fire Service Availability Request

Attachments: E.Bowers Project.jpg

To Whom It May Concern,

The Travelers Rest Fire Department would provide Fire Coverage for the Properties (0503030103000 and 0503030103100) located on E. Bowers Rd if annexed into the City limits.

Gregory W Robertson, Fire Chief Travelers Rest Fire Department 155 Trailblazer Drive Travelers Rest, SC 29690 Bus 864-834-5536 Fax 864-834-2945

From: Chrissy Drake <cdrake@bluewatercivil.com> Sent: Wednesday, November 15, 2023 8:11 AM

To: Greg Robertson <greg@travelersrestsc.com>; Van Culbertson <van@bluewatercivil.com>

Cc: Paul Harrison <paul@bluewatercivil.com> **Subject:** RE: Fire Service Availability Request

That's correct that they currently are within Greenville's jurisdiction, but we are in the process of pulling together a package for annexation of the properties into Travelers Rest so it will be in your territory in the future. We are required to provide "will serve" letters, including from the Fire Department, as part of this package submittal and since we're annexing it's assumed the will serve letters need to come from the jurisdiction after the annexation is complete.

Thanks,

Chrissy L. Drake, PE

Bluewater Civil Design, LLC - Project Manager 5 Century Drive - Suite 230 Greenville, SC 29607

Mailing Address: 718 Lowndes Hill Road Greenville, SC 29607

Cell: 864-320-8968

Email: cdrake@bluewatercivil.com

Please visit our website at: www.bluewatercivil.com

NOTICE: This message is directed to and is for the use of the above-noted addressee only, and its contents may be legally privileged or confidential. If the reader of this message is not the intended recipient, you are hereby notified that any distribution, dissemination, or copy of this message is strictly prohibited. If you have received this message in error, please delete it immediately and notify the sender. This message is not intended to be an electronic signature nor to constitute an agreement of any kind under applicable law unless otherwise expressly indicated hereon.

From: Greg Robertson < greg@travelersrestsc.com > Sent: Wednesday, November 15, 2023 1:12 AM
To: Van Culbertson < van@bluewatercivil.com >

Cc: Chrissy Drake <<u>cdrake@bluewatercivil.com</u>>; Paul Harrison <<u>paul@bluewatercivil.com</u>>

Subject: Re: Fire Service Availability Request

These two properties are located just outside of the City of Travelers Rest jurisdiction, they are in the county's (Greenville) jurisdiction.

Gregory W Robertson, Fire Chief Travelers Rest Fire Department 155 Trailblazer Drive Travelers Rest, SC 29690 864-834-5536

From: Van Culbertson < van@bluewatercivil.com > Sent: Tuesday, November 14, 2023 10:35 AM

To: Greg Robertson < greg@travelersrestsc.com >

Cc: Chrissy Drake < cdrake@bluewatercivil.com; Paul Harrison < paul@bluewatercivil.com>

Subject: Fire Service Availability Request

You don't often get email from van@bluewatercivil.com. Learn why this is important

Greg,

Please see the attached capacity request for a proposed SFR Subdivision off E. Bowers Road and Coleman Road. Please let me know if you have any questions or require any additional information.

Thanks, Van

--

Van Culbertson

Bluewater Civil Design, LLC 5 Century Drive - Suite 230 Greenville, SC 29607

Mailing Address: 718 Lowndes Hill Road Greenville, SC 29607 Cell: 864-684-9403

Office: 864-326-4202 Email: van@bluewatercivil.com
Please visit our website at: www.bluewatercivil.com

NOTICE: This message is directed to and is for the use of the above-noted addressee only, and its contents may be legally privileged or confidential. If the reader of this message is not the intended recipient, you are hereby notified that any distribution, dissemination, or copy of this message is strictly prohibited. If you have received this message in error, please delete it immediately and notify the sender. This message is not intended to be an electronic signature nor to constitute an agreement of any kind under applicable law unless otherwise expressly indicated hereon.

Bluewater Civil Design, LLC has Professionals Licensed in SC, NC, GA, AL, TN, FL, KY, OH, MD, ID, MT, WA, LA, VA

Greenville County, SC



Bowers Christopher D **BOWERS**

Bowers Gerald Wayne **BOWERS**



Disclaimer: This Map is not a LAND SURVEY and is for reference purposes only. Data contained in this map are prepared for the inventory of Real Property found within this jurisdiction, and are compilied from recorded deeds, plats, and other public records. Users of this map are hereby notified aforementioned public primary information sources should be consulted for verification of the information contained in this map. Greenville County assumes no legal responsibility for the information contained in this map.

Map Scale 1 inch = 400 feet11/20/2023



November 14, 2023

Van Culbertson Bluewater Civil Design, LLC 718 Lowndes Hill Rd Greenville, SC 29607

Re: E Bowers Rd, Travelers Rest, (Greenville County)

Mr. Culbertson,

I received your request regarding Charter/Spectrum being able to service the area for the E Bowers Rd Tract in Travelers Rest, Greenville County, SC. This site is well within of our current service area for high speed internet, cable television and home and cell phone services. The purpose of this letter is to confirm that the Property is within an area that Charter may lawfully serve. However, it is not a commitment to provide service to the Property. Prior to any determination as to whether service can or will be provided to the Property, Charter will conduct a survey of the Property and provide an estimate, if needed. Please keep me updated on the progress for this job. Thank you for your time and we look forward to working with you on this and future projects.

If I can be of further assistance to you, please do not hesitate to contact me.

Sincerely,

Shaun Shearer



Shaun Shearer | Business Development Specialist | 864.347.0455

Email: shaun.shearer@charter.com

1511 S. Batesville Rd | Greer, SC 29650

Mary Paige

From: Kimberly Volek < kimberlyv@re-wa.org>
Sent: Tuesday, December 19, 2023 3:44 PM

To: Mary Paige

Cc: Paul Harrison; Van Culbertson; Chrissy Drake
Subject: RE: PSSAR Package Request - E. Bowers Road Tract

Follow Up Flag: Follow up Flag Status: Flagged

I just wanted to let you know that I am still working on this. We are evaluating the capacity in the run of pipe from TR down to our Mauldin Road plant. We need some more time to do some modeling and come up with a plan of action to alleviate any concerns before I can approve the preliminary capacity request.

Thank you



Kimberly Volek

Development Services Coordinator kimberlyv@re-wa.org | rewaonline.org

O: 864-299-4000 x288 C: 864-421-7283 561 Mauldin Road Greenville, SC 29607

ReWa Development Review Fees have recently increased. Please see our current fees here.

From: Mary Paige <mary@bluewatercivil.com>
Sent: Tuesday, November 28, 2023 3:44 PM
To: Kimberly Volek <kimberlyv@re-wa.org>

Cc: Paul Harrison <paul@bluewatercivil.com>; Van Culbertson <van@bluewatercivil.com>; Chrissy Drake

<cdrake@bluewatercivil.com>

Subject: FW: PSSAR Package Request - E. Bowers Road Tract

*** CAUTION! EXTERNAL SENDER *** STOP & THINK! Do you know and trust this sender? Were you expecting this email? Are grammar and spelling correct? Does the content make sense? If suspicious, then do not click links, open attachments or enter your ID or password.

Hi Kim,

Please see the attached Metro signed PSSAR for the E Bowers Road Tract. Please let us know if you have any questions or need anything else in order to provide us with a signed PSSAR. Have a great day!

Thanks, Mary

Mary Paige, E.I.T. Bluewater Civil Design, LLC 5 Century Drive - Suite 230 Greenville, SC 29607

Mailing Address: 718 Lowndes Hill Road Greenville, SC 29607

Cell: 843-330-0188

Email: mary@bluewatercivil.com

Please visit our website at: www.bluewatercivil.com

NOTICE: This message is directed to and is for the use of the above-noted addressee only, and its contents may be legally privileged or confidential. If the reader of this message is not the intended recipient, you are hereby notified that any distribution, dissemination, or copy of this message is strictly prohibited. If you have received this message in error, please delete it immediately and notify the sender. This message is not intended to be an electronic signature nor to constitute an agreement of any kind under applicable law unless otherwise expressly indicated hereon.

Bluewater Civil Design, LLC has Professionals Licensed in SC, NC, GA, AL, TN, FL, KY, OH, MD, ID, MT, WA, LA, VA

From: Martin Bowen < mbowen@metroconnects.org > Sent: Tuesday, November 28, 2023 11:36:25 AM
To: Van Culbertson < van@bluewatercivil.com >

Cc: Toni Lewis <tlewis@metroconnects.org>; Paul Harrison <paul@bluewatercivil.com>; Chrissy Drake

<cdrake@bluewatercivil.com>

Subject: RE: PSSAR Package Request - E. Bowers Road Tract

Van, your capacity request is attached. There are a few items you should be aware of with these parcels and this project.

- The parcels fall within the "Annexation Area" (see attached map), as defined in the Intergovernmental Transfer Agreement agreed to by Metro and Travelers Rest.
 - You will need to abide by Section 9 of the agreement, as shown in the image below.
- Annexation into Travelers Rest and into the Metro service area will be required (in that order) before plan review begins.
 - Travelers Rest is copied on this email for coordination purposes.
- The proposed connection is to a ReWa trunk line that is under construction. ReWa is copied on this email. Acceptance of the new system will not occur until a Permit to Operate (PTO) for the ReWa system is provided to Metro. It would be at the owner's risk to begin construction of the new system prior to ReWa obtaining a PTO for their new system.

Let us know if you have any questions.

Thank you.

Section 9 Extra-Jurisdictional Controls.

- (a) Annexation Requirement. In the event that the owner of property that is wholly or partially located within the Annexation Area the Metropolitan Boundaries for the purpose of obtaining sewer collection service, and such property is adjacent to the City's municipal boundaries, Metropolitan shall not request action by the County Council to enlarge the Metropolitan Boundaries to include such property until such time as (1) the City has annexed such property or (2) the City has determined to waive this requirement (the "Annexation Requirement").
- (b) Procedures. The Parties shall use the following procedures with respect to the Annexation Requirement:
 - (i) At such time as Metropolitan receives a request from the owner of a property that is subject to the Annexation Requirement (a "Subject Property") for annexation into the Metropolitan Boundaries, Metropolitan shall forward such request to the City.
 - (ii) At the next regularly-scheduled meeting of the City Council of the City (the "City Council"), the City Council shall make a preliminary determination as to whether the City wishes to annex the Subject Property or waive the Annexation Requirement with respect to the Subject Property.
 - (iii) Within five (5) days of such determination, the City shall notify Metropolitan and the owner of the Subject Property of its determination in writing. If the City determines to annex the Subject Property, the City shall request an

7

annexation petition from such owner as soon as is practicable, and will diligently pursue proper action by the City Council in accordance with State law to annex the Subject Property.

(iv) At such time as the City has either waived the Annexation Requirement or the City has completed the annexation of the Subject Property, Metropolitan and the City shall request that the County Council take proper action to enlarge the Metropolitan Boundaries to include the Subject Property.

Martin Bowen, PE
Development Projects Manager
120 Augusta Arbor Way / Greenville, SC 29605

p: 864.277.4442 x264 c: 864.894.0009

mbowen@metroconnects.org www.metroconnects.org



MEMORANDUM

DATE: January 2, 2024

TO: City of Travelers Rest

FROM: Thomas O'Neal, PM, Blueline Environmental Consultants, LLC

SUBJECT: E Bowers Road Project and Bunched Arrowhead

I am writing this to address the possible concerns that the proposed actions on the E Bowers Road site may impact extant bunched arrowhead (Sagittaria fasciculata) populations.

Blueline Environmental Consultants, LLC completed an endangered species habitat assessment and wetland delineation on the E Bowers Road property in Travelers Rest, South Carolina on September 1, 2023. A population of bunched arrowhead (*Sagittaria fasciculata*) was located in the northwestern corner of the project area.

After reviewing the proposed site plan provided by Bluewater Civil Design, the actions on site will avoid direct impacts to the population of bunched arrowhead as well as any impacts to the wetland and hillslope above said population. There is a proposed boardwalk that is to be constructed downslope of the population, but this will have no effect on bunched arrowhead or the hydrology of the seepage wetland.

Please contact me at thomas.oneal@bluelineenviro.com with any questions.

PROTECTED SPECIES HABITAT ASSESSMENT E BOWERS RD GREENVILLE COUNTY, SOUTH CAROLINA BLUELINE PROJECT NO. 2197

PREPARED FOR: Deep River South Development

PREPARED BY:

BLUELINE ENVIRONMENTAL CONSULTANTS, LLC 710 LOWNDES HILL ROAD GREENVILLE, SOUTH CAROLINA 29607

December 2023

Bunched arrowhead was documented on site by SCDNR in 1994. A population of over 100 individuals of bunched arrowhead were observed on site in the northwestern portion of the piedmont seepage forest. The geographic limits of this population were surveyed and can be observed in the reference figures included within this report. Any impact to the identified population should be avoided. Impacts (such as tree clearing and grading) to the hillslope above the population should be avoided as not to disturb the hydrology of the piedmont seepage wetland.

TABLE OF CONTENTS

1.0	INTRODUCTION	•	•	•	•	1
2.0	PROJECT DESCRIPTION		•			1
3.0						
4.0	PROTECTED SPECIES IN QUESTION 4.1 AGENCY REVIEW 4.3 PROTECTED FAUNA . 4.4 PROTECTED FLORA .	•			•	3 4
5.0	CONCLUSIONS					10
6.0	REFERENCES	•				12
7.0	APPENDICES 1 REFERENCE FIGURES . 2 CURRENT DESIGN PLAN . 3 REPRESENTATIVE PHOTOGRAM 4 AGENCY RESPONSES	PHS				

1.0 INTRODUCTION

Austin Evert, of Deep River South Development, in Greenville, South Carolina, retained Blueline Environmental Consultants, LLC (Blueline) to provide an endangered species habitat assessment for the project area referenced as the E Bowers Rd site located in Greenville County, South Carolina. The habitat assessment was performed in September 2023 to determine if habitat for protected species was present on the property.

Endangered and threatened species are protected under the Endangered Species Act (ESA) of 1973 (16 USC 1531-1543). Endangered species are defined as those plants and animals whose prospects of survival are in immediate danger. Threatened species are those species that may become endangered if conditions related to their existence continue to deteriorate (e.g., loss of suitable habitat). A third category of concern includes candidate species. Candidate species are those species that may be listed as endangered or threatened in the future (species of concern). Candidate species are not legally protected under the federal or state ESA. They are provided in this report to account for the possibility that they might become protected in the near future.

Blueline's assessment of potential protected species habitat on the target property was conducted in three (3) phases. The first phase consisted of a review of existing records obtained from federal (US Fish and Wildlife Service) agencies and the South Carolina Department of Natural Resources (SCDNR). Both agencies provided listings of potential protected species for Greenville County. Types of habitat for the protected species were found in various keys and field guides, and on US Fish and Wildlife Service (USFWS) web pages. The second phase involved the qualitative and quantitative assessment of general habitat types on the property, as well as actively looking for the endangered and threatened species described in the USFWS threatened species list for the county in question. The third phase of the assessment consisted of comparing the habitats identified in phase 2 with those protected species requirements identified in phase 1. Thus, a determination of critical habitats and the potential for the existence of protected species was conducted.

2.0 PROJECT DESCRIPTION

The project areas are approximately 50.99+/- acres south of E Bowers Road and East of Coleman Road in Travelers Rest, South Carolina. The project area occupies two Greenville County Tax Parcels: 0503030103100 and a portion of 0503030103000. The approximate project area center is 34.9893487° N, and -82.428569° E. The project areas consist of paved road, residential buildings, managed fields, mid-successional forest, piedmont seepage forest, piedmont small stream forest containing streams and forested wetlands, and a newly constructed sanitary sewer right-of-way (SSROW). This is a residential development project that will involve tree removal, land clearing, grading, and the construction of roads, residential buildings, and utility lines. The current timeline of the projects are unknown. Construction will avoid impacts to aquatic resources and identified critical habitat and populations of threatened species. Protective measures such as the implementation of silt fences will also be used to avoid the infiltration of silt into streams and wetlands. These are not federally funded projects and will be funded by Deep River South Development.

3.0 ENVIRONMENTAL BASELINE

3.1 Habitat Assessment

An assessment of the habitat types of the target property was determined by performing on-site surveys in September 2023. Habitat characteristics were based on vegetation communities, location in the landscape, past anthropological disturbances, and hydrology, referencing The Natural Communities of South Carolina, published by John B. Nelson in 1986 and the "Piedmont Ecoregion Terrestrial Habitats" document, published by the South Carolina Department of Natural Resources in 2005.

3.2 Observed Habitat Types

Six 6) major habitat types were identified in the project areas: paved road, midsuccessional forest, managed fields, piedmont small stream forest, and aquatic resources.

TABLE 1 HABITAT ASSESSMENT SUMMARY TALLEY BRIDGE ROAD AND COLEMAN TRAIL GREENVILLE COUNTY, SOUTH CAROLINA			
Habitat Type	Approximate Acreage		
1. Managed Fields	20.9 acres		
2. Piedmont Seepage Forest	13.3 acres		
3. Mid-Successional Forest	7.3 acres		
4. Piedmont Small Stream Forest	6.7 acres		
5. Sanitary Sewer Right-of-Way (SSROW)	2.7 acres		
6. Aquatic Resources (i.e. streams and wetlands)	<11 acres		
	(Included within piedmont small		
	stream forest and piedmont seepage		
	forest)		
Total:	50.9 +/- acres		

The managed field habitat type is located in the western and northern portions of the project area. The managed fields included residential lawn and hay fields. The dominant strata within this habitat type were herbs and grasses, with grasses such as bahiagrass (*Paspalum notatum*), Johnson grass (*Sorghum halepense*), green foxtail (*Setaria viridis*), red fescue (*Festuca rubra*), little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), and annual vernalgrass (*Anthoxanthum aristatum*) being the most prevalent. Herbaceous species such as poison ivy (*Toxicodendron radicans*), tall goldenrod (*Solidago altissima*), dogfennel (*Eupatorium capillifolium*), and American burnweed (*Erechtites hieracifolia*) were also present.

The piedmont seepage forest habitat type occupies a large portion of the western and southern portions of the project area. A large seepage wetland was observed in this area

with mature hardwood tree species such as tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidmabar styraciflua*), red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), and river birch (*Betula nigra*) being the most prevalent. Shrub species such as Chinese privet (*Ligustrum sinense*), winterberry holly (*Ilex verticillata*), and possumhaw (*Viburnum nudum*) were the most prevalent. The herbaceous species observed in the piedmont seepage forest included laurel greenbrier (*Smilax laurifolia*), cardinal flower (*Lobelia cardinalis*), great blue lobelia (*Lobelia siphitica*), netted chain fern (*Woodwardia areolate*), small-spike false nettle (*Boehmeria cylindrica*), white grass (*Leersia virginica*), poison ivy (*Toxicodendron radicans*), Japanese stiltgrass (*Microstegium vimineum*), soft rush (*Juncus effusus*), wart-removing herb (*Murdannia keisak*), and bunched arrowhead (*Sagittaria fasciculata*).

The mid-successional forest habitat type bordered was found between the managed field and the piedmont seepage forest habitat types. Some mature trees including water oak (*Quercus nigra*), tulip poplar (*Liriodendron tulipifera*), American sycamore (*Platanus occidentalis*), and sweetgum (*Liquidambar styraciflua*) were present within the habitat type. Herbaceous and grass species such as sawtooth blackberry (*Rubus argutus*), wrinkleleaf goldenrod (*Solidago rugosa*), Japanese stiltgrass (*Microstegium vimineum*), common greenbrier (*Smilax rotundifolia*), and poison ivy (*Toxicodendron radicans*) occupied the understory.

The piedmont small stream forest habitat type is found along the eastern project area boundary along a small stream and the southern project area boundary in the floodplain of the Enoree River. Mature tree species such as water oak (*Quercus nigra*), American sycamore (*Platanus occidentalis*), tulip poplar (*Liriodendron tulipifera*), boxelder maple (*Acer negundo*), common persimmon (*Diospyros virginiana*), and sweetgum (*Liquidambar styraciflua*) were observed within this habitat type. Shrub species such as Chinese privet (*Ligusrum sinense*) and multifloral rose (*Rosa multiflora*) were also observed. The prevalent herbaceous species included switch cane sawtooth blackberry (*Rubus argutus*), hairy crabgrass (*Digitaria sanguinalis*), Japanese honeysuckle (*Lonicera japonica*), poison ivy (*Toxicodendron radicans*), Japanese stiltgrass (*Microstegium vimineum*), and wingstem (*Verbesina alternifolia*).

The sanitary sewer right-of-way (SSROW) is located along the southern project area boundary in the floodplain of the Enoree River. This SSROW was recently constructed and was composed of packed gravel and sand. Vegetation was sparce, with species such as Japanese stiltgrass (*Microstegium vimineum*) and soft rush (*Juncus effusus*) being the most prevalent.

The aquatic resources found on site consisted of four tributaries and two forested wetlands, which were located in the piedmont small stream forest and piedmont seepage forest habitat types.

4.0 PROTECTED SPECIES IN QUESTION

4.1 Agency Review

Agency reviews were performed via websites maintained by the federal and state agencies responsible for the protection of threatened and endangered species. Requests for

information regarding the occurrence of protected species on or near the project site were directed to the USFWS Information for Planning and Consultation (IPaC) website and the SC DNR Heritage Trust Database.

Protected species habitat requirements, as determined from literature review and agency databases were compared to those habitat types identified on the property. If protected species habitat requirements corresponded to any of those habitats identified on the property, a qualitative assessment of the potential presence of that species was provided.

4.2 Protected Fauna

Lists of protected animal species for Greenville County were provided by the U.S. Fish and Wildlife Service and by the South Carolina Department of Natural Resources. Listed species, status, and on-site potential are summarized in Table 2. The results of this survey indicate that none of the animal species listed for Greenville County were present on the target property.

TABLE 2 PROTECTED FAUNA SUMMARY GREENVILLE COUNTY, SOUTH CAROLINA					
Common Name	Scientific Name	Status	On-Site Potential	Potential Impact	
Bog Turtle	Glyptemys muhlenbergii	SAT	None	No Effect	
Tricolored Bat	Perimyotis subflavus	CS	Low	MANLAA	

 $FE = Federal\ Endangered,\ FT = Federal\ Threatened,\ SE = State\ Endangered,\ ST = State\ Threatened,\ CS = Candidate\ Species\ SAT = Similarity\ of\ Appearance,\ Threatened$

MANLAA= May Affect, Not Likely to Adversely Affect, MALAA=May Affect, Likely to Adversely Affect

A habitat assessment was performed for each protected animal species listed in Table 2. Species requirements were compared to those habitats observed. A summary of habitat requirements and on-site potential for each species is provided below:

Bog Turtle:

Bog Turtles (*Glyptemys muhlenbergii*) are the smallest species of turtle native to North America, with adults "growing only to 4.5 inches in length [and] easily recognized by the orange patch on either side of its head" (The Nature Conservancy, 2020). This species was classified as federally threatened due to habitat loss and fragmentation relating to increased land development and forest succession. Populations and critical habitat have become fragmented, while populations of natural predators such as raccoons are growing. There are also concerns of reptile collectors poaching populations. (The Nature Conservancy, 2020). Upon further review, it was determined that the southern population of Bog turtle didn't fall under the threatened species criteria and was reclassified as SAT (Similarity of Appearance, Threatened) due to the lack of research around the southern population (Federal Register, 2021)

"The bog turtle favors open, groundwater-fed wet meadows and bogs dominated by tussock sedge (*Carex stricta*) and grasses. Bog turtles thrive in mountain bogs, or isolated

wetlands with acidic, wet soil, thick moss and deep layers of mud. These deep mucky soils, fed by groundwater, provides protection from predators and other elements. Short clumps of vegetation let in plenty of sunlight for incubating eggs and basking. If any of these conditions change, a bog turtle population can decline and may eventually disappear from the area." (The Nature Conservancy, 2020).

Observations:

No emergent seepage wetlands were observed on site. No bog turtles were observed on the sites and there is no potential bog turtle habitat. The actions on site will have no effect on bog turtles.

Tricolored Bat:

The tricolored bat (Perimyotis subflavus) is one of the smallest bats native to North America and gets its name from its unique tricolored fur pattern, which "often appears yellowish to nearly orange" (U.S. Fish and Wildife). The bats have "short round ears with a blunt, straight tragus. It can often be identified when hibernating by its distinctive orange forearm" (Texas Parks and Wildlife Department). Although once abundant, the tricolored bat is a candidate species for endangered status. "Tricolored bats face extinction due primarily to the range-wide impacts of white-nose syndrome, a deadly disease affecting cave-dwelling bats across the continent" (U.S. Fish and Wildlife).

The tricolored bats' habitat differs between winter and summer months. During the winter, these bats hibernate in caves and mines. In the south, where mines and caves are sparse, these bats will also roost in road associated culverts. "During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures." (U.S. Fish and Wildlife). "During summer, the sexes live separately; males are often solitary while females form small maternity colonies of 35 individuals or less in buildings, tree cavities, and rock crevices. The tricolored bat forages along forest edges and over ponds and waterways for small insects, such as leafhoppers, ground beetles, flies, small moths, and flying ants" (Texas Parks and Wildlife Department).

Observations:

No tricolored bats were observed on site. There were multiple hardwood trees and an abandoned house that may serve as summer roosting habitat. It is recommended that tree clearing activities be conducted during the bats' inactive months during the winter. The actions on site may affect, but are not likely to adversely affect tricolored bats.

4.3 Protected Flora

A list of protected plant species for Greenville County was provided by the U.S. Fish and Wildlife Service. Listed species, status, and on-site potential are summarized in Table 3. The results of this survey indicate that bunched arrowhead is present on site. None of the other plants listed for Greenville County were present on the target property.

None

No Effect

TABLE 3 PROTECTED FLORA SUMMARY GREENVILLE COUNTY, SOUTH CAROLINA						
Common Name Scientific Name Status On-Site Potential Impact						
Bunched Arrowhead	Sagittaria fasciculata	FE/ST	Present	MANLAA		
Dwarf-flowered Heartleaf	Hexastylis naniflora	FT/ST	None	No Effect		
Mountain Sweet Pitcher-plant	Sarracenia jonesii	FE/SE	None	No Effect		
Small Whorled Pogonia	Isotria medeoloides	FT/ST	None	No Effect		
Swamp Pink	Helonias bullata	FT/ST	None	No Effect		
White Fringeless Orchid	Platanthera integrilabia	FT/ST	None	No Effect		
White Irisette	Sisyrinchium dichotomum	FE/SE	None	No Effect		

FE = Federal Endangered, FT = Federal Threatened, SE = State Endangered, ST = State Threatened, CS = Species MANLAA= May Affect, Not Likely to Adversely Affect, MALAA=May Affect, Likely to Adversely Affect

Gymnoderma lineare

Bunched Arrowhead:

Rock Gnome Lichen

Bunched Arrowhead (*Sagittaria fasciculata*) is a semiaquatic perennial herb that flowers April through July and grows to be about 15 inches tall. "Submerged leaves are long and narrow, round in cross-section. Emerging leaves are flat, broadly ovate or lanceolate," (South Carolina Native Plant Society).

FE/SE

Bunched arrowhead is classified as federally endangered, primarily due to habitat destruction. "The bunched arrowhead now occurs naturally only within five square miles of Travelers Rest (and Furman.)," (Young, 2004).

All known bunched arrowhead populations are found in springhead seepage forests in the upper piedmont, with the best intact sites found in the vicinity of Travelers Rest, SC. "All known springhead forests in South Carolina are bounded by Pacolet sandy loam soils," which allow for the proper uptake, storage, and slow release of rainwater as seepage (Porcher, 2001, pp. 84-85).

Observations:

Piedmont seepage wetlands were observed on site within the piedmont seepage forest habitat type. A population of over 100 plants were observed in the northern potion of the piedmont seepage forest, near the intersection of Coleman Road and East Bowers Road. The location and limits of the population can be seen in the reference figures attached to this report.

The project design plan avoids all impacts to aquatic resources, the area that contains the bunched arrowhead population, and the hillslope above the seepage wetland. We believe that the actions on site may affect, but are not likely to adversely affect bunched arrowhead.

Dwarf-flowered Heartleaf:

Dwarf-flowered heartleaf (*Hexastylis naniflora*) is an evergreen perennial herb with heart-shaped, often variegated leaves. It can be distinguished from other heartleaf species

(such as *Hexastylis heterophylla*) by the dimensions of their flowers, which emerge between mid-March and early June.

Dwarf-flowered heartleaf is currently listed by the USFWS as threatened due to habitat destruction (NCSU Herbarium). The threatened status is currently under review as of April 23, 2020 and is proposed to be delisted. This is due to the discovery and protection of more populations since the species listing in 1989 (U.S. Fish & Wildlife Service).

Dwarf-flowered heartleaf is restricted to upper piedmont of South Carolina and North Carolina in acidic sandy soils such as "Pacolet or Madison gravelly sandy loam, or Musella fine sandy loam" (NCSU Herbarium). Populations can be found "along bluffs and north-facing slopes, boggy areas along streams, and adjacent hillsides and ravines with acid, sandy loam soils in deciduous forests. [It is also] usually associated with *Kalmia latifolia* or *Asimina triloba*" (NCSU Herbarium).

Observations:

Pacolet or Madison sandy loam is not present on site. There were no sandy bluffs or steep hillslopes present within the project area. No dwarf-flowered heartleaf or habitat was observed on site. There is no potential for take of dwarf-flowered heartleaf and the actions on the sites will have no effect on dwarf-flowered heartleaf.

Mountain Sweet Pitcher-plant:

Mountain sweet pitcher-plant (*Sarracenia jonesii*) is a perineal carnivorous plant. Modified leaves form hollow tubes that are typically 15 to 30 inches tall and are used to capture insects. Flowers are typically a dark red, smell sweet, and emerge in late spring and early summer (NC State).

Mountain sweet pitcher-plants are classified by the USFWS as federally endangered due to habitat destruction and limited habitat availability.

Mountain sweet pitcher-plant populations can be found in North Carolina and South Carolina, with populations in South Carolina being very rare and restricted to cataract bogs and piedmont seepage bogs (Porcher, 2001, p. 117). Cataract bogs are a type of seepage wetland found in the Blue Ridge Mountains and are often associated with granitic domes. These communities are fed by seepage where "streams slide over rocky outcrops that have a nearly horizontal component" and "light is abundant" (Porcher, 2001, p. 71). Piedmont seepage bogs are found in the piedmont seepage forest community in the upper piedmont. These communities are characterized by abundant light, constant seepage flow throughout the year, and Pacolet sandy loam soils, which allow the proper uptake, storage, and release of water into the seepage wetland (Porcher, 2001, p. 85).

Observations:

No bog habitat types were observed on site. There is no potential take for mountain sweet pitcher-plant and the actions on the sites will have no effect on mountain sweet pitcher-plant.

Small Whorled Pogonia:

The small whorled pogonia (*Isotria medeoloides*) is a perennial member of the orchid family. Stems are typically 2 to 14 inches tall with 5 or 6 leaves on top in a circular arrangement. Flowers emerge in late spring and early summer. Dormancy is not fully understood in this species but estimates as to how long individual plants may remain dormant range from 4 to 20 years (U.S. Fish & Wildlife Service, 2008; U.S. Fish & Wildlife Service, 1992). This makes population monitoring difficult and the discovery of new populations dependent on if individuals emerged at the time of a site visit.

Small whorled pogonia is currently listed as threatened by the USFWS. Population dynamics are not fully understood due to limited research. The primary threat to populations is habitat destruction due to land development. There are also concerns relating to increased herbivory from deer, rabbits, and introduced invertebrate species, but research is limited (U.S. Fish & Wildlife Service, 2008).

Because limited research has been conducted on the small whorled pogonia, especially in its southern range, understanding of its habitat requirements are limited. Populations of small whorled pogonia have be found in a wide range of soil types, moisture levels, and forest succession levels. Common habitat characteristics seem to be hillslopes with: sparse to moderate ground cover; a relatively open understory canopy; a moderate amount of leaf litter or decaying plant matter; and proximity to semi-permanent breaks in the canopy, such as logging roads, stream beds, or fallen trees which allow light intrusion into the forest floor (U.S. Fish & Wildlife Service, 1992).

Observations:

No small-whorled pogonia was observed on site at the time of the site visit. No small-whorled pogonia habitat was observed on site and the actions on the sites will have no effect on the small whorled pogonia.

Swamp Pink:

Swamp pink (*Helonias bullata*) is an herbaceous plant with "smooth, oblong, dark green leaves that form an evergreen rosette. In spring, some rosettes produce a flowering stalk that can grow over 3 feet tall. The stalk is topped by a 1 to 3-inch-long cluster of 30 to 50 small, fragrant, pink flowers dotted with pale blue anthers. The evergreen leaves of swamp pink can be seen year round, and flowering occurs between March and May" (U.S. Fish and Wildlife Service).

"Helonoias bullata is an obligate wetland species occurring along streams and seepage areas in freshwater swamps and other wetland habitats." The only known population in South Carolina is located in Matthews Creek Bog within the Mountain Bridge Wilderness and Recreation Area. This is the only known example of a montane bog within South Carolina and has experienced significant succession within the last 50 years (Porcher, 2001, p.410).

Swamp pink is listed as threatened by the USFWS. "The major threat to this species is loss and degradation of its wetland habitat due to encroaching development, sedimentation,

pollution, succession, and wetland drainage. In addition, the species exhibits extremely low seedling establishment," (U.S. Fish and Wildlife Service, 1991).

Observations:

No swamp pink or bog habitat types were observed within the project area and there is no potential habitat for swamp pink. The actions on the sites will have no effect on swamp pink.

White Fringeless Orchid:

White fringeless orchid (*Platanthera integrilabia*) is a perennial herb with multiple white flowers.

"This plant is typically found in partially shaded, flat, boggy areas at the head of streams or seepage slopes. The species is often found in association with Sphagnum species and *Osmunda cinnamonea, Woodwardia areolata*, and *Thelyptris novaboracensis*, in acidic muck or sand" (Pistrang).

Known populations in South Carolina are restricted to cataract bogs that are both fragile and dangerous to visit (Porcher, 2001, p. 118). Cataract bogs are a type of seepage wetland found in the Blue Ridge Mountains and are often associated with granitic domes. These communities are feed by seepage where "streams slide over rocky outcrops that have a nearly horizontal component" and "light is abundant" (Porcher, 2001, p. 71).

The white fringeless orchid is listed as threatened by the USFWS due to limited habitat availability. "Threats to this species include alteration of the habitat primarily through alteration of hydrology" (Pistrang).

Observations:

No bogs or cataract bogs were found on site. There is no potential for take of white fringeless orchid and actions on the sites will have no effect on white fringeless orchid.

White Irisette:

White irisette (*Sisyrinchium dichotomum*) is a perennial herb with branching stems and small white flowers. Flowers emerge from May – July. (NCSU Herbarium).

White iresette has historically been found in the northern, more mountainous portion of Greenville County, with Greenville being the only county in South Carolina with documented populations.

White irisette is associated with areas that experience moderate levels of disturbance that exhibit thin, slightly eroded, and/or disturbed soils, a fairly open canopy, and less accumulated leaf litter. Examples include powerline rights-of-way roadsides, and areas subject to fire (both natural and prescribed) (U.S. Fish & Wildlife Service, 2010).

The white irisette is listed as endangered by the USFWS. Threats to populations and habitat include land development, suppression of disturbances such as fire, and competition from invasive exotic plants.

Observations:

No white irisette was observed on site; however, the managed field habitat type may serve as potential habitat. There is no potential for take of white irisette and actions on the sites will have no effect on white irisette.

Rock Gnome Lichen:

Rock gnome lichen (*Gymnoderma lineare*) is a blue-gray fruticose lichen that grows in "dense colonies of narrow, strap-like lobes, called squamules. Most populations are only "one square meter or less in size" (NCSU Herbarium).

Rock gnome lichen is found on rock faces that experience high levels of humidity such as elevations above 5,000 feet or in deep river valleys and gorges. These are typically nearly vertical rock faces that are occasionally exposed to seepage and are either north facing or have partial canopy coverage due to the lichen's sensitivity to solar radiation (NCSU Herbarium).

Rock gnome lichen is listed as endangered due to limited distribution and few populations. Major threats include: habitat disturbance through logging, walking paths, and possibly air pollution (U.S. Fish & Wildlife Service, 1997; U.S. Forest Service).

Observations:

No rock gnome lichen or potential habitat for rock gnome lichen were observed on site. There is no potential for take of rock gnome lichen and actions on sites will have no effect on rock gnome lichen.

5.0 CONCLUSIONS

The conclusions presented herein are based on field observations and comparisons of habitat requirements of listed protected species of flora and fauna for Greenville County.

Based upon the USFWS IPaC species list, the SCDNR Heritage Trust report, and field observations conducted by Blueline personnel, our conclusion is as follows:

No tricolored bats were observed on site. There were multiple hardwood trees and an abandoned house that may serve as summer roosting habitat. It is recommended that tree clearing activities be conducted during the bats' inactive months during the winter. The actions on site may affect, but are not likely to adversely affect tricolored bats.

Bunched arrowhead was documented on site by SCDNR in 1994. A population of over 100 individuals of bunched arrowhead were observed on site in the northwestern portion of the piedmont seepage forest. The geographic limits of this population were surveyed and can be observed in the reference figures included within this report. Any impact to the

Endangered Species Habitat Assessment E Bowers Rd Blueline Project No. 2197

identified population should be avoided. Impacts (such as grading) to the hillslope above the population should be avoided as not to disturb the hydrology of the piedmont seepage wetland.

The project design plan avoids all impacts to aquatic resources, the area that contains the bunched arrowhead population, and the hillslope above the seepage wetland. We believe that the actions on site may affect but are not likely to adversely affect bunched arrowhead.

No suitable habitat or individuals of bog turtles, dwarf-flowered heartleaf, mountain sweet pitcher-plant, small whorled pogonia, swamp pink, white fringeless orchid, white irisette, or rock gnome lichen were observed on site.

6.0 REFERENCES AND FIELD GUIDES

NC State. *Sarracenia jonesii*. North Carolina Extension Gardener Plant Toolbox. https://plants.ces.ncsu.edu/plants/sarracenia-jonesii/

NCSU Herbarium. Dwarf-flowered heartleaf. ncsu.edu.

https://projects.ncsu.edu/cals/plantbiology/ncsc/rare/images/Hexastylis_naniflora_NHP.pdf

NCSU Herbarium. Rock gnome lichen. ncsu.edu.

https://projects.ncsu.edu/cals/plantbiology/ncsc/rare/images/Gymnoderma_lineare_NHP.pd f

NCSU Herbarium. White irisette. ncsu.edu.

https://projects.ncsu.edu/cals/plantbiology/ncsc/rare/images/Sisyrinchium_dichotomum_N HP.pdf

Pistrang, M. Plant of the Week: White Fringeless Orchid (Platanthera integrilabia (Correll) Luer). U.S. Forest Service.

https://www.fs.usda.gov/wildflowers/plant-of-the-week/platanthera_integrilabia.shtml

Porcher, R.D., & Rayner, D. A. (2001). A Guide to the Wildflowers of South Carolina. University of South Carolina Press.

South Carolina Department of Natural Resources. *Piedmont Ecoregion Terrestrial Habitats*. statelibrary.sc.gov

https://dc.statelibrary.sc.gov/bitstream/handle/10827/11302/DNR Piedmont Ecoregion Terrestrial Habitats 2005.pdf?sequence=1&isAllowed=y

South Carolina Native Plant Society. *Bunched Arrowhead (Sagittaria fasciculata)*. scnps.org

https://scnps.org/about-the-plants/bunched-arrowhead-sagittaria-fasciculata

Texas Parks and Wildlife Department. *Tricolored Bat (Perimyotis subflavus)*. tpwd.texas.gov

https://tpwd.texas.gov/huntwild/wild/species/easpip/

The Nature Conservancy. (2020, May 11). Bog Turtle (Glyptemys muhlenbergii). The Nature Conservancy. Retrieved August 15, 2022, from https://www.nature.org/en-us/get-involved/how-to-help/animals-we-protect/bog-turtle/

U.S. Fish & Wildlife Service. *Decision on delisting the dwarf-flowered heartleaf, Hexastylis naniflora.* fws.gov.

https://www.fws.gov/project/decision-delisting-dwarf-flowered-heartleaf-hexastylis-naniflora

U.S. Fish & Wildlife Service, New England Field Office. (2008). *Small Whorled Pogonia (Isotria medeoloides) 5- Year Review: Summary and Evaluation*. ecos.fws.gov https://ecos.fws.gov/docs/tess/species_nonpublish/1302.pdf

U.S. Fish & Wildlife Service. (1997). *Recovery Plan for Rock Gnome Lichen (Gymnoderma lineare) (Evans) Yoshimura and Sharp*. ecos.fws.gov https://ecos.fws.gov/docs/recovery_plans/1997/970930b.pdf

U.S. Fish & Wildlife Service, Southeast Region, Asheville Ecological Services Field Office. (2010). White irisette (Sisyrinchium dichotomum) 5- Year Review: Summary and Evaluation. ecos.fws.gov

https://ecos.fws.gov/docs/five_year_review/doc4148.pdf

U.S. Fish and Wildlife Service. *Swamp Pink*. fws.gov https://www.fws.gov/species/swamp-pink-helonias-bullata

U.S. Fish & Wildlife Service. (1991). Swamp Pink (Helonias bullata) Recovery Plan. ecos.fws.gov.

https://ecos.fws.gov/docs/recovery_plan/910930c.pdf

U.S. Fish & Wildlife Service. (1992). *Small Whorled Pogonia (Isotria medeoloides) Recovery plan: First Revision*. ecos.fws.gov. https://ecos.fws.gov/docs/recovery_plan/921113b.pdf

U.S. Forest Service. *Threatened, Endangered, and Proposed (TEP) Plant Profile: Gymnoderma lineare, rock gnome lichen.* fs.usda.gov
https://www.fs.usda.gov/wildflowers/Rare_Plants/profiles/TEP/gymnoderma_lineare/index.shtml

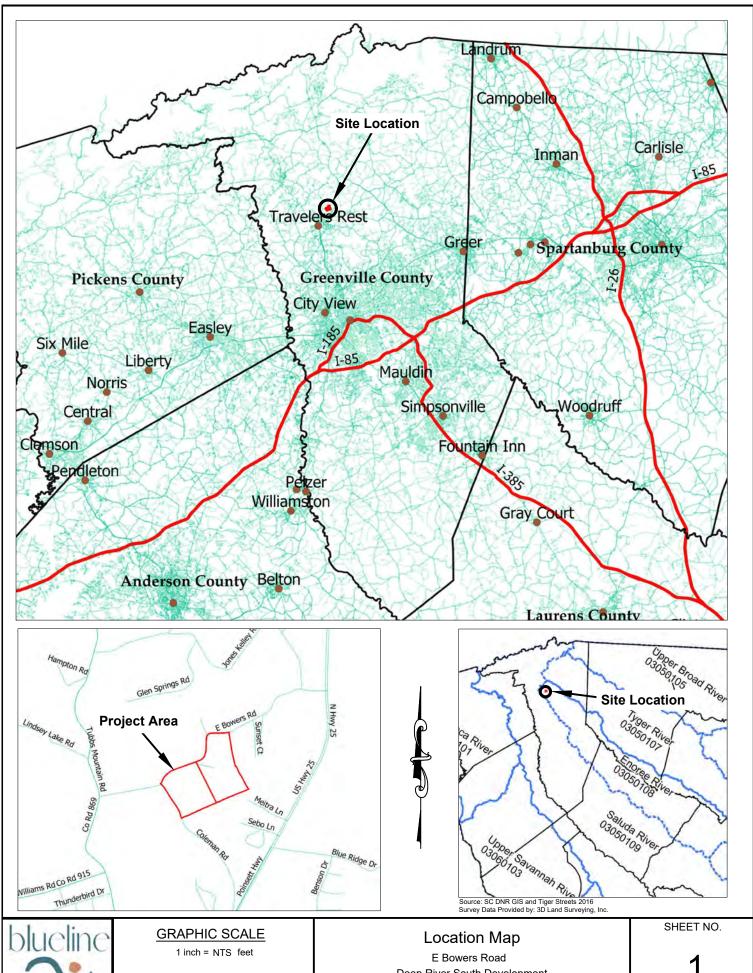
U.S. Fish and Wildlife Service. Tricolored bat (Perimyotis subflavus). ecos.fws.gov https://ecos.fws.gov/ecp/species/10515

Young, S.H. (2004, October 15). *Bunched Arrowhead – Saggitaria fasciculata*. South Carolina Wildlife Federation. https://www.scwf.org/bunched-arrowhead.

Endangered Species Habitat Assessment E Bowers Rd Blueline Project No. 2197

Appendix 1

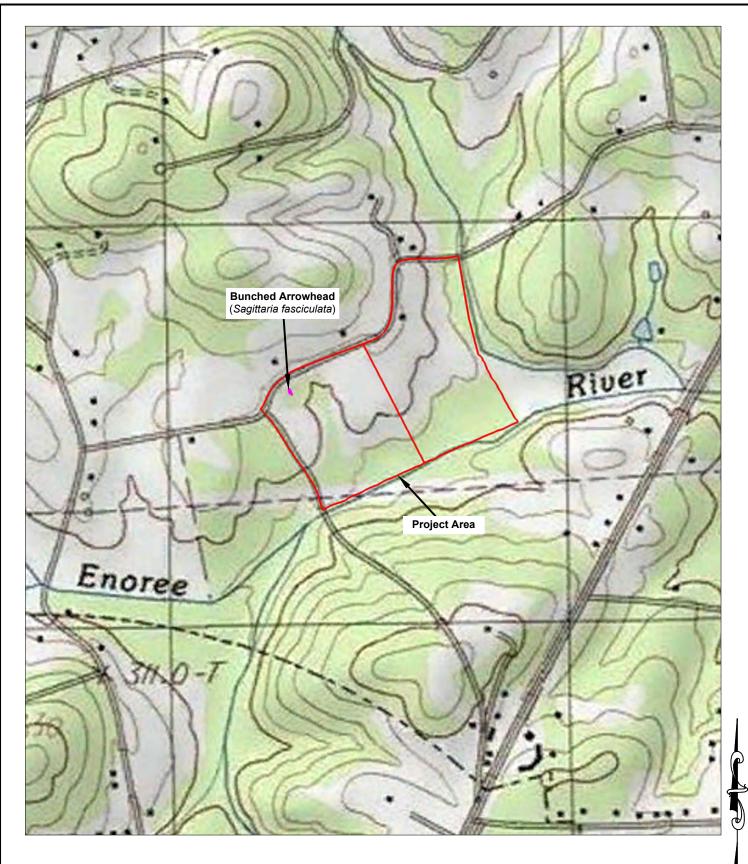
REFERENCE FIGURES



ENVIRONMENTAL CONSULTANTS, LLC

710 Lowndes Hill Road Greenville, SC 29607	DRAWN BY:		тсо
	DATE:	2023	1206
Phone: (803) 603-3479	BLUELINE PROJECT N	0.:	2197

Deep River South Development Greenville County, South Carolina



Source: https://services.arcgisonline.com/ArcGIS/rest/services/USA_Topo_Maps/MapServer via Google Earth Survey Data Provided by: 3D Land Surveying, Inc.



GRAPHIC SCALE

1 inch = 800 feet

0 Lowndes Hill Road ireenville, SC 29607 ione: (803) 603-3479	DRAWN BY:	TCC
	DATE:	20231206
	BLUELINE PROJECT NO	D.: 2197

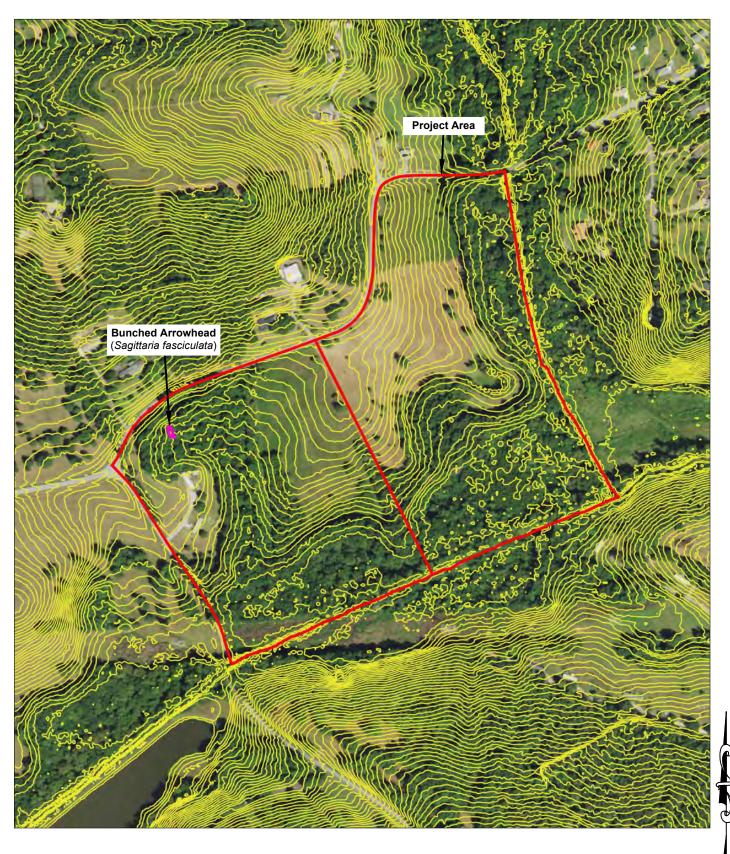
Water Features USGS Topo

E Bowers Road

Deep River South Development

Greenville County, South Carolina

SHEET NO.



Source: https://datagateway.nrcs.usda.gov/GDGHome.aspx Survey Data Provided by: 3D Land Surveying, Inc.



GRAPHIC SCALE

1 inch = 400 feet

O Lawadaa Hill Bood	DRAWN BY:		TCO
0 Lowndes Hill Road reenville, SC 29607 one: (803) 603-3479	DATE:	202	31206
one: (803) 603-3479	BLUELINE PROJEC	T NO.:	2197

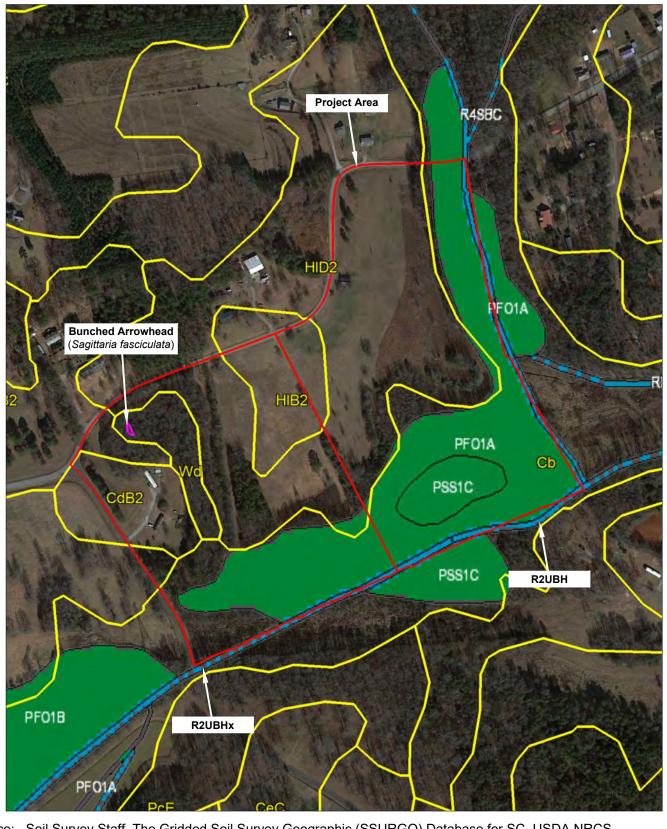
LIDAR 2ft Contour

E Bowers Road

Deep River South Development

Greenville County, South Carolina

SHEET NO.



Source: Soil Survey Staff. The Gridded Soil Survey Geographic (SSURGO) Database for SC, USDA NRCS Available online at http://datagateway.nrcs.usda.gov/. Accessed August 25, 2023. USFWS National Wetlands Inventory (NWI), last updated June 13, 2023.

Google Maps - 2021 Aerial

Survey Data Provided by: 3D Land Surveying, Inc.



GRAPHIC SCALE

1 inch = 400 feet

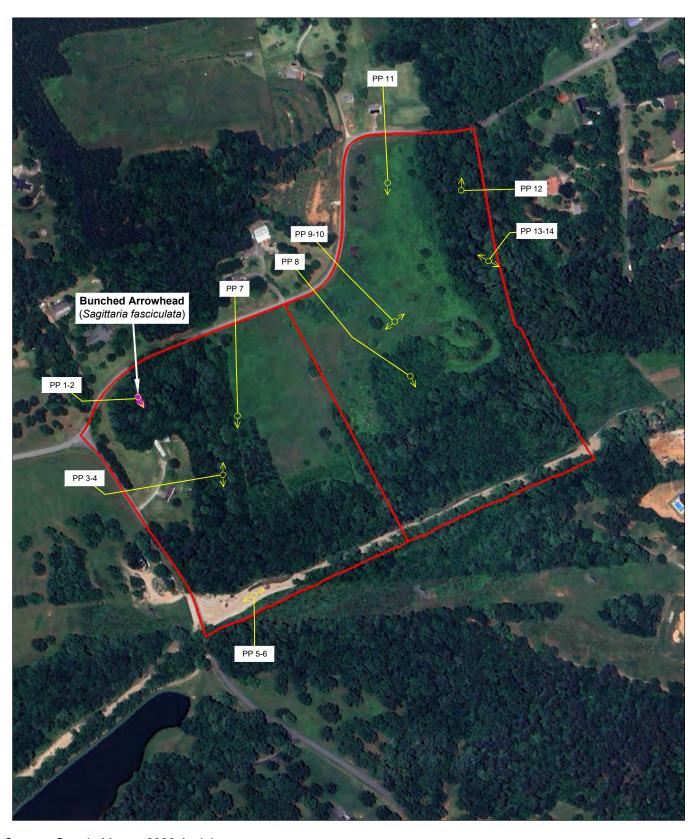
Soil/NWI Features

E Bowers Road

Deep River South Development

Greenville County, South Carolina

SHEET NO.



Source: Google Maps - 2023 Aerial Survey Data Provided by: 3D Land Surveying, Inc.



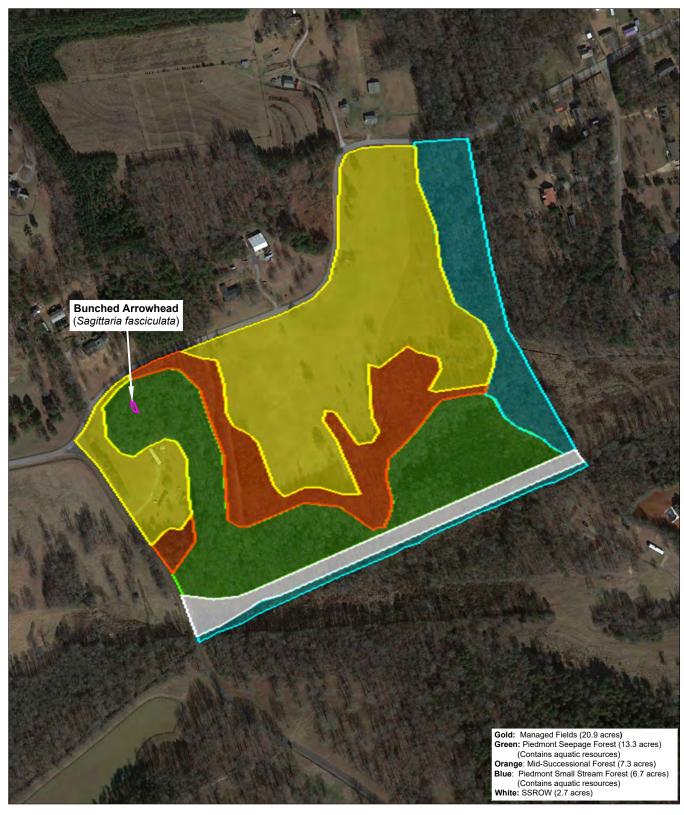
GRAPHIC SCALE

1 inch = 400 feet

710 Lowndes Hill Road Greenville, SC 29607 Phone: (803) 603-3479	DRAWN BY:		TCO
	DATE:	202	31206
	BLUELINE PROJECT	NO.:	2197

Photo Point Locations

E Bowers Road Deep River South Development Greenville County, South Carolina SHEET NO.



Source: Google Maps - 2021 Aerial Habitat boundaries are approximate and drawn in by Blueline Environmental Consultants, LLC



GRAPHIC SCALE

1 inch = 400 feet

Lowndes Hill Road eenville, SC 29607 ne: (803) 603-3479	DRAWN BY:	TCO
	DATE:	20231206
	BLUELINE PROJECT	NO.: 2197

Habitat Types

E Bowers Road

Deep River South Development

Greenville County, South Carolina

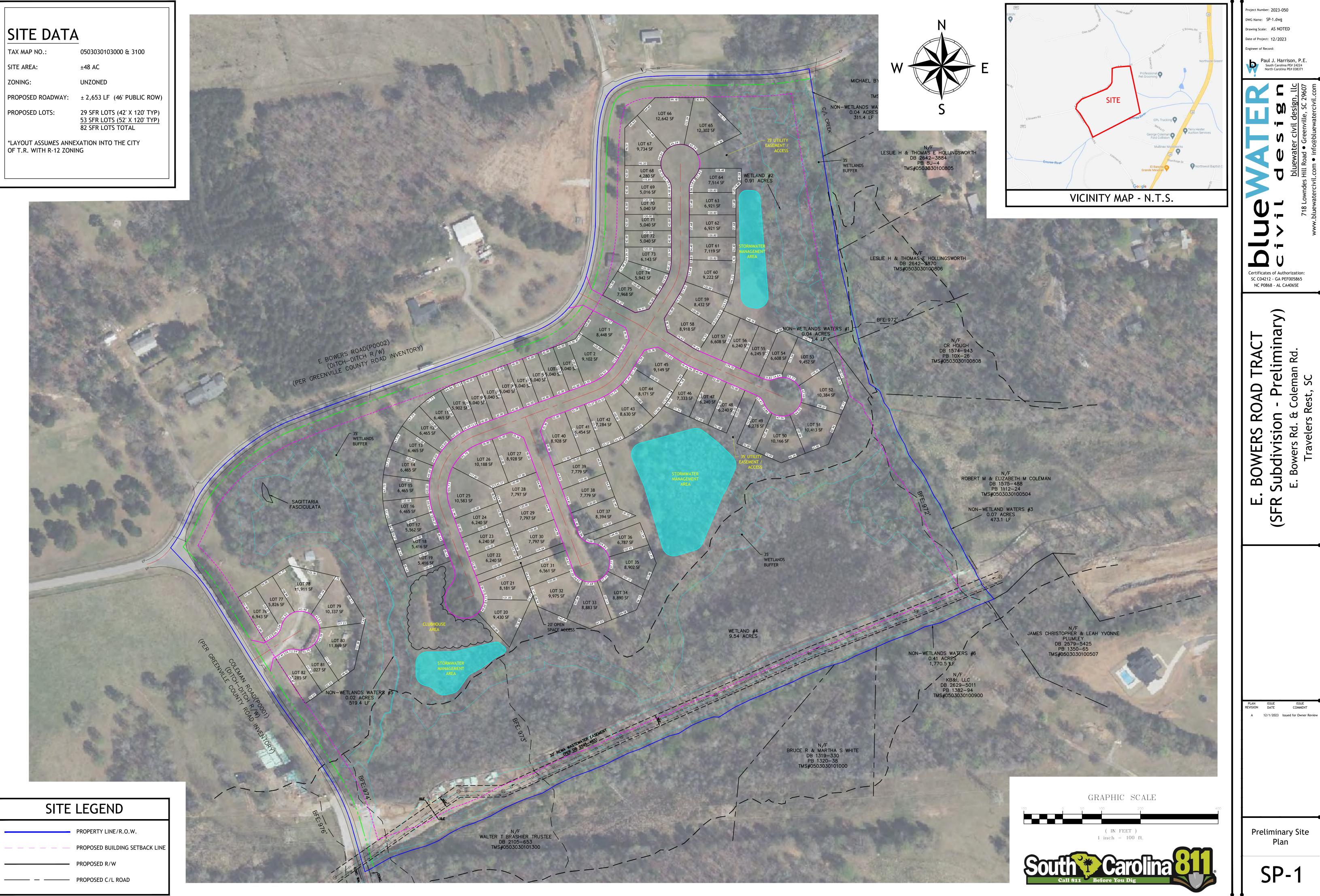
SHEET NO.



Endangered Species Habitat Assessment E Bowers Rd Blueline Project No. 2197

Appendix 2

CURRENT SITE PLAN



rawing Scale: AS NOTED Paul J. Harrison, P.E.
South Carolina PE# 24224
North Carolina PE# 038371

division

Plan

SP-1

THIS DRAWING AND ASSOCIATED .DWG FILES ARE THE PROPERTY OF BLUEWATER CIVIL DESIGN, LLC AND SHALL NOT BE MODIFIED, USED, OR REPRODUCED IN ANY WAY OTHER THAN AUTHORIZED IN WRITING. © 2023 BLUEWATER CIVIL DESIGN, LLC

Endangered Species Habitat Assessment E Bowers Rd Blueline Project No. 2197

Appendix 3

REPRESENTATIVE PHOTOGRPAHS



Photo 1 Bunched arrowhead population.



Photo 2 Bunched arrowhead Individuals.



Photo 3 Piedmont seepage forest; looking upslope.



Photo 4 Piedmont seepage forest; looking downslope.



Photo 5 Top of SSROW; looking upslope.



Photo 6 Top of SSROW; looking downslope.



Photo 7 Mid-successional forest; looking south.



Photo 8 Mid-successional forest; looking downslope.



Photo 9 Top of managed field; looking south.



Photo 10 Managed field; looking northeast.



Photo 11 Managed field; looking southwest.



Photo 12 Piedmont small stream forest, looking north.



Photo 13 Piedmont small stream forest, looking upslope.



Photo 14 Piedmont small stream forest, looking downslope.

Endangered Species Habitat Assessment E Bowers Rd Blueline Project No. 2197

Appendix 4

AGENCY RESPONSES



PO Box 167 Columbia, SC 29202 (803) 734-1396 speciesreview@dnr.sc.gov State of South Carolina

Department of Natural Resources

P.O. Box 167 Columbia, SC 29202 803-734-3886

Robert H. Boyles, Jr., Director

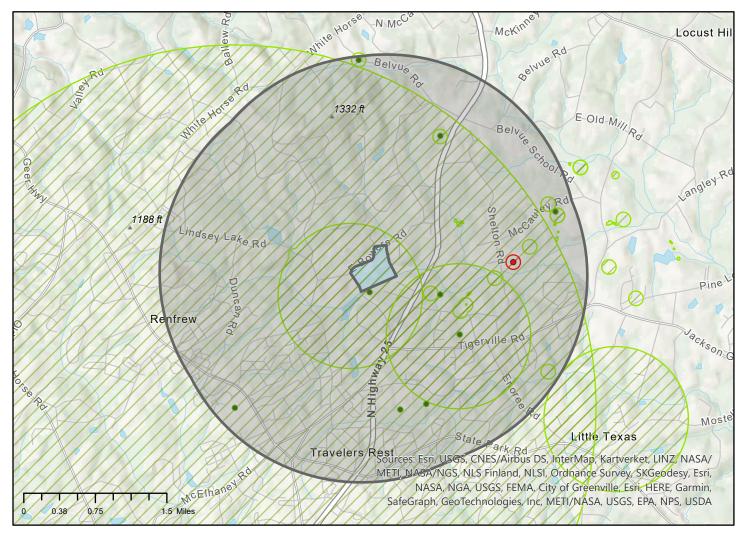
Emily C. Cope, Deputy Director, Wildlife and Freshwater Fisheries

Requested on Monday, August 28, 2023 by Thomas O'Neal.

Re: Request for Threatened and Endangered Species Consultation

Austin Evert, Deep River South Development - 2197 East Bowers Road - Development (Commercial/Residential) - Greenville County, South Carolina

The South Carolina Department of Natural Resources (SCDNR) has received your request for threatened and endangered species consultation of the above named project in Greenville County, South Carolina. The following map depicts the project area and a 2 mile buffer surrounding:





State of South Carolina

Department of Natural Resources

P.O. Box 167 Columbia, SC 29202 803-734-3886

Robert H. Boyles, Jr., Director Emily C. Cope, Deputy Director, Wildlife and Freshwater Fisheries

This report includes the following items:

- A A report for species which intersect the project area
- B A report for species which intersect the buffer around the project area
- C A list of best management practices relevant to species near to or within the project area
- D A list of best management practices relevant to the project type
- E A list of state & federally listed species within the county of the project area
- F Instructions to submit new species observation records to the SC Natural Heritage Program

Please be advised:

The contents of this report, including all tables, maps, recommendations, and various other text, are produced as a direct result of the information a user provides at the time of submission. The SCDNR assumes that all information submitted by the user represents the project scope as proposed, and recommends that additional reports be requested should the scope deviate from how the project was initially represented to the SCDNR.

The technical comments outlined in this report are submitted to speak to the general impacts of the activities as described through inquiry by parties outside the South Carolina Department of Natural Resources. These technical comments are submitted as guidance to be considered and are not submitted as final agency comments that might be related to any unspecified local, state or federal permit, certification or license applications that may be needed by any applicant or their contractors, consultants or agents presently under review or not yet made available for public review. In accordance with its policy 600.01, Comments on Projects Under Department Review, the South Carolina Department of Natural Resources, reserves the right to comment on any permit, certification or license application that may be published by any regulatory agency which may incorporate, directly or by reference, these technical comments.

Interested parties are to understand that SCDNR may provide a final agency position to regulatory agencies if any local, state or federal permit, certification or license applications may be needed by any applicant or their contractors, consultants or agents. For further information regarding comments and input from SCDNR on your project, please contact our Office of Environmental Programs by emailing environmental@dnr.sc.gov or by visiting www.dnr.sc.gov/environmental. Pursuant to Section 7 of the Endangered Species Act, requests for formal letters of concurrence with regards to federally listed species should be directed to the USFWS.

Should you have any questions or need more information, please do not hesitate to contact our office by email at speciesreview@dnr.sc.gov or by phone at 803-734-1396.

Sincerely,

Joseph Lemeris, Jr. Heritage Trust Program

SC Department of Natural Resources

A. Project Area - Species Report

There are 3 tracked species records found within the project foot print. The following table outlines occurrences found within the project footprint (if any), sorted by listing status and species name. Please keep in mind that this information is derived from existing databases and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. You can find more information about global and state rank status definitions by visiting Natureserve's web page. Please note that certain sensitive species found on site may be listed in this table but are not represented on the map. Please contact speciesreview@dnr.sc.gov should you have further questions related to sensitive species found within the project area.



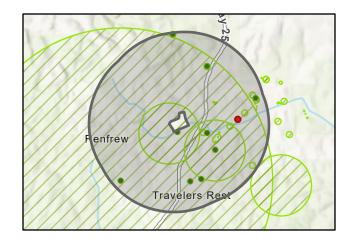
Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,

	Suns of 1-1-20
	Netral

Scientific Name	Common Name	Federal Protection Status	State Protection Status	G Rank	S Rank	SWAP Priority	Last Obs. Date
Sagittaria fasciculata	Bunched Arrowhead	LE: Federally Endangered	Not Applicable	G2	S2	Highest	2022-08-11
Monotropsis odorata	Appalachian Pigmy Pipes	Not Applicable	Not Applicable	G3	S2	High	1958-05-11
Platanthera lacera	Green Fringed Orchid, Ragged	Not Applicable	Not Applicable	G5	S2	Not Applicable	1979-06-20

B. Buffer Area - Species Report

The following table outlines rare, threatened or endangered species found within 2 miles of the project footprint, arranged in order of protection status and species name. Please keep in mind that this information is derived from existing databases and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. You can find more information about global and state rank status definitions by visiting Natureserve's web page. Please note that certain sensitive species found within the buffer area may be listed in this table but are not represented on the map.





Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, City of Greenville, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

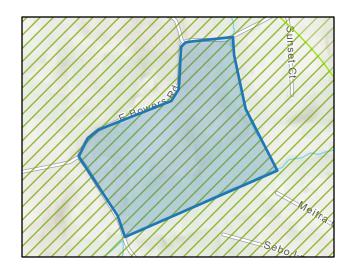
Scientific Name	Common Name	Federal Protection Status	State Protection Status	G Rank	S Rank	SWAP Priority	Last Obs. Date
Microtus pennsylvanicus	Meadow Vole	Not Applicable	Not Applicable	G5	S3?	High	2001-03-31
Sagittaria fasciculata	Bunched Arrowhead	LE: Federally Endangered	Not Applicable	G2	S2	Highest	2022-08-11
Sagittaria fasciculata	Bunched Arrowhead	LE: Federally Endangered	Not Applicable	G2	S2	Highest	1994
Sagittaria fasciculata	Bunched Arrowhead	LE: Federally Endangered	Not Applicable	G2	S2	Highest	2021-05-19
Sagittaria fasciculata	Bunched Arrowhead	LE: Federally Endangered	Not Applicable	G2	S2	Highest	2022-03-11
Sagittaria fasciculata	Bunched Arrowhead	LE: Federally Endangered	Not Applicable	G2	S2	Highest	2022-03-11
Hexastylis naniflora	Dwarf-flower Heartleaf	LT: Federally Threatened	Not Applicable	G3	S3	Highest	2021-08-13
Helenium brevifolium	Shortleaf Sneezeweed	Not Applicable	Not Applicable	G4	S1	Moderate	2022-05-17
Lygodium palmatum	American Climbing Fern,	Not Applicable	Not Applicable	G4	S3	Not Applicable	2021-07-28
Monotropsis odorata	Appalachian Pigmy Pipes	Not Applicable	Not Applicable	G3	S2	High	1958-05-11
Platanthera lacera	Green Fringed Orchid, Ragged	Not Applicable	Not Applicable	G5	S2	Not Applicable	1979-06-20
Thalictrum macrostylum	Small-leaved Meadowrue	Not Applicable	Not Applicable	G3G4	S1S2	High	2022-06-17

C. Species Best Management Practices (1 of 1)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to species of concern which may be found on or near to the project area. Please contact speciesreview@dnr.sc.gov should you have further questions with regard to survey methods, consultation, or other species-related concerns.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,



Dwarf-flowered heartleaf (Hexastylis naniflora) is a federally threatened evergreen perennial plant which grows in acidic soils along bluffs and adjacent slopes, boggy areas next to streams, and along slopes of nearby hillsides. Should ground-disturbance be associated with this project, surveys to rule out dwarf-flowered heartleaf within the project area are recommended. Should dwarf-flowered heartleaf be found within the project footprint, please consult with the U.S. Fish & Wildlife Service (843-727-4707) and notify the SCDNR Botanist (803-734-4032) before proceeding with any construction activities.

Bunched Arrowhead (Sagittaria fasciculata) is a federally endangered plant species which relies on undisturbed saturated soils (seeps) in/around deciduous woodlands. All appropriate best management practices to avoid negative impacts to wetlands should be adhered to by developers. Should bunched arrowhead be found within the project footprint, please consult with the U.S. Fish & Wildlife Service (843-727-4707) and notify the SCDNR Botanist (803-734-4032) before proceeding with any construction activities.

Cavity- and tree-roosting bat species including the federally endangered northern long-eared bat (Myotis septentrionalis), state-endangered Rafinesque's big-eared bat (Corynorhinus rafinesquii), and the federally at-risk tricolored bat (Perimyotis subflavus) have been known to occur in the county of the proposed site. As a conservation measure, it is recommended that any tree clearing activities be conducted during the inactive season for Northern long-eared bat (November 15th through March 31st) to avoid negative impacts to the species. If any of the above species are found on-site, please contact the USFWS and SCDNR.

In the interest of preserving plant diversity, the South Carolina Plant Conservation Alliance performs native plant rescues in order to protect and preserve our diversity of native plants. If you are interested in assisting with this important endeavor please contact Mr. Keith Bradley at (803) 734-4032, or by email: BradleyK@dnr.sc.gov before any development occurs onsite. There may be plants of interest on the project site that the Alliance would like to preserve.

Species in the above table with SWAP priorities of High, Highest or Moderate are designated as having conservation priority under the South Carolina State Wildlife Action Plan (SWAP). SWAP species are those species of greatest conservation need not traditionally covered under any federal funded programs. Species are listed in the SWAP because they are rare or designated as at-risk due to knowledge deficiencies; species common in South Carolina but listed rare or declining elsewhere; or species that serve as indicators of detrimental environmental conditions. SCDNR recommends that appropriate measures should be taken to minimize or avoid impacts to the aforementioned species of concern.

This project falls within an area that supports black bear (Ursus americanus) populations, a moderate SWAP conservation priority species that requires fire-dependent habitats. The SCDNR recommends that any project area be developed with that in mind. Black bears are attracted to human foods, food waste and packaging (e.g. trash cans, litter, outdoor grills, bird feeders, etc.) and other scented substances and may become habituated to the presence of such attractants if they are obtained. Therefore, the development should be designed in a manner that will substantially minimize the availability of unnatural bear attractants. For example, any exterior trash receptacles must be designed and operated to be 'bear proof' and storage areas should be appropriately secured to prevent access by bears, etc. Some helpful bear-wise tactics can be found at https://bearwise.org/six-bearwise-basics/.

D. Project Best Management Practices (1 of 4)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact our Office of Environmental Programs at environmental@dnr.sc.gov should you have further questions with regard to best management practices related to this project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,



Please note that the proposed project is near the a complex of properties including: Bunched Arrowhead Heritage Preserve, Blackwell Heritage Preserve, Belvue Springs Heritage Preserve, Clear Creek Heritage Preserve owned and managed by the SCDNR that protect the federally endangered bunched arrowhead plant (Sagitarria fasciculata). This species of plant relies on saturated soils fed by continuous seeps on gently sloping terrain in deciduous woodlands. Please note that deforestation and grading of the forested landscapes or altering surface water hydrology adjacent to these properties may have the potential to impact the existence of this federally protected species on these properties. The SCDNR recommends that further discussions occur with the property management staff and the agency botanist in addition to USFWS Charleston Ecological Services Field Office staff regarding any activities that may impact these species. To contact the USFWS staff, call 843-727-4707 and SCDNR staff call 803-734-4032.

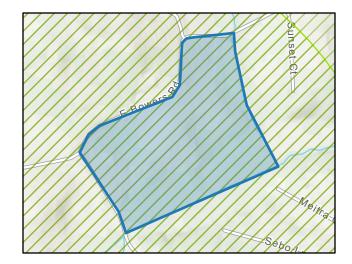
Review of available data, National Wetlands Inventory and hydric soils, indicate that wetlands or waters of the United States are present within your project area. These areas may require a permit from the U.S. Army Corps of Engineers (USACE), as well as a compensatory mitigation plan. SCDNR advises that you consult with the USACE Regulatory to determine if jurisdictional wetlands are present and if a permit and mitigation is required for any activities impacting these areas. For more information, please visit their website at www.sac.usace.army.mil/Missions/Regulatory. Additionally, a 401 Water Quality Certification may also be required from the SC Department of Health & Environmental Control. For more information, please visit their website at https://www.scdhec.gov/environment/water-quality/water-quality-certification-section-401-clean-water-act.

D. Project Best Management Practices (2 of 4)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact our Office of Environmental Programs at environmental@dnr.sc.gov should you have further questions with regard to best management practices related to this project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,



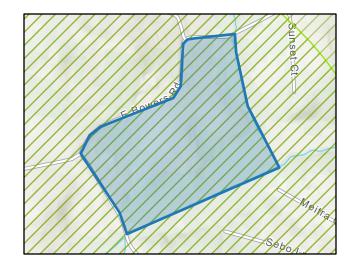
- All necessary measures must be taken to prevent oil, tar, trash and other pollutants from entering the adjacent offsite areas/wetlands/water
- Once the project is initiated, it must be carried to completion in an expeditious manner to minimize the period of disturbance to the environment.
- Upon project completion, all disturbed areas must be permanently stabilized with vegetative cover (preferable), riprap or other erosion control methods as appropriate.
- The project must be in compliance with any applicable floodplain, stormwater, land disturbance, shoreline management guidance or riparian buffer ordinances.
- Prior to beginning any land disturbing activity, appropriate erosion and siltation control measures (e.g. silt fences or barriers) must be in place and maintained in a functioning capacity until the area is permanently stabilized.
- · Materials used for erosion control (e.g., hay bales or straw mulch) will be certified as weed free by the supplier.
- Inspecting and ensuring the maintenance of temporary erosion control measures at least:
 - a. on a daily basis in areas of active construction or equipment operation;
 - b. on a weekly basis in areas with no construction or equipment operation; and
 - c. within 24 hours of each 0.5 inch of rainfall.
- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts.
- Land disturbing activities must avoid encroachment into any wetland areas (outside the permitted impact area). Wetlands that are unavoidably impacted must be appropriately mitigated.
- Your project may require a Stormwater Permit from the SC Department of Health & Environmental Control, please visit https://www.scdhec.gov/environment/water-quality/stormwater
- If clearing must occur, riparian vegetation within wetlands and waters of the U.S. must be conducted manually and low growing, woody vegetation and shrubs must be left intact to maintain bank stability and reduce erosion.
- Construction activities must avoid and minimize, to the greatest extent practicable, disturbance of woody shoreline vegetation within the project area. Removal of vegetation should be limited to only what is necessary for construction of the proposed structures.
- Where necessary to remove vegetation, supplemental plantings should be installed following completion of the project. These plantings should consist of appropriate native species for this ecoregion and exclude plant species found on the exotic pest plant council list: https://www.se-eppc.org/southcarolina/SCEPPC_LIST2014finalOct.pdf.

D. Project Best Management Practices (3 of 4)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact our Office of Environmental Programs at environmental@dnr.sc.gov should you have further questions with regard to best management practices related to this project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,



- Review of available data, National Hydrography Dataset, indicates that streams or waters of the United States are present within your project area. These areas may require a permit from the U.S. Army Corps of Engineers (USACE), as well as a compensatory mitigation plan. SCDNR advises that you consult with the USACE Regulatory to determine if jurisdictional waters are present and if a permit and mitigation is required for any activities impacting these areas. For more information, please visit their website at www.sac.usace.army.mil/Missions/Regulatory. Additionally, a 401 Water Quality Certification or a State Navigable Waters permit may also be required from the SC Department of Health & Environmental Control. For more information, please visit the following websites:
 - https://www.scdhec.gov/environment/water-quality/water-quality-certification-section-401-clean-water-act
 - https://www.scdhec.gov/environment/water-quality/navigable-waters
- Excavation/Construction activities must not occur during fish spawning season from March through June due to its negative impacts on eggs and reproduction activities.
- If clearing must occur, riparian vegetation within wetlands and waters of the U.S. must be conducted manually and low growing, woody vegetation and shrubs must be left intact to maintain bank stability and reduce erosion.
- Construction activities must avoid and minimize, to the greatest extent practicable, disturbance of woody shoreline vegetation
 within the project area. Removal of vegetation should be limited to only what is necessary for construction of the proposed
 structures.
- Where necessary to remove vegetation, supplemental plantings should be installed following completion of the project. These plantings should consist of appropriate native species for this ecoregion.

Your project area includes a FEMA special flood hazard area and may require a permit from the County National Floodplain Insurance Program Manager before impacts occur to aquatic resources and the associated floodplains on site. Please refer to https://www.dnr.sc.gov/water/flood/documents/nfipadmindirectory.pdf to find your appropriate contact information.

D. Project Best Management Practices (4 of 4)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact our Office of Environmental Programs at environmental@dnr.sc.gov should you have further questions with regard to best management practices related to this project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,



- Residential and commercial development has grown exponentially in recent years. Activities associated with these developments can have detrimental impacts on wildlife and aquatic resources such as habitat fragmentation, loss of available habitats and pollution, especially stormwater pollution. The result of these impacts causes the displacement of species and increases wildlife and human interactions. However, properly planned and sited development activities may allow for economic expansion with minimal negative impacts.
- Where appropriate, particularly adjacent to wetlands and water bodies, drainage plans and construction measures for residential and commercial development should be designed to control erosion and sedimentation, water quality degradation and other negative impacts on adjacent water and wetlands utilizing the best available design research. Developers proposing development activities should contact and work closely with local community development planning entities.
- Developments should be planned where growth is most compatible with natural resources utilizing residential and commercial cluster development methods, maximizing green spaces which can both be beneficial to protect natural resources and provide recreational opportunities for outdoor enthusiasts.
- Developments should be designed and constructed to avoid impact to wetland and stream areas whenever possible and to minimize unavoidable wetland and stream impacts to the maximum extent possible. Aquatic habitats and other sensitive natural areas should be identified in the initial planning stages of the project and incorporated in their natural state into the overall development plan.
- Developments should be designed to maintain the integrity and contiguity of wetland and stream systems and their associated riparian corridors, including the establishment of protective upland buffers around and between undisturbed aquatic systems whenever possible. Projects should be designed to minimize habitat fragmentation, including the construction of a limited number of road and utility crossings through streams and wetlands.
- The SCDNR recommends that the applicant incorporate vegetated bioswales, catch basins and/or bioretention cells/rain gardens into development plans beyond the regulatory requirements of the Stormwater Permitting requirements to add additional features to aid in capturing and filtering runoff from hardened surfaces. These structures can protect water quality and prevent oil, gas and other pollutants from directly entering nearby waterways. In addition, the SCDNR strongly recommends the use of permeable or porous pavement surfaces when possible. Permeable surfaces allow for rainfall to filter through the soil which aids in flood control and improves water quality.
- The following resources are available from Clemson Extension to assist:
 - https://hgic.clemson.edu/factsheet/an-introduction-to-bioswales/
 - https://hgic.clemson.edu/factsheet/rain-garden-plants-introduction/
 - https://hgic.clemson.edu/factsheet/bioretention-cells-a-guide-for-your-residents/
 - https://hgic.clemson.edu/factsheet/an-introduction-to-porous-pavement/
 - https://hgic.clemson.edu/factsheet/trees-for-stormwater-management/

E. State & Federally Listed Species in Greenville County

The South Carolina Department of Natural Resources' Heritage Trust Program organizes a database that captures and tracks element of occurrence data for rare, threatened and endangered species, both federal and state. Please keep in mind that this information included within this report is derived from existing databases, and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. If your project requires the assessment of potential threatened or endangered species that could be within the project area, the SCDNR asks that you include a review of the state listed species within the county or watershed in addition to those that may be within the report as being within the project footprint or within 1-mile of the proposed project area. Consideration should be given to the occurrence of suitable habitat onsite, species movement and connectivity of habitat when assessing the likelihood of a state listed species on the project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US

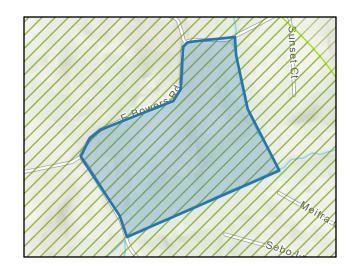
	Sun, sat-
	S SO O L

County	Scientific Name	Common Name	G Rank	S Rank	Federal Protection Status	State Protection Status	Group Type
Greenville	Bombus affinis	Rusty-patched Bumble Bee	G2	SH	LE: Federally Endangered	Not Applicable	Zoological
Greenville	Bombus pensylvanicus	American Bumble Bee	G3G4	SNR	ARS: At-Risk Species	Not Applicable	Zoological
Greenville	Cambarus spicatus	Broad River Spiny Crayfish	G3	S2	ARS: At-Risk Species	Not Applicable	Zoological
Greenville	Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2	Not Applicable	SE: State Endangered	Zoological
Greenville	Distocambarus carlsoni	Mimic Crayfish	G2G3	S2	ARS: At-Risk Species	Not Applicable	Zoological
Greenville	Eurycea chamberlaini	Chamberlain's Dwarf Salamander	G4	S3	ARS: At-Risk Species	Not Applicable	Zoological
Greenville	Falco peregrinus anatum	American Peregrine Falcon	G4T4	S1B,S1N	MBTA: Migratory Bird Treaty Act	ST: State Threatened	Zoological
Greenville	Glyptemys muhlenbergii	Bog Turtle	G2G3	S1	LTSA: Federally Threatened due to Similarity of Appearance	ST: State Threatened	Zoological
Greenville	Haliaeetus leucocephalus	Bald Eagle	G5	S3B,S3N	Bald & Golden Eagle Protection Act	ST: State Threatened	Zoological
Greenville	Myotis leibii	Eastern Small-footed Bat	G4	S1	Not Applicable	ST: State Threatened	Zoological
Greenville	Myotis lucifugus	Little Brown Bat	G3G4	S1S2	ARS: At-Risk Species	Not Applicable	Zoological
Greenville	Myotis septentrionalis	Northern Long-eared Bat	G2G3	S1	LE: Federally Endangered	Not Applicable	Zoological
Greenville	Perimyotis subflavus	Tricolored Bat	G3G4	S1S2	LEP: Federally Endangered (Proposed)	Not Applicable	Zoological
Greenville	Thryomanes bewickii	Bewick's Wren	G5	S1	MBTA: Migratory Bird Treaty Act	SE: State Endangered	Zoological
Greenville	Agalinis decemloba	Sandplain Agalinis	G3G4	S1	ARS: At-Risk Species	Not Applicable	Botanical
Greenville	Cetradonia linearis	Rock Gnome Lichen	G3	S1	LE: Federally Endangered	Not Applicable	Botanical
Greenville	Helonias bullata	Swamp Pink	G3	S1	LT: Federally Threatened	Not Applicable	Botanical
Greenville	Hexastylis naniflora	Dwarf-flower Heartleaf	G3	S3	LT: Federally Threatened	Not Applicable	Botanical
Greenville	Isotria medeoloides	Small Whorled Pogonia, Little Five-leaves	G2G3	S2	LT: Federally Threatened	Not Applicable	Botanical
Greenville	Platanthera integrilabia	Monkey-face Orchid, White Fringeless Orchid	G2G3	S1	LT: Federally Threatened	Not Applicable	Botanical
Greenville	Sagittaria fasciculata	Bunched Arrowhead	G2	S2	LE: Federally Endangered	Not Applicable	Botanical
Greenville	Sarracenia jonesii	Mountain Sweet Pitcherplant	G2	S1S2	LE: Federally Endangered	Not Applicable	Botanical
Greenville	Sarracenia purpurea var. montana	Southern Appalachian Purple Pitcherplant	G5T1T2	S1	ARS: At-Risk Species	Not Applicable	Botanical
Greenville	Sisyrinchium dichotomum	White Irisette, Isothermal Irisette	G2	S1	LE: Federally Endangered	Not Applicable	Botanical
Greenville	Tsuga caroliniana	Carolina Hemlock	G2G3	S2	ARS: At-Risk Species	Not Applicable	Botanical

F. Instructions for Submitting Species Observations

The SC Natural Heritage Dataset relies on continuous monitoring and surveying for species of concern throughout the state. Any records of species of concern found within this project area would greatly benefit the quality and comprehensiveness of the statewide dataset for rare, threatened and endangered species. Below are instructions for how to download the SC Natural Heritage Occurrence Reporting Form through the Survey123 App.

Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Greenville, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,



Conservation Ranks & SWAP Priority Status

The SC Natural Heritage Program assigns S Ranks for species tracked within the state of South Carolina based on ranking methodology developed by NatureServe and its state program network. For information conservation rank definitions, please visit https://explorer.natureserve.org/AboutTheData/Statuses

The SCDNR maintains and updates it's State Wildlife Action Plan (SWAP) every 10 years. This plan categorizes species of concern by Moderate, High, and Highest Priority. Please visit https://www.dnr.sc.gov/swap/index.html for more information about the SC SWAP.

Important Information Regarding Element Occurrence Data:

The South Carolina Department of Natural Resources' Heritage Trust Program organizes a database that captures and tracks element of occurrence data for rare, threatened and endangered species, both federal and state. Please keep in mind that this information included within this report is derived from existing databases, and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. If your project requires the assessment of potential threatened or endangered species that could be within the project area, the SCDNR asks that you include a review of the state listed species within the county or watershed in addition to those that may be within the report as being within the project footprint or within 1-mile of the proposed project area. Consideration should be given to the occurrence of suitable habitat onsite, species movement and connectivity of habitat when assessing the likelihood of a state listed species on the project area. To view these lists please visit our county and watershed dashboards at our website: https://schtportal.dnr.sc.gov/portal/apps/sites/#track

Instructions for accessing the SC Natural Heritage Occurrence Reporting Form

For use in a browser (on your desktop/PC):

- 1) Follow https://bit.ly/scht-reporting-form
- 2) Select 'Open in browser'
- 3) The form will open and you can begin entering data!

This method of access will also work on a browser on a mobile device, but only when connected to the internet. To use the form in the field without relying on data/internet access, follow the steps below.

For use on a smartphone or tablet using the field app:

- 1) Download the Survey123 App from the Google Play store or the Apple Store. This app is free to download. Allow the app to use your location.
- 2) Use the camera app (or other QR Reader app) to scan the QR code on this page from your smartphone or tablet. Click on the 'Open in the Survey123 field app'. This will prompt a window to allow Survey123 to download the SC Natural Heritage Occurrence Reporting Form. Select 'Open.'
- 3) The form will automatically open in Survey123, and you can begin entering data! This form will stay loaded in the app on your device until you manually delete it, and you can submit as many records as you like.







United States Department of the Interior



FISH AND WILDLIFE SERVICE

South Carolina Ecological Services 176 Croghan Spur Road, Suite 200 Charleston, SC 29407-7558 Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To: December 01, 2023

Project Code: 2024-0021727

Project Name: Blueline Project #2197 E Bowers RD

Subject: List of threatened and endangered species that may occur in your proposed project

location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

South Carolina Ecological Services 176 Croghan Spur Road, Suite 200 Charleston, SC 29407-7558 (843) 727-4707

PROJECT SUMMARY

Project Code: 2024-0021727

Project Name: Blueline Project #2197 E Bowers RD

Project Type: Residential Construction

Project Description: This is a 50.9 acre residential development project located south of East

Bowers Road and west of Coleman Rd in Travelers Rest, SC. The project will involve land clearing, grading, and the construction of roads, utility

lines, and residential buildings. The timing is unknown.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.98960024999995,-82.42905489361333,14z



Counties: Greenville County, South Carolina

ENDANGERED SPECIES ACT SPECIES

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

REPTILES

NIANTE

IVAIVIE	SIAIUS
Bog Turtle <i>Glyptemys muhlenbergii</i>	Similarity of
Population: U.S.A. (GA, NC, SC, TN, VA)	Appearance
No critical habitat has been designated for this species.	(Threatened)
Species profile: https://ecos.fws.gov/ecp/species/6962	(1111cutenicu)

CTATIC

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i>	Candidate

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743

FLOWERING PLANTS

NAME

Bunched Arrowhead Sagittaria fasciculata

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/1720

Dwarf-flowered Heartleaf Hexastylis naniflora

Threatened

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/2458

Mountain Sweet Pitcher-plant Sarracenia rubra ssp. jonesii Endangered

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4283

Small Whorled Pogonia *Isotria medeoloides*Threatened

Population:

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890

Swamp Pink *Helonias bullata* Threatened

Population:

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4333

White Fringeless Orchid *Platanthera integrilabia*Threatened

Population:

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1889

LICHENS

NAME STATUS

Endangered

Rock Gnome Lichen *Gymnoderma lineare*

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3933

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act¹ and the Migratory Bird Treaty Act².

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats³, should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

- 1. The Bald and Golden Eagle Protection Act of 1940.
- 2. The Migratory Birds Treaty Act of 1918.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO BALD AND GOLDEN EAGLES WITHIN THE VICINITY OF YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Black-billed Cuckoo <i>Coccyzus erythropthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental	Breeds May 15 to Oct 10
USA and Alaska.	
https://ecos.fws.gov/ecp/species/9399	
Chimney Swift <i>Chaetura pelagica</i>	Breeds Mar 15 to Aug
This is a Bird of Conservation Concern (BCC) throughout its range in the continental	25
USA and Alaska.	
https://ecos.fws.gov/ecp/species/9406	

12/01/2023

NAME BREEDING SEASON

Kentucky Warbler Oporornis formosus

Breeds Apr 20 to Aug

This is a Bird of Conservation Concern (BCC) throughout its range in the continental 20 USA and Alaska.

https://ecos.fws.gov/ecp/species/9443

Prairie Warbler *Dendroica discolor*

Breeds May 1 to Jul

This is a Bird of Conservation Concern (BCC) throughout its range in the continental 31 USA and Alaska.

https://ecos.fws.gov/ecp/species/9513

Prothonotary Warbler Protonotaria citrea

Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9439

Red-headed Woodpecker Melanerpes erythrocephalus

Breeds May 10 to Sep

This is a Bird of Conservation Concern (BCC) throughout its range in the continental 10 USA and Alaska.

https://ecos.fws.gov/ecp/species/9398

Rusty Blackbird Euphagus carolinus

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation

Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478

Wood Thrush Hylocichla mustelina

Breeds May 10 to

This is a Bird of Conservation Concern (BCC) throughout its range in the continental $\mbox{Aug } 31$ USA and Alaska.

https://ecos.fws.gov/ecp/species/9431

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

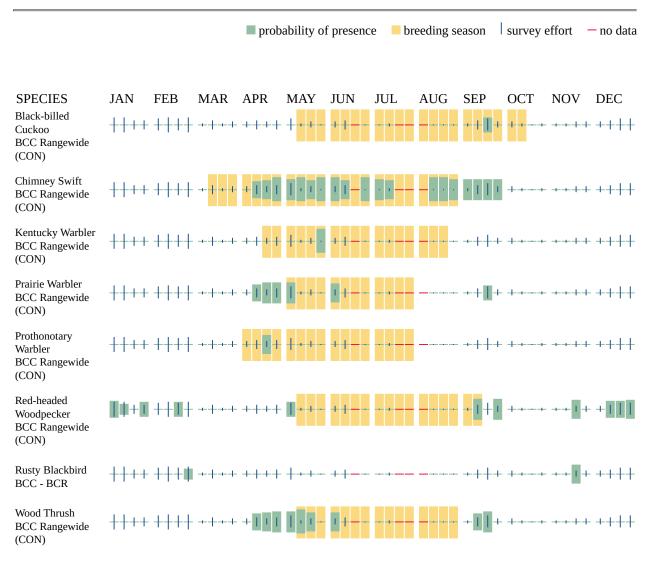
Breeding Season (

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (1)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–) A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of</u> Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R2UBHx
- R2UBH

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A
- PSS1C

12/01/2023

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Thomas O'Neal

Address: 710 Lowndes Hill Road

City: Greenville

State: SC Zip: 29607

Email thomas@enviropermit.com

Phone: 8036033479

LEAD AGENCY CONTACT INFORMATION

Lead Agency: County of Greenville



United States Department of the Interior



FISH AND WILDLIFE SERVICE

South Carolina Ecological Services 176 Croghan Spur Road, Suite 200 Charleston, SC 29407-7558 Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To: December 04, 2023

Project code: 2024-0021727

Project Name: Blueline Project #2197 E Bowers RD

Subject: Consistency letter for 'Blueline Project #2197 E Bowers RD' for specified federally

threatened and endangered species and designated critical habitat that may occur in your proposed project area consistent with the South Carolina Ecological Services Field Office (ESFO) Determination Key (DKey) for project review and guidance for

federally listed species.

Thomas O'Neal:

The U.S. Fish and Wildlife Service (Service) received on **December 04, 2023** your effect determination(s) for the 'Blueline Project #2197 E Bowers RD' (the Action) using the South Carolina ESFO DKey for project review and guidance for federally-listed species within the Information for Planning and Consultation (IPaC) application. The Service developed this application in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Based on your answers and the assistance of the Service's South Carolina ESFO DKey, you made the following effect determination(s) for the proposed Action:

Species	Listing Status	Determination
Bunched Arrowhead (Sagittaria fasciculata)	Endangered	NLAA
Dwarf-flowered Heartleaf (Hexastylis naniflora)	Threatened	No effect

<u>Consultation with the Service is not complete.</u> The above effect determination(s) becomes applicable when the lead federal action agency or designated non-federal representative submits a request to the Service to rely on the South Carolina ESFO DKey in order to satisfy the agency's consultation requirements for this project.

Please provide this consistency letter to the lead Federal action agency or its designated non-federal representative with a request for its review, and as the agency deems appropriate, to submit for concurrence verification through the IPaC system. The lead Federal action agency or

designated non-federal representative should log into IPaC using their agency email account and click "Search by record locator." They will need to enter the record locator **895-135318937**

The following species and/or critical habitats may also occur in your project area and **are not** covered by this conclusion:

- Bog Turtle *Glyptemys muhlenbergii* Similarity of Appearance (Threatened)
- Monarch Butterfly *Danaus plexippus* Candidate
- Mountain Sweet Pitcher-plant *Sarracenia rubra ssp. jonesii* Endangered
- Rock Gnome Lichen Gymnoderma lineare Endangered
- Small Whorled Pogonia *Isotria medeoloides* Threatened
- Swamp Pink Helonias bullata Threatened
- Tricolored Bat Perimyotis subflavus Proposed Endangered
- White Fringeless Orchid *Platanthera integrilabia* Threatened

Please note that due to obligations under the ESA, potential impacts of this project must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action. If any of the above conditions occurs, additional consultation with the South Carolina ESFO should take place before project changes are final or resources committed.

Bald and Golden Eagle Protection Act (BGEPA): Bald and golden eagles are not included in this section 7(a)(2) consultation and this information does not constitute a determination of effects by the Service. The Service developed the <u>National Bald Eagle Management Guidelines</u> to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the BGEPA may apply to their activities. The guidelines should be consulted prior to conducting new or intermittent activity near an eagle nest.

If the Federal Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) may be required. Please contact Ulgonda Kirkpatrick (phone: 321/972-9089, e-mail: ulgonda_kirkpatrick@fws.gov) with any questions regarding potential impacts to bald or golden eagles.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Blueline Project #2197 E Bowers RD

2. Description

The following description was provided for the project 'Blueline Project #2197 E Bowers RD':

This is a 50.9 acre residential development project located south of East Bowers Road and west of Coleman Rd in Travelers Rest, SC. The project will involve land clearing, grading, and the construction of roads, utility lines, and residential buildings. The timing is unknown.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.98960024999995,-82.42905489361333,14z



QUALIFICATION INTERVIEW

1. Does the proposed project involve research or other actions that include the collection, capture, handling, or harassment of any individual federally listed threatened, endangered or proposed species?

No

2. Is the action authorized, funded, or being carried out by a Federal agency?

Yes

3. Are you the Federal agency or designated non-federal representative?

No

4. Is the project an existing structure that requires maintenance, repair, or replacement? *No*

5. Does the project intersect the Bunched arrowhead AOI?

Automatically answered

Yes

6. Is there suitable bunched arrowhead habitat (e.g., undisturbed sites typically located just below the origin of slow, clean, continuous seeps on gently sloping terrain) for Bunched arrowhead located within the project area?

Yes

7. Will the project impact suitable Bunched arrowhead habitat (e.g., upslope disturbance [bulldozer], change in water quality)?

No

8. Does the project intersect the Dwarf-flowered heartleaf AOI?

Automatically answered

Yes

9. Is there suitable habitat (e.g., acidic soils along bluffs and adjacent slopes, in boggy areas next to streams and creek heads, and along the slopes of nearby hillsides and ravines) for Dwarf-flowered heartleaf located within the project area?

No

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Thomas O'Neal

Address: 710 Lowndes Hill Road

City: Greenville

State: SC Zip: 29607

Email thomas@enviropermit.com

Phone: 8036033479



From: Van Culbertson < van@bluewatercivil.com >

Sent: November 14, 2023 9:51 AM

To: Toni Lewis <tlewis@metroconnects.org>

Cc: Paul Harrison compaul@bluewatercivil.com; Chrissy Drake <cdrake@bluewatercivil.com</pre>

Subject: PSSAR Package Request - E. Bowers Road Tract

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Toni,

Please see the attached PSSAR request for a project at the corner of E. Bowers Road and Coleman Road. It is noted that this site is in the "Annexation Area." If you have any questions or comments, please let me know.

Thanks, Van

--

Van Culbertson

Bluewater Civil Design, LLC 5 Century Drive - Suite 230 Greenville, SC 29607

Mailing Address: 718 Lowndes Hill Road Greenville, SC 29607 Cell: 864-684-9403

Office: 864-326-4202 Email: van@bluewatercivil.com
Please visit our website at: www.bluewatercivil.com

NOTICE: This message is directed to and is for the use of the above-noted addressee only, and its contents may be legally privileged or confidential. If the reader of this message is not the intended recipient, you are hereby notified that any distribution, dissemination, or copy of this message is strictly prohibited. If you have received this message in error, please delete it immediately and notify the sender. This message is not intended to be an electronic signature nor to constitute an agreement of any kind under applicable law unless otherwise expressly indicated hereon.

Bluewater Civil Design, LLC has Professionals Licensed in SC, NC, GA, AL, TN, FL, KY, OH, MD, ID, MT, WA, LA, VA



Scott Gillespie Deep River South Development, LLC 702 E. Washington St. Greenville, SC 29601

Email: scott@deepriversouth.com

Phone: (216) 543-1676

Reference: E Bowers Road - JWD

Deep River South Development, LLC Greenville County, South Carolina

Broad River Basin, Upper Enoree River, HUC: 0305010801

Blueline Project No.: 2197

Blueline Environmental Consultants, LLC delineated the waters on the E Bowers Road property in Travelers Rest, South Carolina. The project area occupies 50.99 +/- acres along E Bowers Road and Coleman Road and spans two Greenville County Tax Parcels: 0503030103100 and a portion of 0503030103000. The location of the approximate project area center in Lat/Long is 34.989113 °N, -82.428825°E, and the property address is 132 E Bowers Road, Travelers Rest, SC 29690. Blueline personnel visited the project area on September 1, 2023 to perform the delineation. The wetland delineation was performed in accordance with the Regional Supplement to the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual: Eastern Mountains and Piedmont (April 2012) and Rapanos guidance.

<u>Site Description:</u> The project area is made up of forested uplands, managed fields, four non-wetlands waters (tributaries), and two forested wetlands.

Remote Sensing Data: The USDA NRCS soils map depicts the following soil types within the project area:

Cb: Cartecay and Toccoa soils

CdB2: Cataula sandy loam, 2 to 6 percent slopes, moderately eroded

HIB2: Hiwassee clay loam, 2 to 6 percent slopes, eroded HID2: Hiwassee clay loam, 6 to 15 percent slopes, eroded

Wd: Wehadkee soils

National Wetland Inventory (NWI) maps indicate seven aquatic features within the project area. There is a riverine, lower perennial, unconsolidated bottom, permanently flooded, excavated (R2UBHx) feature that flows east along the southern project area boundary into a riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH) feature. There is also is a riverine, intermittent, streambed, seasonally flooded (R4SBC) located along the eastern project area boundary, which flows south into the R2UBH feature. There is one large palustrine, forested, broad-leaf deciduous, temporary flooded (PFO1A) located within the southern and eastern portions of the project area, with a palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded (PSS1C) feature located in the center of the PFO1A feature. There is another PSS1C feature located south of the R2UBX feature and another PFO1A feature



located east of the R4SBC feature. USGS topographic maps indicates one blueline tributary labeled as the "Enoree River" flowing east along the southern project area boundary. Another blueline is also indicated flowing south just outside of the eastern project area boundary.

<u>Jurisdictional Waters</u>.: Waters in the form of four non-wetlands waters (tributaries), and two forested wetlands were identified within the project area.

Non-Wetlands Waters 1 – Non-Wetlands Waters 1 is a 0.04-acre and 311.4 LF tributary located along the eastern project area boundary. The tributary has bed and bank features with an average bank width of 10 feet and average water depth of 6 inches. The substrate is composed of silt, sand, and gravel. The water flows clear and the following OHWM indicators were observed in Non-Wetlands Waters 1: clear natural line impressed on bank, changes in the character of soil, vegetation bent or absent, shelving, leaf litter washed away, sediment deposition, water staining, presence of litter and debris, sediment sorting, and scour as noted in Photo Points 1-5. Non-Wetlands Waters 1 emerges off property and receives water from overland storm flow from surrounding uplands. Non-Wetlands Waters 1 flows southeast and off property for 0.36 miles before flowing into off-property waters of Non-Wetlands Waters 6 (Enoree River).

Wetland 2 – Wetland 2 is a 0.91-acre forested wetland located in the river-right floodplain of Non-Wetlands Waters 1 in the northeastern portion of the project area. Saturation, water-stained leaves, drainage patterns, crayfish burrows, geomorphic position, hydrophytic vegetation, and hydric soils were observed as noted in Data Point 1 and Photo Points 9-17. Data Point 2 and Photo Points 21-25 document the swale below the wetland. Wetland 2 receives water from floodwaters of Non-Wetlands Waters 1 and overland storm flow from surrounding uplands. Wetland 2 is adjacent to Non-Wetlands Waters 1 and drains east towards Non-Wetlands Waters 1.

Non-Wetlands Waters 3 – Non-Wetlands Waters 3 is a 0.07-acre and 473.1 LF tributary located in the southeastern corner of the project area. The tributary has bed and bank features with an average bank width of 10 feet and average water depth of 2 inches. The substrate is composed of muck, sand, and silt. The water flows clear and the following OHWM indicators were observed in Non-Wetlands Waters 3: clear natural line impressed on bank, changes in the character of soil, vegetation absent, leaf litter disturbed or washed away, water staining, sediment sorting, and scour as noted in Photo Points 32-37. Non-Wetlands Waters 3 is likely a historic channel of Non-Wetlands Waters 1 and emerges from a headcut at the base of a berm below Non-Wetlands Waters 1. Non- Wetlands Waters 3 receives waters from floodwaters of Non-Wetlands Waters 6 (Enoree River) and overland storm flow from surrounding uplands. Non-Wetlands Waters 3 flows south and into Non-Wetlands Waters 6 (Enoree River).

Wetland 4 – Wetland 4 is a 9.54-acre forested wetland located in the northwestern and southern portions of the project area. Surface water, a high-water table, saturation, sediment deposits, water-stained leaves, aquatic fauna, hydrogen sulfide odor, oxidized rhizospheres on living roots, true aquatic plants, drainage patterns, geomorphic position, stunted or stressed



plants, a passing FAC-neutral test, hydrophytic vegetation, and hydric soils were observed as noted in Data Point 4 and Photo Points 39-41, 47-51, and 58-69. Data Point 3 and Photo Points 42-46 document the surrounding hillslope. Wetland 4 is a seepage wetland and receives water from a springhead, floodwaters of Non-Wetlands Waters 5, floodwaters from Non-Wetlands Waters 6 (Enoree River) during major flooding events, and overland storm flow from surrounding uplands. Wetland 4 abuts and drains south into to Non-Wetlands Waters 5 and Non-Wetlands Waters 6 (Enoree River).

Non-Wetlands Waters 5 – Non-Wetlands Waters 5 is a 0.02-acre and 519.4 LF tributary located in the southwestern portion of the project area within Wetland 4. The tributary has bed and bank features with an average bank width of 2 feet and an average water depth of 2 inches. The substrate is composed of muck, silt, and sand. The water flows clear and the following OHWM indicators were observed in Non-Wetlands Waters 5: clear natural line impressed on bank, changes in the character of soil, vegetation matted down or absent, and an abrupt change in plant community as noted in Photo Points 52-57. Stream Form 1 and Photo Points 55-57 document the bottom of Non-Wetlands Waters 5, where the tributary loses bed and bank features and flows into Wetland 4. Non-Wetlands Waters 5 emerges from a headcut and receives waters from Wetland 4 and overland storm flow from surrounding uplands. Non-Wetlands Waters 5 flows south and into Wetland 4.

Non-Wetlands Waters 6 – Non-Wetlands Waters 6 is a 0.41-acre and 1,770.5 LF portion of the Enoree River located along the southern project area boundary. The tributary has bed and bank features with an average bank width of 20 feet and average water depth of 6 inches. The substrate is composed of sand, gravel, and cobble. The water flows clear and the following OHWM indicators were observed in Non-Wetlands Waters 6 (Enoree River): changes in the character of soil, vegetation absent, leaf litter washed away, sediment deposition, sediment sorting, presence of litter and debris, multiple observed flow events, and scour as noted in Photo Points 73-77. Non-Wetlands Waters 6 (Enoree River) emerges off property and receives water from overland storm flow from surrounding uplands, Non-Wetlands Waters 3, and Wetland 4. Non-Wetlands Waters 6 (Enoree River) flows southeast and off property for approximately 6.64 miles before being identified as a TNW (SC DHEC Navigable Waters).

A total of 10.99 acres and 3,074.4 LF of waters in the forms of four non-wetlands waters tributaries and two forested wetlands were identified within the project area. Table 1, following this letter, lists the features.



The following figures are provided:

- Location Map (Sheet 1)
- USGS topographic map (Sheet 2)
- Lidar/ Aerial with waters overlay (Sheet 3)
- Soil/NWI/Aerial Map (Sheet 4)
- Data and Photo Location/Aerial with waters overlay (Sheet 5)
- Waters flow path (Sheet 6)
- Site Photographs: 1-90
- USACE EMP Wetland Determination Data Forms v.2: DP1 DP4
- NC DWQ Stream Identification Form Version 4.11: SF1
- Antecedent Precipitation Tool Version 1.0 Figure
- Waters Survey for Deep River South Development, LLC, produced by 3D Land Surveying, Inc.

Please let me know if you have any questions about this report. You can reach me at 803-603-3479 (or Laura Belanger at 828-553-9548) or by email at thomas.oneal@bluelineenviro.com.

Sincerely,

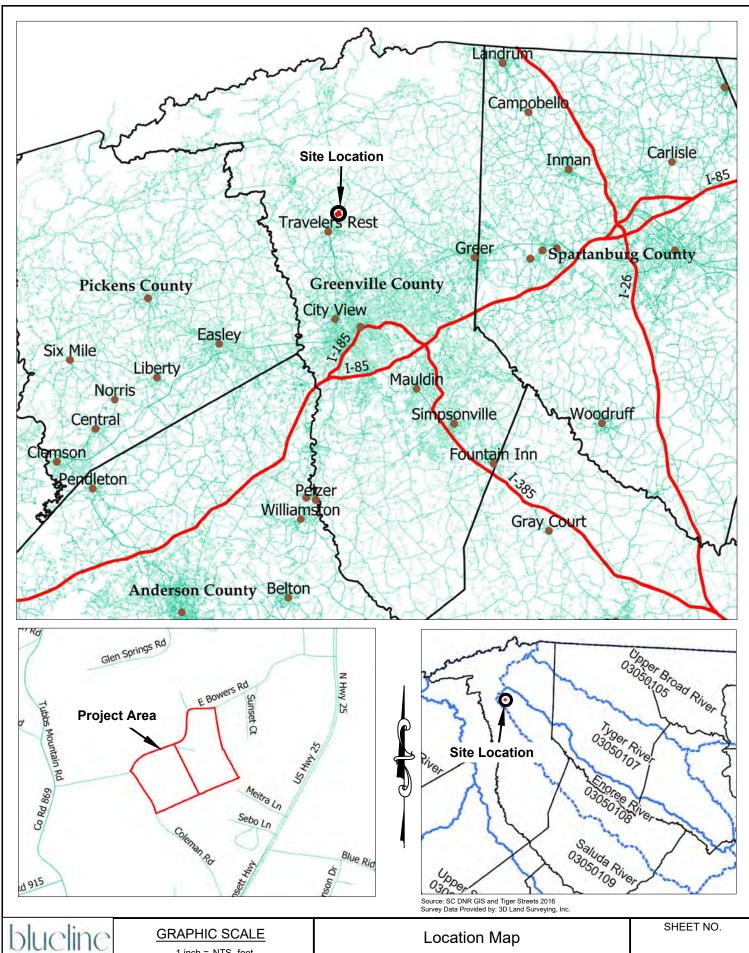
Thomas O'Neal

Thomas Oneal



Table 1: Features Blueline Project #2197 E Bowers Rd

Aquatic Resource	Area (acres)	Length (I.f.)	Connection to Other Features	Lat. /Long. Of Approx. Feature Center
Non-Wetlands Waters 1	0.04	311.4	Non-Wetlands Waters 1 emerges off property and receives water from overland storm flow from surrounding uplands. Non-Wetlands Waters 1 flows southeast and off property for 0.36 miles before flowing into off-property waters of Non-Wetlands Waters 6 (Enoree River).	34.990918° N -82.426815° E
Wetland 2	0.91	N/A	Wetland 2 receives water from floodwaters of Non- Wetlands Waters 1 and overland storm flow from surrounding uplands. Wetland 2 is adjacent to Non- Wetlands Waters 1 and drains east towards Non- Wetlands Waters 1.	34.991367° N -82.427287° E
Non-Wetlands Waters 3	0.07	473.1	Non-Wetlands Waters 3 is likely a historic channel of Non-Wetlands Waters 1 and emerges from a headcut at the base of a berm below Non-Wetlands Waters 1. Non- Wetlands Waters 3 receives waters from floodwaters of Non-Wetlands Waters 6 (Enoree River) and overland storm flow from surrounding uplands. Non-Wetlands Waters 3 flows south and into Non-Wetlands Waters 6 (Enoree River).	34.989198° N -82.425915° E
Wetland 4	9.54	N/A	Wetland 4 is a seepage wetland and receives water from a springhead, floodwaters of Non-Wetlands Waters 5, floodwaters from Non-Wetlands Waters 6 (Enoree River) during major flooding events, and overland storm flow from surrounding uplands. Wetland 4 abuts and drains south into to Non-Wetlands Waters 5 and Non-Wetlands Waters 6 (Enoree River).	34.987922° N -82.429169° E
Non-Wetlands Waters 5	0.02	519.4	Non-Wetlands Waters 5 emerges from a headcut and receives waters from Wetland 4 and overland storm flow from surrounding uplands. Non- Wetlands Waters 5 flows south and into Wetland 4.	34.988148° N -82.430619° E
Non-Wetlands Waters 6 (Enoree River)	0.41	1,770.5	Non-Wetlands Waters 6 (Enoree River) emerges off property and receives water from overland storm flow from surrounding uplands, Non-Wetlands Waters 3, and Wetland 4. Non-Wetlands Waters 6 (Enoree River) flows southeast and off property for approximately 6.64 miles before being identified as a TNW (SC DHEC Navigable Waters).	34.987719° N -82.427980° E

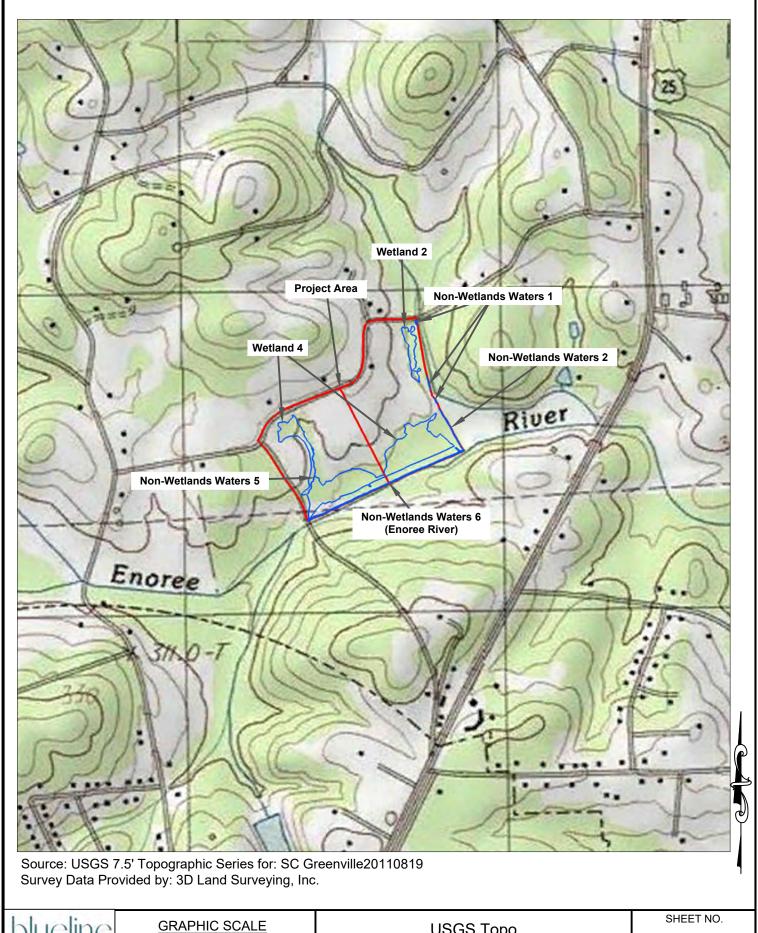




1 inch = NTS feet

DRAWN BY: то 710 Lowndes Hill Rd Greenville, SC 29607 DATE Greenville, SC 29607 Thoms O'Neal, PM Phone: (803)603-3479 20231214 BLUELINE PROJECT NO.:

East Bowers Road - JWD Deep River South Development, LLC Greenville County, South Carolina



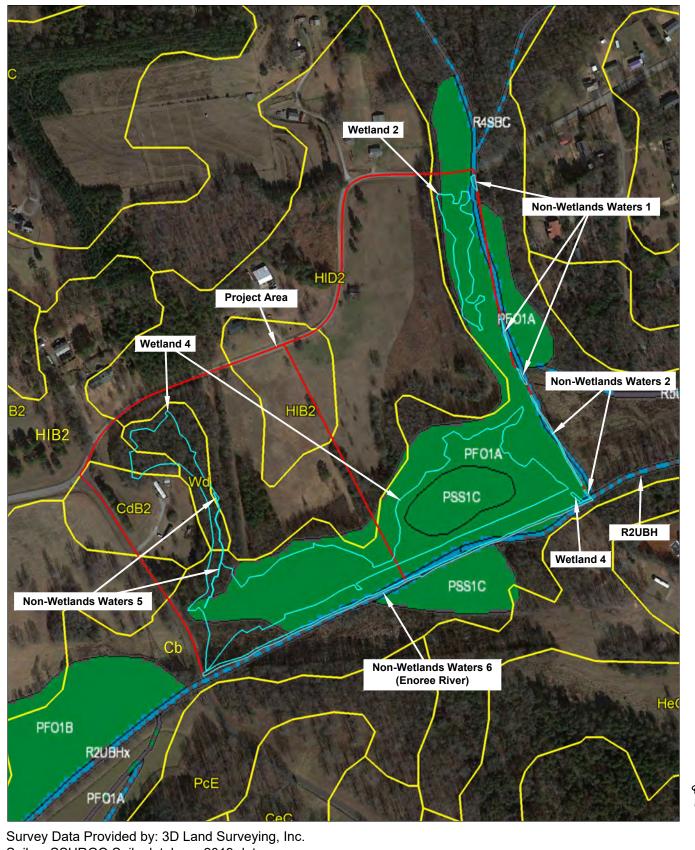


1 inch = 1000 feet

DRAWN BY: то 710 Lowndes Hill Rd Greenville, SC 29607 Thoms O'Neal, PM Phone: (803)603-3479 DATE: 20231214 BLUELINE PROJECT NO.:

USGS Topo

East Bowers Road - JWD Deep River South Development, LLC Greenville County, South Carolina



Soils: gSSURGO Soils database 2019 data

National Wetland Inventory (NWI): Last updated on June 13, 2023

Aerial Imagery: Google Earth 2021



GRAPHIC SCALE

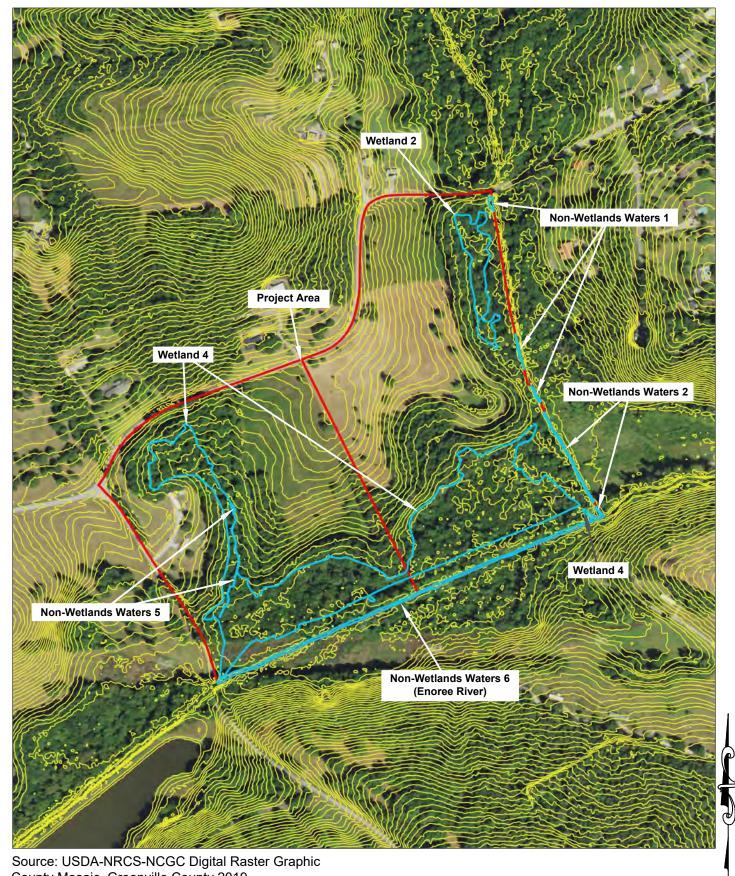
1 inch = 400 feet

DRAWN BY: то 710 Lowndes Hill Rd Greenville, SC 29607 Thoms O'Neal, PM Phone: (803)603-3479 DATE: 20231214 BLUELINE PROJECT NO.:

Soil/NWI

East Bowers Road - JWD Deep River South Development, LLC Greenville County, South Carolina

SHEET NO.



County Mosaic_Greenville County 2019

Survey Data Provided by: 3D Land Surveying, Inc.



GRAPHIC SCALE

1 inch = 400 feet

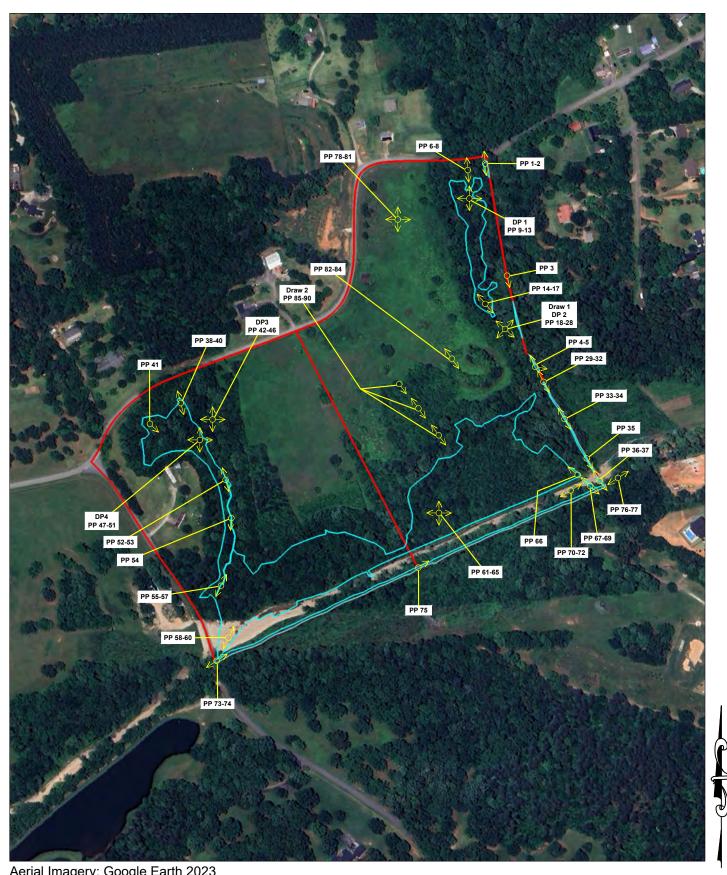
Greenville, SC 29607 Thoms O'Neal, PM	DRAWN BY:	TO
	DATE:	2023121
	BLUELINE PROJECT N	IO.: 219

Lidar 2-foot Contour

East Bowers Road - JWD
Deep River South Development, LLC
Greenville County, South Carolina

SHEET NO.

4



Aerial Imagery: Google Earth 2023 Survey Data Provided by: 3D Land Surveying, Inc.



GRAPHIC SCALE

1 inch = 400 feet

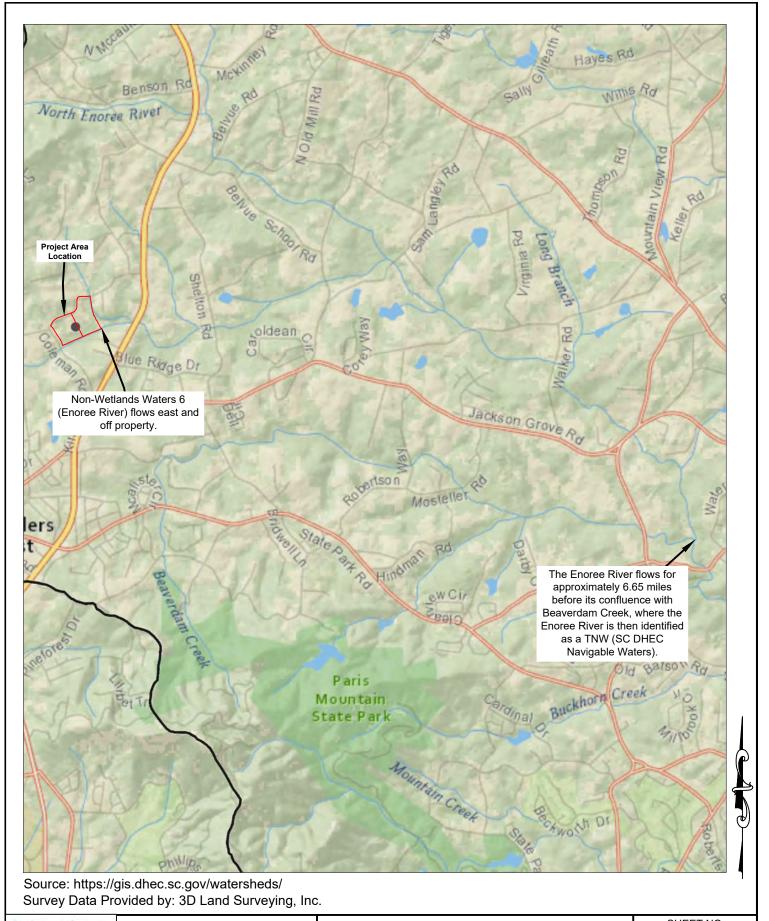
DRAWN BY: то 710 Lowndes Hill Rd Greenville, SC 29607 Thoms O'Neal, PM Phone: (803)603-3479 DATE: 20231214 BLUELINE PROJECT NO.:

Data and Photo Point Locations

East Bowers Road - JWD Deep River South Development, LLC Greenville County, South Carolina

SHEET NO.

5





GRAPHIC SCALE

1 inch = 4000 feet

710 Lowndes Hill Rd Greenville, SC 29607 Thoms O'Neal, PM Phone: (803)603-3479	DRAWN BY:	1	ГС
	DATE:	202312	14
	BLUELINE PROJECT N	10.: 21	97

Waters Path

East Bowers Road - JWD

Deep River South Development, LLC

Greenville County, South Carolina

SHEET NO.

6



Photo 1 Non-Wetlands Waters 1 top; looking upstream.



Photo 2 Non-Wetlands Waters 1 top; looking downstream.



Photo 3 Non-Wetlands Waters 1 middle; looking downstream.



Photo 4 Non-Wetlands Waters 1 bottom; looking upstream.



Photo 5 Non-Wetlands Waters 1 bottom; looking downstream and off property.



Photo 6 River-right terrace of Non-Wetlands Waters 1 above Wetland 2; looking north.



Photo 7 River-right terrace of Non-Wetlands Waters 1 above Wetland 2; looking south.



Photo 8 River-right terrace of Non-Wetlands Waters 1 above Wetland 2; soils.



Photo 9 DP1 (Wetland 2); looking north.



Photo 10 DP1 (Wetland 2); looking east.



Photo 11 DP1 (Wetland 2); looking south.



Photo 12 DP1 (Wetland 2); looking west.



Photo 13 DP1 (Wetland 2); soils.



Photo 14 Wetland 2 near bottom; looking upslope.



Photo 15 Wetland 2 near bottom; looking downslope.



Photo 16 Wetland 2 near bottom; soils (first auger pull).



Photo 17 Wetland 2 near bottom; soils (second auger pull).



Photo 18 Draw 1 top below Wetland 2; looking upslope.



Photo 19 Draw 1 top below Wetland 2; looking downslope.



Photo 20 Draw 1 top below Wetland 2; soils.



Photo 21 DP2 (Draw 1 middle); looking upslope.



Photo 22 DP2 (Draw 1 middle); looking valley-left.



Photo 23 DP2 (Draw 1 middle); looking downslope.



Photo 24 DP2 (Draw 1 middle) looking valley-right.



Photo 25 DP2 (Draw 1 middle); soils.



Photo 26 Draw 1 bottom; looking upslope.



Photo 27 Draw 1 bottom; looking downslope.



Photo 28 Draw 1 bottom; soils.



Photo 29 Berm between Non-Wetlands Waters 1 and Non-Wetlands Waters 3; looking north.



Photo 30 Berm between Non-Wetlands Waters 1 and Non-Wetlands Waters 3; looking south.



Photo 31 Berm between Non-Wetlands Waters 1 and Non-Wetlands Waters 3; soils.



Photo 32 Non-Wetlands Waters 3 top; looking downstream.



Photo 33 Non-Wetlands Waters 3 middle; looking upstream.



Photo 34 Non-Wetlands Waters 3 middle; looking downstream.



Photo 35 Non-Wetlands Waters 3 near bottom; looking downstream towards culvert.



Photo 36 Non-Wetlands Waters 3 bottom; looking upstream into culvert.



Photo 37 Non-Wetlands Waters 3 bottom; looking downstream into Non-Wetlands Waters 6 (Enoree River).



Photo 38 Wetland 4 top; looking upslope at headcut.



Photo 39 Wetland 4 top; looking downslope.



Photo 40 Wetland 4 top; soils.



Photo 41 Northwestern portion of Wetland 4 containing Sagittaria fasciculata, looking downslope.



Photo 42 DP3; looking north.

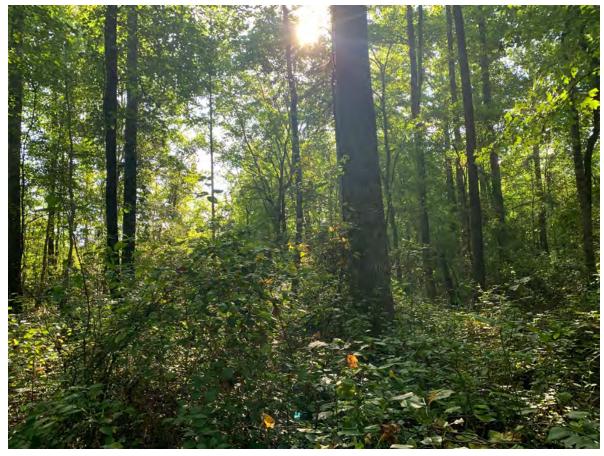


Photo 43 DP3; looking east.



Photo 44 DP3; looking south.



Photo 45 DP3; looking west.



Photo 46 DP3; soils.



Photo 47 DP4 (Wetland 4); looking north.



Photo 48 DP4 (Wetland 4); looking east.



Photo 49 DP4 (Wetland 4); looking south.



Photo 50 DP4 (Wetland 4); looking west.



Photo 51 DP4 (Wetland 4); soils.



Photo 52 Non-Wetlands Waters 5 top; looking upstream.



Photo 53 Non-Wetlands Waters 5 top; looking downstream.



Photo 54 Non-Wetlands Waters 5 middle; looking downstream.



Photo 55 Non-Wetlands Waters 5 bottom (SF1); looking upstream.



Photo 56 Non-Wetlands Waters 5 bottom (SF1); looking downstream towards Wetland 4.



Photo 57 Non-Wetlands Waters 5 bottom (SF1); soils.



Photo 58 Wetland 4 bottom in SSROW; looking upslope.



Photo 59 Wetland 4 bottom in SSROW; looking downslope towards Non-Wetlands Waters 6 (Enoree River).



Photo 60 Wetland 4 bottom in SSROW; soils.



Photo 61 Wetland 4 middle; looking north.



Photo 62 Wetland 4 middle; looking east.



Photo 63 Wetland 4 middle; looking south.



Photo 64 Wetland 4 middle; looking west.



Photo 65 Wetland 4 middle; soils.



Photo 66 Wetland 4 near bottom; looking upslope.



Photo 67 Wetland 4 bottom; looking upslope into culvert.



Photo 68 Wetland 4 bottom; looking downslope into Non-Wetlands Waters 6 (Enoree River).



Photo 69 Wetland 4 bottom; soils.



Photo 70 SSROW bottom; looking upslope.



Photo 71 SSROW bottom; looking downslope.



Photo 72 SSROW bottom; soils.



Photo 73 Non-Wetlands Waters 6 (Enoree River) top; looking upstream.



Photo 74 Non-Wetlands Waters 6 (Enoree River) top; looking downstream.



Photo 75 Non-Wetlands Waters 6 (Enoree River) middle; looking downstream.



Photo 76 Non-Wetlands Waters 6 (Enoree River) bottom; looking upstream.



Photo 77 Non-Wetlands Waters 6 (Enoree River) bottom; looking downstream.



Photo 78 Northern field; looking north.



Photo 79 Northern field; looking east.



Photo 80 Northern field; looking south.



Photo 81 Northern field; looking west



Photo 82 Bottom of northern field; looking upslope.



Photo 83 Bottom of northern field; looking downslope.



Photo 84 Bottom of northern field; soils.



Photo 85 Draw 2 top; looking downslope.



Photo 86 Draw 2 middle; looking downslope.



Photo 87 Draw 2 middle; soils.



Photo 88 Draw 2 bottom; looking upslope.



Photo 89 Draw 2 bottom; looking downslope.



Photo 90 Draw 2 bottom; soils.

Project/Site: Blueline Project #2187 E. Bowers Rd City/County: Travelers Rest / Greenville Sampling Date: 20230901
Applicant/Owner: Deep River South Development, LLC / SCott Gillespie State: SC Sampling Point: DP1
Investigator(s): ME Section, Township, Range:
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): slight concave Slope (%): 0-1
Subregion (LRR or MLRA): P, 136 Lat: 34.991824 Long: -82.427329 Datum: WGS 84
Soil Map Unit Name: Cb: Cartecay and Toccoa soils NWI classification: PF01A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
Are Vegetation Soil, or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes Vo
Are Vegetation, Soil, or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Is the Sampled Area
Hydric Soil Present? Yes Vo No within a Wetland? Yes No No
Wetland Hydrology Present? Yes Ves No No
Remarks:
DP1 located in Wetland 2, along river right-side floodplain of Non-Wetlands Waters 1.
HYDROLOGY
Wetland Hydrology Indicators: Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16)
☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5) ☐ Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3)
Water-Stained Leaves (B9) ☐ Microtopographic Relief (D4) ☐ A wastin Found (B43)
Aquatic Fauna (B13) FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes No _✓ Depth (inches): N/A
Water Table Present? Yes No Depth (inches): >19"
Saturation Present? Yes / No Depth (inches): >0" Wetland Hydrology Present? Yes / No No No No No No No No No N
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:
Antecedent Precipitation Tool Version 2.0 was used to determine whether climatological norms existed at the time of the site visit.
In the 90-days prior to the site visit, the rainfall antecedent to the site visit was above the range of normal. Based on this
data, we conclude that the antecedent moisture on the site qualifies as wetter than normal climatic hydrology conditions
for the wetland data form.

Sampling Po	oint: DP1
-------------	-----------

20 ft radius	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft radius) 1. Quercus nigra	% Cover 25	Species? Yes	Status FAC	Number of Dominant Species
2. Liriodendron tulipifera	20	Yes	FACU	That Are OBL, FACW, or FAC: 7 (A)
3. Acer rubrum	18	Yes	FAC	Total Number of Dominant
4. Liquidambar styraciflua	10	No	FAC	Species Across All Strata: 10 (B)
			170	Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 70% (A/B)
6	73	= Total Cov		Prevalence Index worksheet:
20.5				Total % Cover of: Multiply by:
50% of total cover: 36.5	20% of	total cover:	14.6	OBL species x 1 =
Sapling Stratum (Plot size: 15 ft radius	40	V	E40	FACW species x 2 =
1. Acer rubrum	<u>12</u> 5	Yes	FAC	FAC species x 3 =
2. Liquidambar styraciflua	4	Yes	FAC	FACU species x 4 =
3. Liriodendron tulipifera	2	No	FACU	UPL species x 5 =
4. Quercus nigra		No	FAC	Column Totals: (A) (B)
5				
6				Prevalence Index = B/A =
	23	= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover: <u>11.5</u>	20% of	total cover:	4.6	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 15 ft radius)				✓ 2 - Dominance Test is >50%
1. Ligustrum sinense	30	Yes	FACU	3 - Prevalence Index is ≤3.0 ¹
2				4 - Morphological Adaptations ¹ (Provide supporting
3				data in Remarks or on a separate sheet)
4				Problematic Hydrophytic Vegetation ¹ (Explain)
5				1
6				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	30	= Total Cov	er	Definitions of Five Vegetation Strata:
50% of total cover: 15	20% of	total cover	6	
Herb Stratum (Plot size: 5 ft radius	2070 01	total cover.		Tree – Woody plants, excluding woody vines,
1. Microstegium vimineum	20	Yes	FAC	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
2 Boehmeria cylindrica	15	Yes	FACW	
3. Smilax rotundifolia	5	No	FAC	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
4 Lonicera japonica	4	No	FACU	than 3 in. (7.6 cm) DBH.
5. Woodwardia areolata	4	No	FACW	Shrub – Woody plants, excluding woody vines,
6. Gelsemium sempervirens	3	No	FAC	approximately 3 to 20 ft (1 to 6 m) in height.
7. Vitis rotundifolia	2	No	FAC	Horb All bank account (non-viscolis) intents including
				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
8				plants, except woody vines, less than approximately 3
10				ft (1 m) in height.
				Woody vine – All woody vines, regardless of height.
11	53	= Total Cov		
20 5				
50% of total cover: 26.5	20% of	total cover:	10.6	
Woody Vine Stratum (Plot size: 30 ft radius	0	V	E40	
1. Vitis rotundifolia	3	Yes	FAC	
2. Smilax rotundifolia	2	Yes	FAC	
3. Toxicodendron radicans	1	No	FAC	
5. Textocacitateri fadicario	<u> </u>			
4				
·				Hydrophytic
·		= Total Cov	er	Hydrophytic Vegetation
·	6			
4 5	6 :			Vegetation

Profile Desc	Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth	Matrix		Redox	x Features	S			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-3	2.5Y 4/1	83	7.5YR 5/6	10	С	M	L	Saturated / Orcs
			7.5YR 4/4	7	С	PL		
3-5	7.5YR 4/2	85	7.5YR 4/4	15	С	M/PL	L	Saturated / Orcs
5-8	7.5YR 4/2	90	7.5YR 5/6	10	С	M		
8-15	7.5YR 4/2	75	5YR 5/6	25	С	M	SiCIL	Saturated
15-20	7.5YR 4/2	70	7.5YR 5/6	15	С	M	SiCIL	Saturated
			7.5YR 4/6	15	С	M		
20-24	10YR 4/1	83	7.5YR 5/6	7	С	M	SaCIL	Saturated
			5YR 5/8	10	С	M		
Hydric Soil Histosol Histic Ep Black Hi Hydroge Stratified 2 cm Mu Depletee Thick Da Sandy M MLRA Sandy F Stripped	Indicators: (A1) pipedon (A2) istic (A3) en Sulfide (A4) d Layers (A5) uck (A10) (LRR N) d Below Dark Surface ark Surface (A12) Mucky Mineral (S1) (LA 147, 148) Gleyed Matrix (S4) Redox (S5) I Matrix (S6) Layer (if observed):	e (A11) _ RR N ,	Beduced Matrix, MS Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleye Depleted Mat Redox Dark S Depleted Dar Redox Depre Iron-Mangane MLRA 136 Piedmont Flo Red Parent M	(S7) low Surface (S9) d Matrix (F3) Surface (F6) k Surface (F8) esse Masse b) ce (F13) (odplain S	(F12) (MLRA 13 oils (F19)	ains. ILRA 147, 148) LRR N, 66, 122) (MLRA 14	Indic 2 148)	L=Pore Lining, M=Matrix. ators for Problematic Hydric Soils³: cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16) (MLRA 147, 148) Piedmont Floodplain Soils (F19) (MLRA 136, 147) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) dicators of hydrophytic vegetation and etland hydrology must be present, lless disturbed or problematic. Description: Present? Yes No No

Project/Site: Blueline Project #2187 E. Bowers Rd City/County: Travelers Rest / Greenville Sampling Date: 20230901
Applicant/Owner: Deep River South Development, LLC / Scott Gillespie State: SC Sampling Point: DP2
Investigator(s): ME Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): slight concave Slope (%): 0-1
Subregion (LRR or MLRA): P, 136 Lat: 34.990325 Long: -82.426828 Datum: WGS 84
Soil Map Unit Name: Cb: Cartecay and Toccoa soils NWI classification: PF01A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
Are Vegetation, or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Is the Sampled Area
Hydrophytic Vegetation Present? Yes No Is the Sampled Area within a Wetland? Yes No V
Wetland Hydrology Present? Yes No V
Remarks:
DP2 located in middle of Draw 2, approximately 50 feet below Wetland 2 and approximately 50 feet from Non-Wetlands
Waters 1.
Ditch dissipates approximately 30 feet from Non-Wetlands Waters 1.
HYDROLOGY
Wetland Hydrology Indicators: Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) — Hydrogen Sulfide Odor (C1) — Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
□ Drift Deposits (B3) □ Thin Muck Surface (C7) ✓ Saturation Visible on Aerial Imagery (C9) □ Algal Mat or Crust (B4) □ Other (Explain in Remarks) □ Stunted or Stressed Plants (D1)
Iron Deposits (B5) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)
Water-Stained Leaves (B9) Microtopographic Relief (D4)
Aquatic Fauna (B13)
Field Observations:
Surface Water Present? Yes No Depth (inches): N/A
Water Table Present? Yes No Very Depth (inches): >24"
Saturation Present? Yes Very No Depth (inches): >11" Wetland Hydrology Present? Yes No Very No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:
Antecedent Precipitation Tool Version 2.0 was used to determine whether climatological norms existed at the time of the
site visit.
In the 90-days prior to the site visit, the rainfall antecedent to the site visit was above the range of normal. Based on this
data, we conclude that the antecedent moisture on the site qualifies as wetter than normal climatic hydrology conditions
for the wetland data form.

VEGETATION (Five Strata) – Use scientific names of plants.

/EGETATION (Five Strata) – Use scientific na	ımes of ı	plants.		Sampling Point: DP2
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 5ftx30ft radius)		Species?		Number of Dominant Species _
1. Acer negundo	30	Yes	FAC	That Are OBL, FACW, or FAC: 7 (A)
2. Liriodendron tulipifera	20	Yes	FACU	Total Number of Dominant
3. Liquidambar styraciflua	18	Yes	FAC	Species Across All Strata: 12 (B)
4. Acer rubrum	15	No	FAC	
5. Platanus occidentalis	7	No	FACW	Percent of Dominant Species That Are OBL, FACW, or FAC: 58.33% (A/B)
6				
	90	= Total Cov	er	Prevalence Index worksheet:
50% of total cover: 45				Total % Cover of: Multiply by:
Sapling Stratum (Plot size: 5ftx20ft radius)	20% 01	lotal cover.		OBL species x 1 =
1. Acer negundo	10	Yes	FAC	FACW species x 2 =
•	6	Yes	FACU	FAC species x 3 =
2. Ilex opaca	5			FACU species x 4 =
3. Liquidambar styraciflua	2	Yes	FACIL	UPL species x 5 =
4. Liriodendron tulipifera		No	FACU	Column Totals: (A) (B)
5	-		-	
6				Prevalence Index = B/A =
	23	= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover: 11.5	20% of	total cover:	4.6	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 5ftx20ft radius)		10101 52		✓ 2 - Dominance Test is >50%
1 Ligustrum sinense	30	Yes	FACU	3 - Prevalence Index is ≤3.0 ¹
·· <u>·</u>				4 - Morphological Adaptations ¹ (Provide supporting
2				data in Remarks or on a separate sheet)
3				Problematic Hydrophytic Vegetation ¹ (Explain)
4				
5				¹ Indicators of hydric soil and wetland hydrology must
6				be present, unless disturbed or problematic.
		= Total Cov	er	Definitions of Five Vegetation Strata:
50% of total cover:	20% of	total cover:		Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size: 5 ft radius				approximately 20 ft (6 m) or more in height and 3 in.
1. Rosa multiflora	6	Yes	FACU	(7.6 cm) or larger in diameter at breast height (DBH).
2. Smilax rotundifolia	5	Yes	FAC	Sapling – Woody plants, excluding woody vines,
3. Microstegium vimineum	4	Yes	FAC	approximately 20 ft (6 m) or more in height and less
4. Lonicera japonica	3	No	FACU	than 3 in. (7.6 cm) DBH.
5. Toxicodendron radicans	2	No	FAC	Shrub – Woody plants, excluding woody vines,
6 Polystichum acrostichoides	2	No	FACU	approximately 3 to 20 ft (1 to 6 m) in height.
7. Woodwardia areolata	1	No	FACW	
·	<u> </u>		IACVV	Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
8				plants, except woody vines, less than approximately 3
9				ft (1 m) in height.
10				Woody vine – All woody vines, regardless of height.
11				Woody Ville - All Woody Villes, regardless of freight.
	23	= Total Cov	er	
50% of total cover: 11.5	20% of	total cover:	4.6	
Woody Vine Stratum (Plot size: 5ftx30ft radius)				
1. Lonicera japonica	3	Yes	FACU	
2. Toxicodendron radicans	2	Yes	FAC	
			TAO	
3				
4				
5				Hydrophytic
	5	= Total Cov	er	Vegetation
		total cover:	1	Present? Yes <u>▼ No </u>
Remarks: (Include photo numbers here or on a separate si	neet.)			

SOIL

Profile Desc	ription: (Describe	to the dep	oth needed to docum	nent the	indicator	or confirn	n the absence	of indicators.)
Depth (inches)	Matrix Color (moist)	%	Color (moist)	x Feature %	es Type ¹	Loc ²	Texture	Remarks
0-3	5YR 3/3	100	Color (IIIolat)		_ i ypc		L	Organic material
3-7	5YR 4/3	85	5YR 4/2	10	D	M	SiL	
			5YR 4/6	5				
7-12	5YR 4/3	90	5YR 4/4	10	- C	M	SiL	
	_			8	- C			Saturated
12-16	5YR 4/4	92	5YR 5/6			<u>M</u>	SiCIL	
16-24	2.5Y 4/4	97	2.5Y 5/6	3	С	M	SiCIL	Saturated
					_		-	
¹ Type: C=Co	oncentration, D=De	pletion, RM	=Reduced Matrix, MS	S=Maske	d Sand G	ains.		L=Pore Lining, M=Matrix.
Hydric Soil I	Indicators:							ators for Problematic Hydric Soils ³ :
Histosol	• ,		Dark Surface					2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be				, 148)	Coast Prairie Redox (A16)
Black Hi			Thin Dark Su			147, 148)		(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye		(F2)		<u> </u>	Piedmont Floodplain Soils (F19)
	d Layers (A5) ick (A10) (LRR N)		Depleted Mat	. ,	TE6)		Π,	(MLRA 136, 147) /ery Shallow Dark Surface (TF12)
	d Below Dark Surfa	re (A11)	Depleted Dar	,	,			Other (Explain in Remarks)
	ark Surface (A12)	50 (7111)	Redox Depre				٠ .	Suiter (Explain in Nomarko)
_	lucky Mineral (S1) (LRR N.	☐ Iron-Mangane			LRR N.		
-	A 147, 148)	,	MLRA 136		,	,		
	Bleyed Matrix (S4)		Umbric Surfa	ce (F13)	(MLRA 1	36, 122)	³ Inc	dicators of hydrophytic vegetation and
☐ Sandy R	tedox (S5)		Piedmont Flo	odplain :	Soils (F19)	(MLRA 14	48) we	etland hydrology must be present,
	Matrix (S6)		Red Parent M	1aterial (F21) (MLF	A 127, 14	7) ur	lless disturbed or problematic.
Restrictive I	_ayer (if observed)):						
Type:								
Depth (inc	ches):						Hydric Soi	I Present? Yes No
Remarks:								
ı								
1								
1								
ı								
ı								

	unty: Travelers Rest / Greenville Sampling Date: 20230901
Applicant/Owner: Deep River South Development, LLC / Scott Gill	espie State: SC Sampling Point: DP3
Investigator(s): HS Section	, Township, Range:
Landform (hillslope, terrace, etc.): Floodplain Local relief	(concave, convex, none): none Slope (%): 0-2
Subregion (LRR or MLRA): P, 136 Lat: 34.989128	Long: -82.430870 Datum: WGS 84
Soil Map Unit Name: Wd: Wehadkee soils	NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes	
Are Vegetation Soil , or Hydrology significantly disturbe	ed? N Are "Normal Circumstances" present? Yes 📝 No 🔙
Are Vegetation, Soil, or Hydrology naturally problematic	c? N (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing samp	ling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	
' ' ' ' ' 	s the Sampled Area within a Wetland? Yes No
Wetland Hydrology Present? Yes ✓ No	
Remarks:	
DP3 taken upslope of Wetland 4.	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B1	
High Water Table (A2) Saturation (A3) Hydrogen Sulfide Odor Oxidized Rhizospheres	• • • • • • • • • • • • • • • • • • • •
Water Marks (B1) Presence of Reduced In	
Sediment Deposits (B2) Recent Iron Reduction	
☑ Drift Deposits (B3) ☐ Thin Muck Surface (C7)	` '
Algal Mat or Crust (B4)	<u> </u>
Iron Deposits (B5)	Geomorphic Position (D2)
☐ Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
✓ Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches): N/A	_
Water Table Present? Yes No Depth (inches): >24"	
Saturation Present? Yes No Depth (inches): >20"	Wetland Hydrology Present? Yes ✓ No No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous provides and provides are also provides as a second provides are a	ous inspections) if available:
Bosonibe (Cosonided Batta (Stream gauge, monitoring won, actial priotes, provide	add inspections), if dvalidate.
Remarks:	
Antecedent Precipitation Tool Version 2.0 was used to determine	ine whether climatological norms existed at the time of the
site visit.	The whether difficulting gradient and article of the
In the 90-days prior to the site visit, the rainfall antecedent to the	ne site visit was above the range of normal. Based on this
data, we conclude that the antecedent moisture on the site qua	alifies as wetter than normal climatic hydrology conditions
for the wetland data form.	

VEGETATION (Five Strata) – Use scientific names of plants.

/EGETATION (Five Strata) – Use scientific na	ames of _l	plants.		Sampling Point: DP3
00.6	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft radius)		Species?		Number of Dominant Species _
1. Liquidambar styraciflua	15	Yes	FAC	That Are OBL, FACW, or FAC: 7 (A)
2. Betula nigra	12	Yes	FACW	Total Number of Dominant
3. Quercus nigra	6	No	FAC	Species Across All Strata: 9 (B)
4. Thuja occidentalis	3	No	FACW	
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 77.78% (A/B)
6.				
	36	= Total Cov	er	Prevalence Index worksheet:
50% of total cover: 18				Total % Cover of: Multiply by:
	20% of	total cover:	1.2	OBL species x 1 =
Sapling Stratum (Plot size: 15 ft radius	O*	*	ГЛС	FACW species x 2 =
1. Liquidambar styraciflua 2 Quercus nigra*	<u>Z</u>	*	FAC FAC	FAC species x 3 =
2. <u>Questous inglu</u>	-		FAC	FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				(3)
6				Prevalence Index = B/A =
	3*	= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover:	20% of	total cover		1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 15 ft radius)	20 /6 01	total cover.		2 - Dominance Test is >50%
1 Viburnum dentatum	17	Yes	FAC	3 - Prevalence Index is ≤3.0¹
2 Ligustrum sinense	6	Yes	FACU	4 - Morphological Adaptations ¹ (Provide supporting
<u></u>				data in Remarks or on a separate sheet)
3				Problematic Hydrophytic Vegetation ¹ (Explain)
4				
5				¹ Indicators of hydric soil and wetland hydrology must
6				be present, unless disturbed or problematic.
	23	= Total Cov	er	Definitions of Five Vegetation Strata:
50% of total cover: 11.5	20% of	total cover:	4.6	
Herb Stratum (Plot size: 5 ft radius				Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
1. Smilax rotundifolia	8	Yes	FAC	(7.6 cm) or larger in diameter at breast height (DBH).
2. Rubus allegheniensis	7	Yes	FACU	O-reliant West and relationship discount and relationship
3. Carex pedunculata	5	Yes	OBL	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
4. Ligustrum sinense	3	No	FACU	than 3 in. (7.6 cm) DBH.
5 Parthenocissus quinquefolia	2	No	FACU	Charles Was developed a south discourse developed
-		110	17100	Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
6				
7				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
8				plants, except woody vines, less than approximately 3
9				ft (1 m) in height.
10				Woody vine – All woody vines, regardless of height.
11				Woody Ville - All Woody Villes, regardless of Height.
	25	= Total Cov	er	
50% of total cover: <u>12.5</u>	20% of	total cover:	5	
Woody Vine Stratum (Plot size: 30 ft radius)				
1. Smilax rotundifolia	9	Yes	FAC	
2. Toxicodendron radicans	3	Yes	FAC	
			1710	
3				
4				
5	11			Hydrophytic
	11	= Total Cov	er	Vegetation
50% of total cover: <u>5.5</u>	20% of	total cover:	2.2	Present? Yes V No No
Remarks: (Include photo numbers here or on a separate s	heet.)			1
*not used in dominance calculation	,			

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redox	x Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-2	5YR 4/4	93	5YR 5/6	7	С	M	SiL	
2-8	5YR 4/6	96	5YR 5/7	4	С	М	SiL	
8-15	5YR 4/4	89	5YR 4/3	8	С	М	SiCIL	
			5YR 5/6	3	С	M		
15-22	5YR 4/4	84	5YR 4/3	12	С	M	SiCIL	Saturated at 20"
			5YR 4/4	4	С	M		
22-24	5YR 4/4	82	5YR 4/3	18	С	М	CIL	Saturated
						·		
	-		-				-	
				-				
1Type: C=C	ncentration D=Den	letion RM	=Reduced Matrix, MS		d Sand Gr	aine	² Location: F	PL=Pore Lining, M=Matrix.
Hydric Soil		ielion, ixivi	-Neduced Matrix, Mc	-iviasket	a Sand Gi	allis.		cators for Problematic Hydric Soils ³ :
Histosol			Dark Surface	(87)			_	2 cm Muck (A10) (MLRA 147)
	oipedon (A2)		Polyvalue Be		oo (S9) /I	AI DA 147		Coast Prairie Redox (A16)
							, 140)	(MLRA 147, 148)
Black Hi			Thin Dark Su			147, 140)		•
	n Sulfide (A4)		Loamy Gleye		(F2)		ш '	Piedmont Floodplain Soils (F19)
	d Layers (A5)		Depleted Mat	. ,				(MLRA 136, 147)
	ick (A10) (LRR N)		Redox Dark S	,	,			Very Shallow Dark Surface (TF12)
	d Below Dark Surface	e (A11)	Depleted Dar					Other (Explain in Remarks)
	ark Surface (A12)		Redox Depre					
Sandy M	lucky Mineral (S1) (L	.RR N,	☐ Iron-Mangan	ese Mass	es (F12) (LRR N,		
MLRA	A 147, 148)		MLRA 130	6)				
☐ Sandy G	Sleyed Matrix (S4)		Umbric Surfa	ce (F13)	(MLRA 13	36, 122)	³ In	dicators of hydrophytic vegetation and
	Redox (S5)		Piedmont Flo					etland hydrology must be present,
-	Matrix (S6)		Red Parent M					nless disturbed or problematic.
	_ayer (if observed):				_ · / (···· _ ··		-, <u></u>	nece dictalized or programmation
Type:	zayer (ii observea).							
Depth (inc	ches):						Hydric So	il Present? Yes No V
Remarks:								

	ounty: Travelers Rest / Greenville Sampling Date: 20230901
Applicant/Owner: Deep River South Development, LLC / Scott G	illespie State: SC Sampling Point: DP4
Investigator(s): HS, TO Section	on, Township, Range:
Landform (hillslope, terrace, etc.): Swale Local reli	ef (concave, convex, none): Concave Slope (%): 3-4
Subregion (LRR or MLRA): P, 136 Lat: 34.989318	Long: -82.431029 Datum: WGS 84
Soil Map Unit Name: Wd: Wehadkee soils	NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? You	
Are Vegetation Soil , or Hydrology significantly disturb	
Are Vegetation , Soil , or Hydrology naturally problema	
SUMMARY OF FINDINGS – Attach site map showing sam	pling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area
Hydric Soil Present? Yes ✓ No	within a Wetland? Yes No
Wetland Hydrology Present? Yes ✓ No	
Remarks:	
DP4 taken at top of Wetland 4.	
·	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (I	
✓ High Water Table (A2) ✓ Hydrogen Sulfide Odd	
	es on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduced	
Sediment Deposits (B2) Recent Iron Reduction	
Drift Deposits (B3) Thin Muck Surface (C	
Algal Mat or Crust (B4) Other (Explain in Rem	narks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	✓ Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
✓ Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches): N/A	
Water Table Present? Yes No Depth (inches): _>8"	
Saturation Present? Yes V No V Depth (inches): >0"	Wetland Hydrology Present? Yes ✓ No ✓ No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	vious inspections), if available:
Booting Notice Plata (calcular gauge, memoring won, actual priotoc, pro	vious inspectatio), il available.
Remarks:	
Antecedent Precipitation Tool Version 2.0 was used to determ	mine whether climatological norms existed at the time of the
site visit.	Time whether climatological norms existed at the time of the
In the 90-days prior to the site visit, the rainfall antecedent to	the site visit was above the range of normal. Based on this
data, we conclude that the antecedent moisture on the site qu	
for the wetland data form.	, ,,

VEGETATION (Five Strata) – Use scientific names of plants.

/EGETATION (Five Strata) – Use scientific na	mes of _l	olants.		Sampling Point: DP4
00.5	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft radius)		Species?		Number of Dominant Species
1. Liquidambar styraciflua	12	Yes	FAC	That Are OBL, FACW, or FAC: 8 (A)
2. Nyssa sylvatica	8	Yes	FAC	Total Number of Dominant
3. Quercus phellos	4	No	FAC	Species Across All Strata: 11 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 72.73% (A/B)
6				
	24	= Total Cov	er	Prevalence Index worksheet:
50% of total cover: 12	20% of	total cover:	4.8	
Sapling Stratum (Plot size: 15 ft radius	<u></u>			OBL species x 1 =
1 Liquidambar styraciflua	8	Yes	FAC	FACW species x 2 =
2. Fraxinus americana	4	Yes	FACU	FAC species x 3 =
3. Ilex opaca	3	Yes	FACU	FACU species x 4 =
4				UPL species x 5 =
5				Column Totals: (A) (B)
6.	-			Prevalence Index = B/A =
o	15	= Total Cov	er	Hydrophytic Vegetation Indicators:
7.5				1 - Rapid Test for Hydrophytic Vegetation
50% of total cover: 7.5	20% of	total cover:	<u> </u>	✓ 2 - Dominance Test is >50%
Shrub Stratum (Plot size: 15 ft radius) 1. Viburnum nudum	12	Yes	OBL	3 - Prevalence Index is ≤3.0 ¹
	6	Yes	FACW	4 - Morphological Adaptations ¹ (Provide supporting
2. Ilex coriacea	4	No		data in Remarks or on a separate sheet)
3. Ligustrum sinense	<u> </u>		FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
4				
5				¹ Indicators of hydric soil and wetland hydrology must
6	00			be present, unless disturbed or problematic.
	22	= Total Cov	er	Definitions of Five Vegetation Strata:
50% of total cover: 11	20% of	total cover:	4.4	Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size: 5 ft radius)				approximately 20 ft (6 m) or more in height and 3 in.
1. Leersia virginica	23	Yes	FACW	(7.6 cm) or larger in diameter at breast height (DBH).
_{2.} Rubus flagellaris	12	Yes	FACU	Sapling – Woody plants, excluding woody vines,
3. Viburnum nudum	8	No	OBL	approximately 20 ft (6 m) or more in height and less
4. Linnaea borealis	6	No	FAC	than 3 in. (7.6 cm) DBH.
_{5.} Woodwardia areolata	6	No	FACW	Shrub – Woody plants, excluding woody vines,
6. Dichanthelium acuminatum	4	No	FAC	approximately 3 to 20 ft (1 to 6 m) in height.
7. Rhamnus alnifolia	2	No	OBL	Herb – All herbaceous (non-woody) plants, including
8				herbaceous vines, regardless of size, and woody
9				plants, except woody vines, less than approximately 3 ft (1 m) in height.
10				
11				Woody vine – All woody vines, regardless of height.
	61	= Total Cov	er	
50% of total cover: 30.5	20% of	total agyar:	12 2	
Woody Vine Stratum (Plot size: 30 ft radius)	20 /0 01	total cover.		
1. Smilax rotundifolia	12	Yes	FAC	
2. Smilax laurifolia	5	Yes	FACW	
3				
4				
5	17			Hydrophytic
		= Total Cov		Vegetation Present? Yes ✓ No
50% of total cover: 8.5	20% of	total cover:	3.4	rieseiit: Tes Tv NOTT
Remarks: (Include photo numbers here or on a separate s	heet.)			
*not used in dominance calculation				

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth	Matrix		Redox	x Feature	s						
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks			
0-3	10YR 5/2	88	10YR 5/6	12	С	M	SiL	Saturated / Organic material			
3-8	10YR 5/2	77	10YR 5/6	20	С	M/PL	SiL	Saturated/ Organic /Orcs			
			10YR 6/3	3	С	М					
8-14	10YR 5/2	79	10YR 5/7	15	С	M	SiL				
		-	10YR 4/4	6	С	М					
14-17	10YR 4/2	89	10YR 2/1	7	D	М	SaL				
			10YR 5/6	4	С	M					
17-24	10YR 4/1	86	10YR 2/1	8	D	M	SaL				
			10YR 3/2	6	D	M					
		. ——									
1							2				
		letion, RM	=Reduced Matrix, MS	S=Masked	d Sand Gr	ains.		L=Pore Lining, M=Matrix.			
Hydric Soil I							_	ators for Problematic Hydric Soils ³ :			
Histosol	` '		Dark Surface	. ,				cm Muck (A10) (MLRA 147)			
	pipedon (A2)		Polyvalue Be				148) <u> </u>	Coast Prairie Redox (A16)			
Black Hi	, ,		Thin Dark Su			147, 148)		(MLRA 147, 148)			
	n Sulfide (A4)		Loamy Gleye		(F2)		<u>Ш</u> Р	Piedmont Floodplain Soils (F19)			
Stratified	d Layers (A5)		Depleted Mat	rix (F3)				(MLRA 136, 147)			
2 cm Mu	ick (A10) (LRR N)		Redox Dark S	Surface (F	- 6)		_ ∨	ery Shallow Dark Surface (TF12)			
Depleted	d Below Dark Surfac	e (A11)	Depleted Dar	k Surface	e (F7)			Other (Explain in Remarks)			
☐ Thick Da	ark Surface (A12)		Redox Depre	ssions (F	8)						
Sandy M	lucky Mineral (S1) (I	RR N.	Iron-Mangane			LRR N.					
-	\ 147, 148)	,	MLRA 130		() (,					
	Gleyed Matrix (S4)		Umbric Surfa	•	(MIRA 13	86 122)	3Ind	licators of hydrophytic vegetation and			
	ledox (S5)		Piedmont Flo					etland hydrology must be present,			
-											
	Matrix (S6)		Red Parent N	riateriai (F	·21) (NILR	A 127, 147	r) un	less disturbed or problematic.			
	_ayer (if observed):										
Type:							Hydric Soil Present? Yes V				
Depth (inc	cnes):						Hydric Soil	Present? Yes V No V			
Remarks:											

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

Project/Site: 2197 E. Bowers Rd

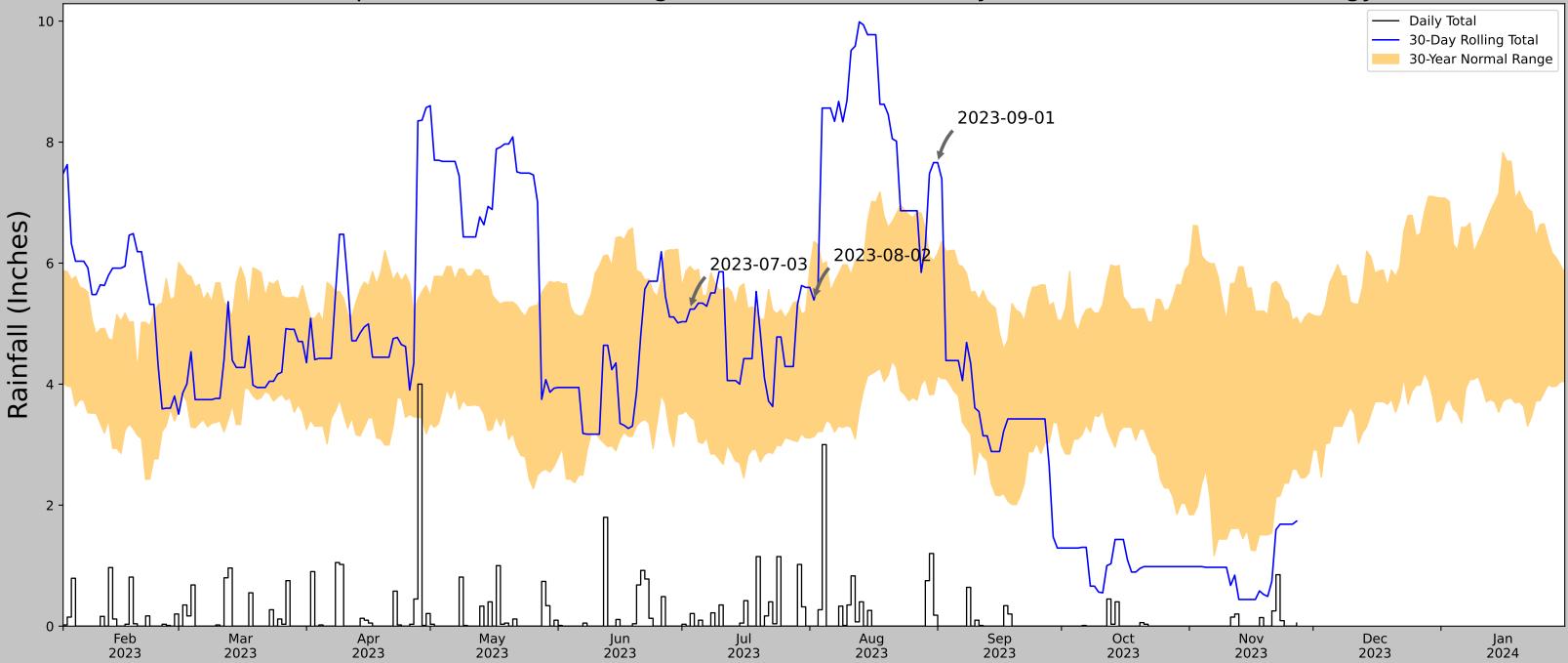
Latitude: 34.987472

NC DWQ Stream Identification Form Version 4.11

Date: 20230901

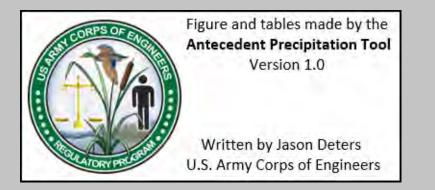
		L. Dowels Ita			
Evaluator: HS	County: Greenvil	le	Longitude: -82.430792		
Total Points: Stream is at least intermittent 16.75 if \geq 19 or perennial if \geq 30*	Stream Determina	ation (circle one) mittent ☐Perennial	Other e.g. Quad Name: SF1		
A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong	
1 ^{a.} Continuity of channel bed and bank	0 🗸	1	2	3	
2. Sinuosity of channel along thalweg	0	1 🗸	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0 🗸	1 🔲	2 🗆	3	
4. Particle size of stream substrate	0 🗸	1 🗆	2	3	
5. Active/relict floodplain	0 🗆	1 🗸	2	3 🗌	
6. Depositional bars or benches	0 🗸	1 🗌	2	3 🗌	
7. Recent alluvial deposits	0 🗆	1 🗸	2	3 🗌	
8. Headcuts	0 🗸	1 🔲	2	3 🗌	
9. Grade control	0 🗆	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No :	= 0	Yes =	3	
^a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 7)					
12. Presence of Baseflow	0 🗌	1 🔲	2	3	
13. Iron oxidizing bacteria	0 🗸	1 🗍	2 🗍	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0 🗸	0.5	1	1.5	
17. Soil-based evidence of high water table?	No -	= 0	Yes =	3 🗸	
C. Biology (Subtotal = 5.75	•				
18. Fibrous roots in streambed	3	2 🗸	1	0	
19. Rooted upland plants in streambed	3 🗸	2	1	0	
20. Macrobenthos (note diversity and abundance)	0 🗸	1	2	3	
21. Aquatic Mollusks	0 🗸	1	2	3	
22. Fish	0 🗸	0.5	1	1.5	
23. Crayfish	0 🗸	0.5	1 🔲	1.5	
24. Amphibians	0 🗸	0.5	1 🔲	1.5	
25. Algae	0 🗸	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBL	= 1.5 Other = 0	FACW X	
*perennial streams may also be identified using other method:	s. See p. 35 of manual.				
Notes:					
Sketch: SF1 taken at bottom of Non-Wetlan	nds Waters 5.				

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

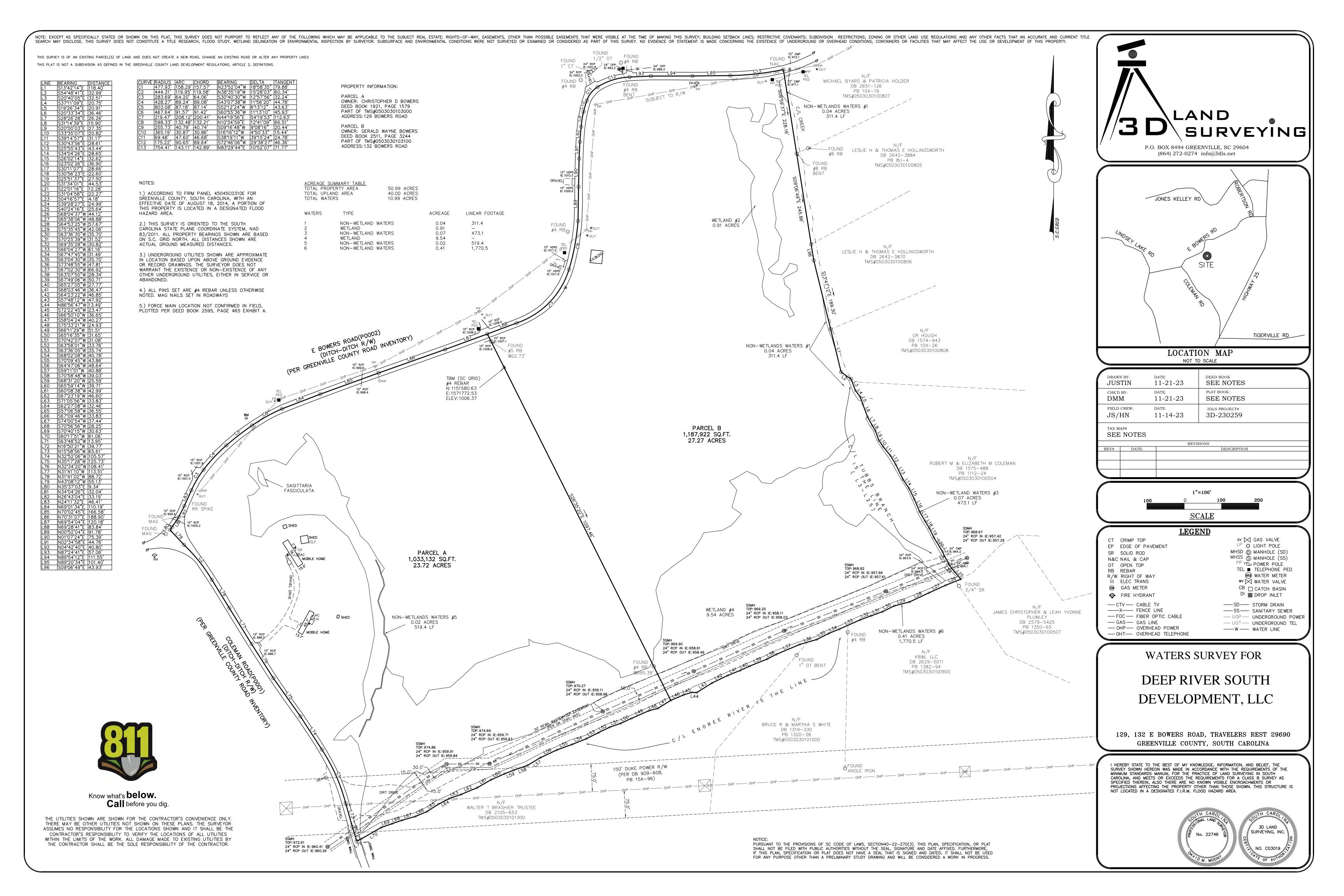


Coordinates	34.989128, -82.430870
Observation Date	2023-09-01
Elevation (ft)	985.028
Drought Index (PDSI)	Mild drought
WebWIMP H ₂ O Balance	Dry Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-01	4.137008	6.162992	7.661418	Wet	3	3	9
2023-08-02	3.131102	6.356693	5.389764	Normal	2	2	4
2023-07-03	3.459449	5.945276	5.240158	Normal	2	1	2
Result							Wetter than Normal - 15



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted ∆	Days Normal	Days Antecedent
TRAVELERS REST 2NE	34.9842, -82.3997	1049.869	1.797	64.841	0.925	10170	83
TRAVELERS REST 2.4 ESE	34.9594, -82.3973	1117.126	1.719	67.257	0.889	95	6
TAYLORS 6.1 NNW	34.9966, -82.3541	1013.123	2.72	36.746	1.324	31	1
TRAVELERS REST 2.0 SSW	34.9403, -82.4522	1066.929	4.247	17.06	1.984	30	0
TAYLORS 3.0 NNW	34.9518, -82.3433	979.003	3.9	70.866	2.031	10	0
TAYLORS 2.8 W	34.9189, -82.3621	1037.074	4.989	12.795	2.309	3	0
CLEVELAND 3S	35.0269, -82.5014	1134.843	6.468	84.974	3.46	985	0
GREENVILLE DWTN AP	34.8486, -82.35	1017.06	9.783	32.809	4.723	28	0
GREER	34.8833, -82.2197	1068.898	12.351	19.029	5.793	1	0





TECHNICAL MEMORANDUM

DATE: January 22, 2024

To: Scott Gillespie CC: Austin Evert

From: Michael Dennis, PE - Access Engineering

REFERENCE: VILLAS OF NORTH VALLEY TRIP GENERATION COMPARISON

A Traffic Impact Study (TIS) was completed for the Villas of North Valley development in January 2024. The study was completed for a development for 87 homes of an age restricted community. The study used the ITE Trip Generation Manual and the land use code (LUC 251) Senior Living Community, Senior Adult Housing. The LUC 251 is typically used for developments restricted to adults 55 and over. Senior Living Communities typically have 40-50% less trips than standard housing developments (LUC 210 – Single Family Detached Housing).

A comparison of the estimated trips for 87 units of each type of house (LUC 251 and LUC 210) is shown below in Table 1.

Table 1 Trip Generation - Senior Housing vs Single Family Housing									
Land Use	Development Size	Trip	A.M. Peak Hour			P.M. Peak Hour			24-Hour
2410 000		Rate/Day	Enter	Exit	Total	Enter	Exit	Total	2-way
Senior Adult Housing Single Family LUC 251	87 units	4.31	12	23	35	24	16	40	526
Single Family Detached Housing LUC 210	87 units	9.43	16	50	66	55	32	87	888

For the Villas of North Valley, the daily trip estimate (using LUC 251) is 40+% less versus than a standard single family home development (LUC 210). The AM Peak Hour total trips are approximately 42% less and the PM Peak Hour total trips are approximately 54% less.

If you have any questions regarding this letter, please feel free to email or call the number below.

Sincerely,

Access Engineering LLC

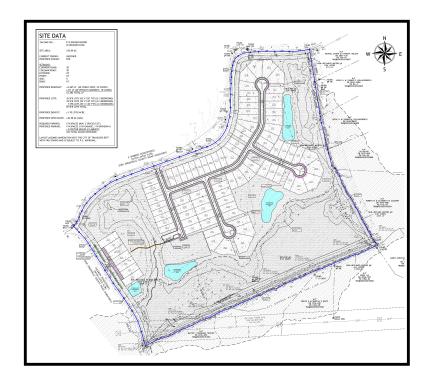
Michael A. Dennis, P.E. Senior Traffic Engineer

803-606-2834

mdennis@accesstrafficsc.com

TRAFFIC IMPACT STUDY

for the



The Villas of North Valley Senior Living Residential Community

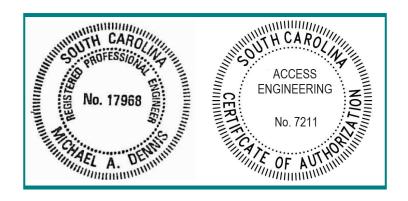
Located in Travelers Rest, South Carolina

Prepared for Deep River South Development 702 E. Washington St. Greenville, SC 29601

Prepared by Access Engineering LLC



Project #23005



EXECUTIVE SUMMARY

A traffic impact study was conducted for the proposed Villas of North Valley senior living residential community in accordance with Greenville County and SCDOT guidelines. The development is to be located south of East Bowers Road and east of Coleman Road in Travelers Rest, South Carolina. The development is planned to have 87 senior adult single-family homes. Seven (7) of the homes will access Coleman Road at one location, the remaining 80 homes will access at one location on East Bowers Road. The community will be limited to residents 55 years old and older.

The site accesses can function adequately with one ingress and one egress lane. Based on the 2026 anticipated build out volumes, auxiliary turn-lanes on East Bowers Road and Coleman Road are not warranted at the site accesses. The site accesses should be designed to provide proper sight distances and meet Greenville County design criteria.

With construction of the project, all the study intersections should continue to function adequately; no changes are recommended.



1. INTRODUCTION

This report will document a traffic impact study for the proposed Villas of North Valley senior living residential community in Travelers Rest, South Carolina in accordance with Greenville County and SCDOT guidelines. The community will be limited to residents 55 years old and older.

The development is to be located south of East Bowers Road and east of Coleman Road in Travelers Rest, South Carolina. The development is planned to have 87 single family homes. Seven (7) of the homes will access Coleman Road at one location, the remaining 80 homes will access at one location on East Bowers Road.

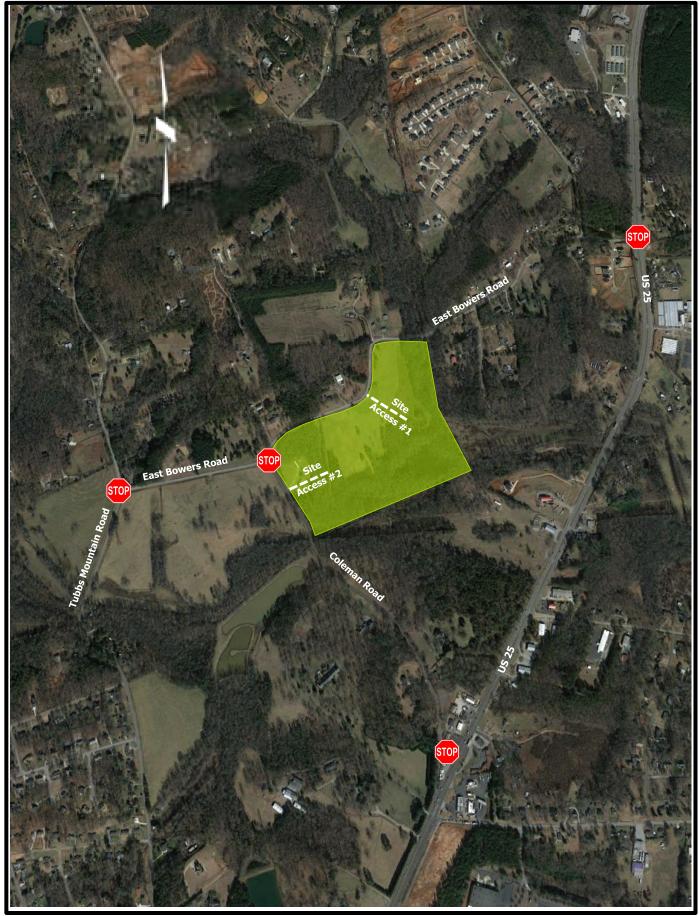
The traffic impact study considers the weekday AM peak period (between 7:00 AM and 9:00 AM) and the weekday PM peak period (between 4:00 PM and 6:00 PM) as the study time frames. The following intersections are studied:

- East Bowers Road & Coleman Road
- East Bowers Road & Tubbs Mountain Road (S-23-869)
- East Bowers Road & US-25
- East Bowers Road & Site Access #1
- Coleman Road & Site Access #2

Future-year analyses assume 2026 conditions as the Build scenario. Scoping correspondence is included in *Appendix A*.

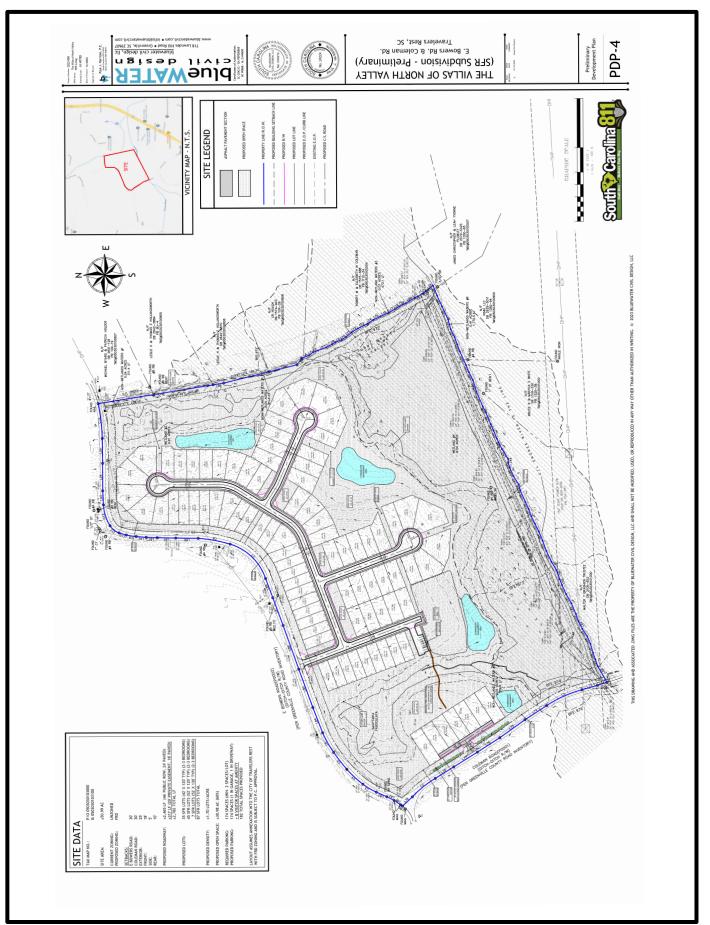
The site location is shown in *Figure 1* and the conceptual site plan is shown in *Figure 2*.







Villas of North Valley Senior Living Community - Traffic Impact Study Figure 1 - Project Location Map





2. EXISTING CONDITIONS

Roadway Inventory

The existing roadway conditions are summarized in *Table 1. Figure 3* illustrates the existing lane geometry.

Table 1 – Roadway Inventory

Facility	Route #	Typical Cross Section	Posted Speed Limit	Maintained By	2022 AADT
N 25 Highway	US 25	4-lane divided	55 MPH	SCDOT	26,000 ¹
East Bowers Road		2-lane undivided	30 MPH	Local	N/A
Coleman Road		2-lane undivided	NP	Local	N/A
Tubbs Mountain Road	S-23-869	2-lane undivided	30 MPH	Local	1,650 ²

¹⁻SCDOT Count Station 23-0115, 2-SCDOT Count Station 23-0381

Current Traffic Volumes

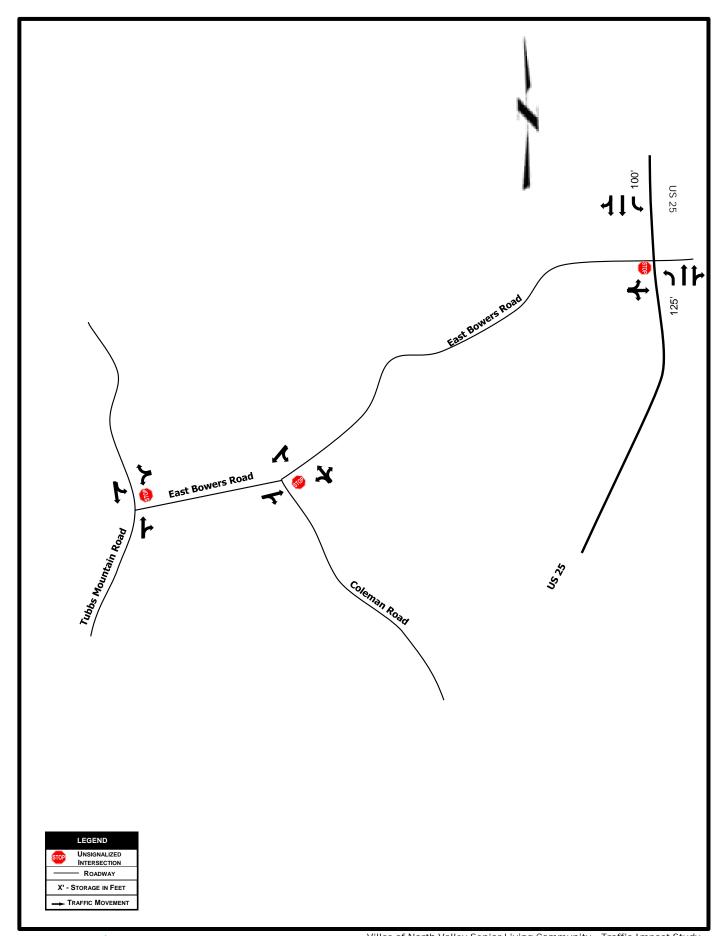
Vehicle turning movement counts were collected for this study by Short Counts. *Table 2* contains the count location, date, and provider.

Table 2 - Traffic Data Collection

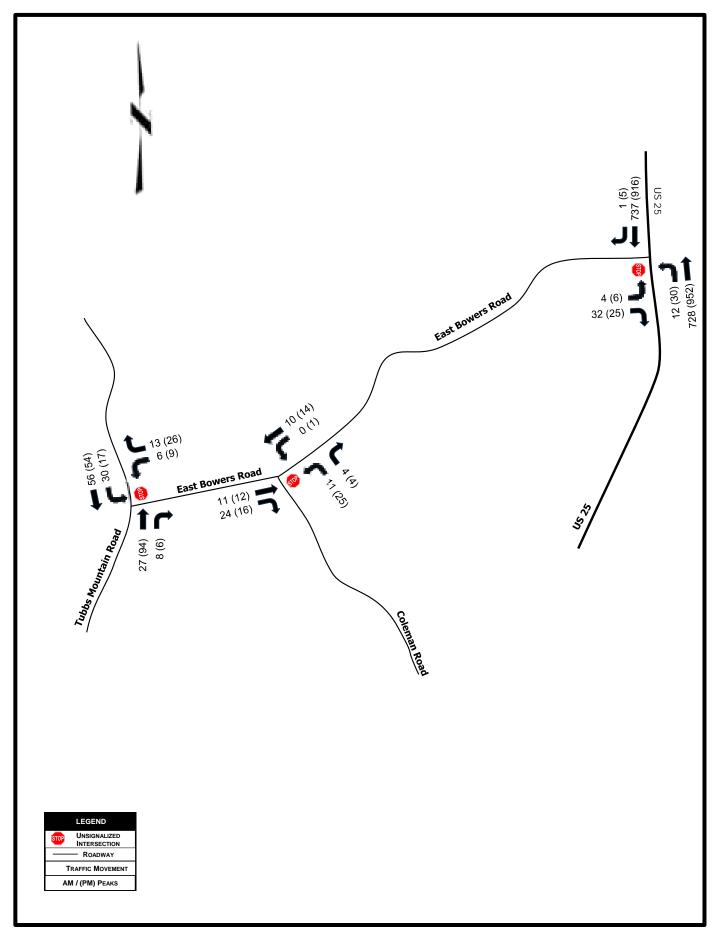
Count Location	Date	Ву
US 25 & East Bowers Road	11/29/23	Short Counts
East Bowers Road & Coleman Road	11/29/23	Short Counts
East Bowers Road & Tubbs Mountain Road	11/29/23	Short Counts

All counts were conducted while the local school district was in session. Existing traffic volumes are illustrated in *Figure 4*. The 2023 raw traffic volumes are provided in *Appendix B*.











PROJECT DEVELOPMENT

The senior living residential community is to be located south of East Bowers Road and east of Coleman Road in Travelers Rest, South Carolina. The development is planned to have 87 single family homes. The project site is currently undeveloped.

Proposed Access Points

The senior living residential community is expected to provide one full access on both East Bowers Road and Coleman Road. Site Access #1 is located on East Bowers Road approximately 750 feet east of Coleman Road and will serve the majority of the development. Site Access #2 is located on Coleman Road approximately 350 feet south of East Bowers Road and will serve 7 residences. The proposed driveways appear to meet the SCDOT ARMS spacing requirements.

Trip Generation Estimates

The trip generation potential was estimated based on the most recent edition of the ITE *Trip Generation Manual*. Since this is a Senior Living Community, Land Use Code (LUC) 251 - Senior Adult Housing - Single-Family was used as Senior Living Communities typically have 40-50% less trips than standard housing developments. The trip generation estimates for the weekday daily, the weekday AM peak-hour of the adjacent street, and the weekday PM peak-hour of the adjacent street time periods are shown in *Table 3*.

AM Peak PM Peak 24 Hour Size Land Use Unit LUC Two-Way DU Senior Adult Housing - Single-Family 526 12 23 35 24 16 40 Daily Trips: Ln(T) = 0.85 Ln(X) + 2.47 (50% In; 50% Out)

Table 3 – ITE Trip Generation Estimates

Trip Distribution & Assignment

New external traffic expected to be generated was distributed and assigned to the roadway network based on the existing patterns and surrounding land uses. The general distribution of new external project trips was assumed to be:

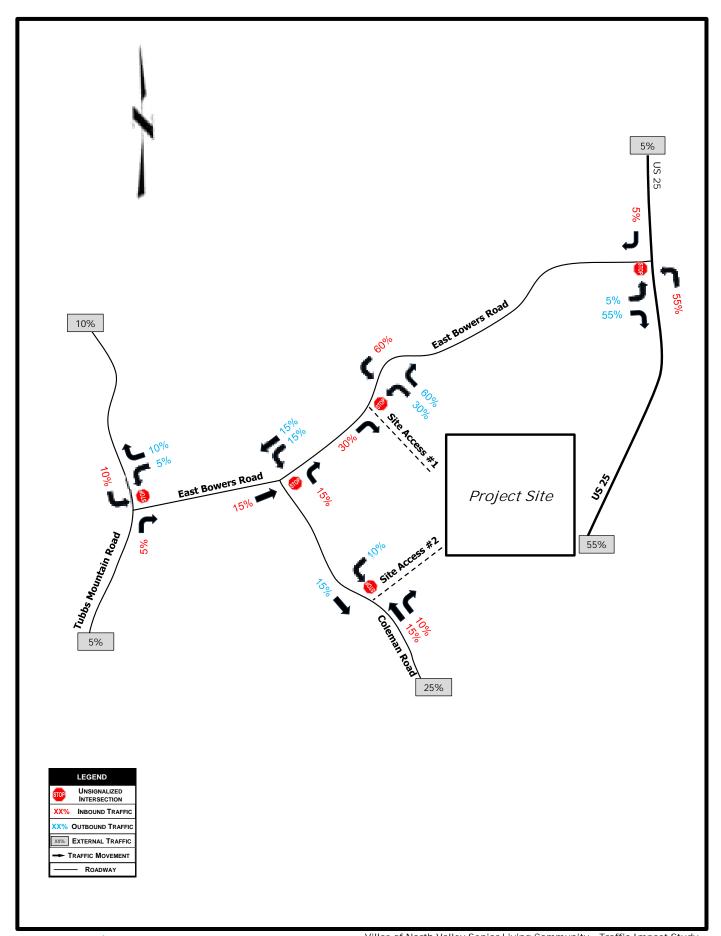
- 55% to/from the south via US 25
- 25% to/from the south via Coleman Road

AM Peak Hour Trips: Ln(T) = 0.76 Ln(X) + 0.16 (33% In; 67% Out) PM Peak Hour Trips: Ln(T) = 0.78 Ln(X) + 0.20 (61% In; 39% Out)

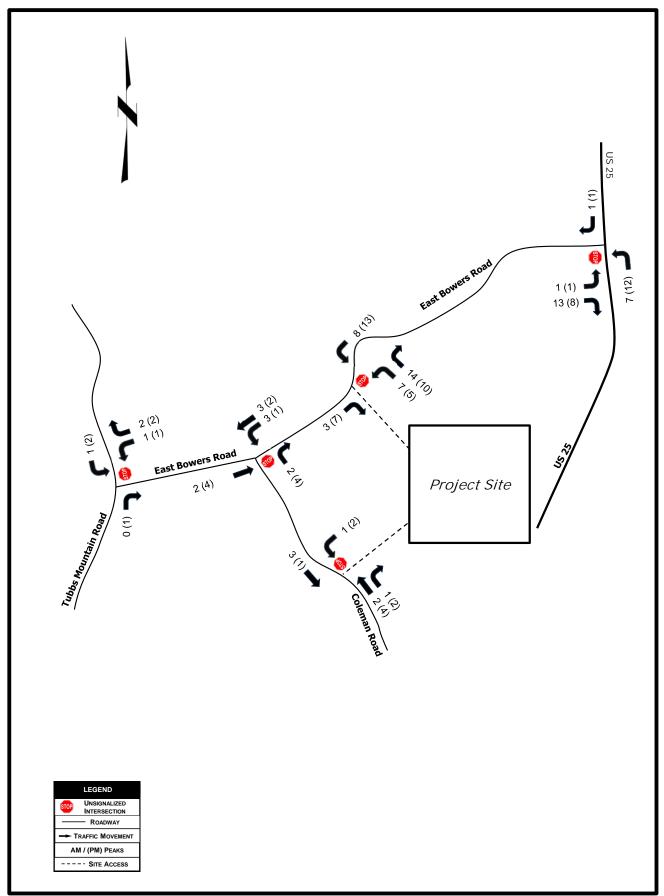
- 5% to/from the north via US 25
- 10% to/from the north via Tubbs Mountain Road
- 5% to/from the south via US Tubbs Mountain Road

The directional distribution assumptions are shown in *Figure 5*. The assignment of the project traffic is shown in *Figure 6*.











4. TRAFFIC VOLUMES

Background Conditions

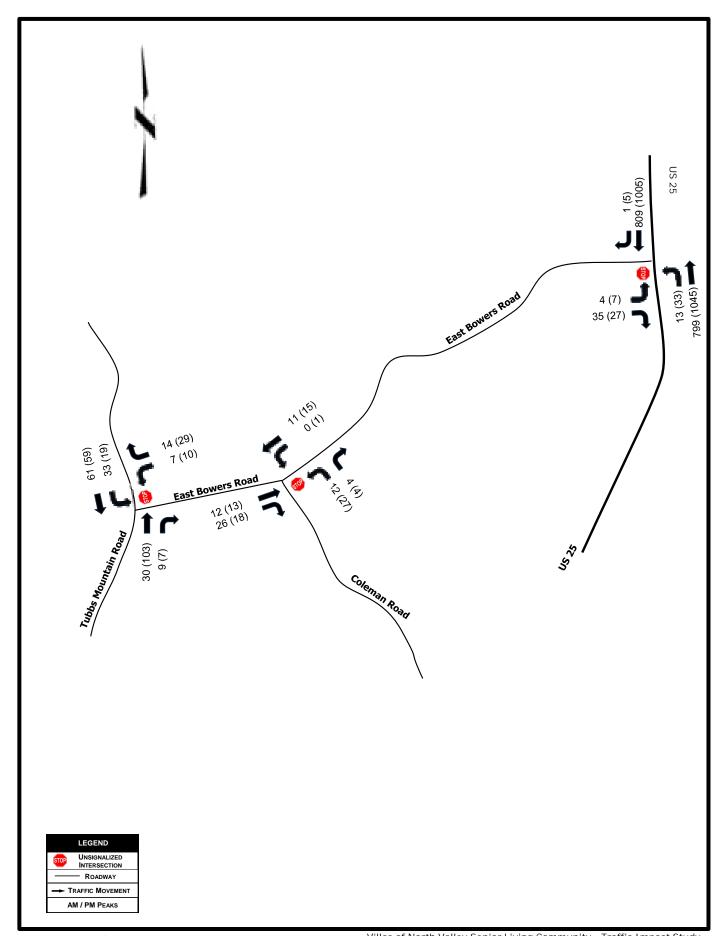
The 2026 future No-Build traffic volumes were developed using a 3.25% annual background growth rate. This growth rate was adopted from reviewing historic count data at SCDOT Count Stations 23-0115 and 23-0381 and observations of the growth pattern in the surrounding area. The 2026 No-Build traffic volumes are shown in *Figure 7*.

Build Out Traffic Volumes

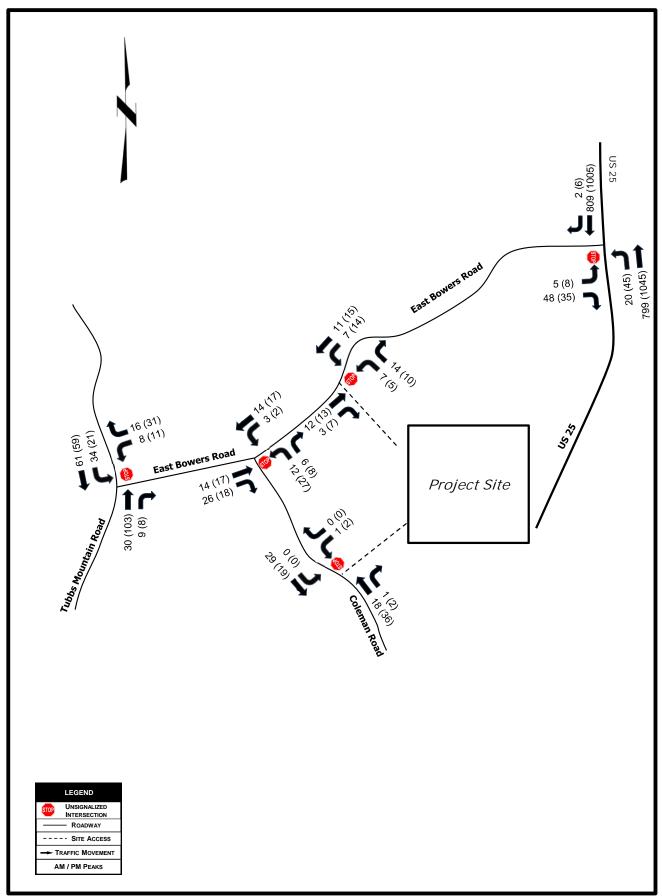
The 2026 Build traffic volumes were developed by adding the site generated traffic volumes to the 2026 No-Build traffic volumes. The 2026 Build volumes are illustrated in *Figure 8*.

Volume development worksheets are included in *Appendix C*.











TRAFFIC IMPACT ANALYSIS

Auxiliary Turn-Lane Analysis

Auxiliary turn-lane analyses were conducted using the 2026 Build volumes. Turn-lane analyses were considered based on the SCDOT Roadway Design Manual (RDM) Section 9.5.1.

Based on the anticipated build-out volumes, auxiliary turn-lanes on East Bowers Road and Coleman Road are not warranted at the access points. Turn-lane analyses are provided in *Appendix D*.

Level of Service Criteria

The Transportation Research Board's Highway Capacity Manual (HCM) utilizes a term "level of service" to measure how traffic operates in intersections and on roadway segments. There are currently six levels of service ranging from A to F. Level of service "A" represents the best conditions and Level of Service "F" represents the worst. Synchro Traffic Modeling software was used to determine the level of service for studied intersections. Note for unsignalized intersection analysis, the level of service noted is for the worst approach of the intersection. This is typically the left turn movement for the side street approach, due to the number of opposing movements.

The Highway Capacity Manual thresholds are shown in *Table 4*.

Table 4 – *HCM 6th Edition* LOS Criteria for Unsignalized Intersections

LOS	Control Delay per Vehicle (seconds)
	Unsignalized Intersections
А	≤10
В	> 10 and ≤ 15
С	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50



Intersection Capacity Analysis

Capacity analyses were conducted using *Synchro*, Version 11 software for the study intersections considering 2023 Existing conditions, 2026 No-Build conditions, and 2026 Build conditions.

As part of the capacity analysis, SCDOT's default *Synchro* parameters were utilized. A constant PHF of 0.92 was applied for future year analysis. Existing heavy vehicle percentages were utilized for all analysis scenarios, with a minimum percentage of 2% considered. Using the *Synchro* software, intersection analyses were conducted for the weekday AM peak-hour and weekday PM peak-hour time periods.

The results of the intersection capacity analyses are summarized in *Table 5*.

Table 5 – Intersection Capacity Analysis Results

				LOS/Delay	(seconds)		
Intersection	Approach	2023 E	xisting	2026 N	o-Build	2026	Build
		Cond	itions	Cond	itions	Cond	itions
		AM	PM	AM	PM	AM	PM
US 25 &	EB ²	B/12.8	C/16.0	B/13.4	C/17.8	B/13.6	C/18.0
East Bowers Road	NB ¹	A/9.5	B/10.5	A/9.8	B/11.0	A/9.9	B/11.2
East Bowers Road	WB ¹	A/0.0	A/7.3	A/0.0	A/7.3	A/7.3	A/7.3
& Coleman Road	NB ²	A/8.8	A/8.8	A/8.8	A/8.8	A/8.9	A/8.8
East Bowers Road &	WB^2	A/8.9	A/9.2	A/8.9	A/9.3	A/8.9	A/9.3
Tubbs Mountain Road	SB ¹	A/7.4	A/7.5	A/7.4	A/7.5	A/7.4	A/7.5
East Bowers Road	WB ¹					A/7.3	A/7.3
& Site Access #1	NB ²					A/8.6	A/8.6
Coleman Road	WB ²					A/8.8	A/8.8
& Site Access #2	SB ¹					A/0.0	A/0.0

¹LOS for major street left-turn movement; ²LOS for minor street approach

Site Accesses on East Bowers Road & Coleman Road

Both site access points should function with minimal delays. Accesses should be designed in accordance with Greenville County standards and with one ingress and one egress lane.

US 25 & East Bowers Road

With construction of the project, the intersection of US 25 & East Bowers Road should continue to function adequately. No changes are recommended.



East Bowers Road intersections with Coleman Road & Tubbs Mountain Road Both intersections should operate with minimal delays. No changes are recommended.

Recommendations

Based on the capacity analysis, no changes are recommended for any of the project intersections. All site accesses can function adequately with one ingress and egress.

Capacity analysis worksheets are provided in *Appendix E*.



6. SUMMARY OF FINDINGS AND RECOMMENDATIONS

A traffic impact study was conducted for the proposed Villas of North Valley senior living residential community in accordance with Greenville County and SCDOT guidelines. The development is to be located south of East Bowers Road and east of Coleman Road in Travelers Rest, South Carolina. The development is planned to have 87 senior adult single-family homes. Seven (7) of the homes will access Coleman Road at one location, the remaining 80 homes will access at one location on East Bowers Road. The community will be limited to residents 55 years old and older.

The site accesses can function adequately with one ingress and one egress lane. Based on the 2026 anticipated build out volumes, auxiliary turn-lanes on East Bowers Road and Coleman Road are not warranted at the site accesses. The site accesses should be designed to provide proper sight distances and meet Greenville County design criteria.

With construction of the project, all the study intersections should continue to function adequately; no changes are recommended.



APPENDIX A

Scoping Correspondence



Michael Dennis

From: Walters, Kurt < KWalters@greenvillecounty.org>

Sent: Wednesday, November 8, 2023 1:37 PM

To: Michael Dennis

Cc: Jeff Ingham; Smith, Joel J.

Subject: RE: Access Engineering Introductions

25 years and I finally have an office window and now I feel like Im in New York City. Our new LDR regulation requires a TIS at 50 lots in the unzoned areas. That being said, we would want to look at:

- Access points
- E Bowers & Coleman
- E Bowers & Tubbs Mt (SCDOT)
- E Bowers & US-25 (SCDOT)

The last two intersections intersect with DOT roads, so I have cc'd Joel Smith for any SCDOT input. Counts should be taken while school is in session. If you have any questions, please let me know.

Kurt Walters

Greenville County Traffic Engineer 301 University Ridge, <u>Suite S-3000</u> Greenville, SC 29601 864-467-7013

Helpful Links:

GreenvilleCounty.org
Public Works Page
Traffic Calming Policy
Speed Hump Request Form

From: Michael Dennis <mdennis@accesstrafficsc.com> Sent: Wednesday, November 8, 2023 12:41 PM To: Walters, Kurt <KWalters@greenvillecounty.org> Cc: Jeff Ingham <jingham@accesstrafficsc.com> Subject: FW: Access Engineering Introductions

CAUTION: This email is from an EXTERNAL source. Ensure you trust this sender before clicking on any links or attachments.

Kurt,

I hope you have been doing great and enjoying your new office. I was up at the Governors School to see my daughter last month and got to park in the new parking garage, but haven't made it in the building as of yet.

We been asked to scope a TIA for the attached site plan. The property will probably be annexed into the town of Travelers Rest, but the road is owned by Greenville County, so I wanted to see what intersections you would like us to include in our scope. There aren't but 82 lots in the development, so not sure if you would require them to have a TIA or not and the client isn't sure if TR will make them as well, but they want to get a jump incase they have to have one. Therefore, I get to bug you for you input.

APPENDIX B

Traffic Count Data





File Name: E Bowers Rd @ US 25

Site Code:

Start Date : 11/29/2023

Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

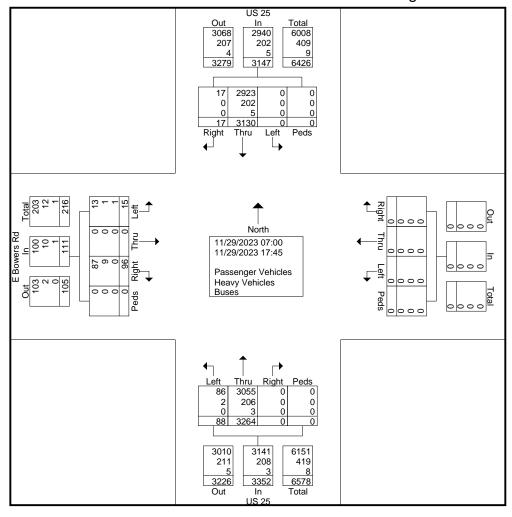
					roups P	rinted- F	rasseng	er venic	ies - Hea			uses					ı
		US								US	-			E Bow			
		South				Westb	ound			North	bound			Eastb	ound		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	0	135	1	0	0	0	0	0	1	147	0	0	0	0	3	0	287
07:15	0	213	2	0	0	0	0	0	2	160	0	0	0	0	9	0	386
07:30	0	208	0	0	0	0	0	0	3	161	0	0	0	0	5	0	377
07:45	0	178	1	0	0	0	0	0	3	182	0	0	2	0	13	0	379
Total	0	734	4	0	0	0	0	0	9	650	0	0	2	0	30	0	1429
08:00	0	177	0	0	0	0	0	0	6	177	0	0	2	0	7	0	369
08:15	0	174	0	ő	ő	Ö	0	ő	0	208	0	0	0	0	7	0	389
08:30	0	172	0	ő	0	0	0	ő	2	194	0	0	0	0	7	0	375
08:45	Ő	161	Ö	ő	ő	Ö	0	ő	4	192	0	ŏ	1	0	3	0	361
Total	0	684	0	0	0	0	0	0	12	771	0	0	3	0	24	0	1494
				- 1	-	-	-	- '			-	- 1					
16:00	0	175	3	0	0	0	0	0	6	191	0	0	2	0	3	0	380
16:15	0	215	1	0	0	0	0	0	13	239	0	0	0	0	5	0	473
16:30	0	194	4	0	0	0	0	0	5	236	0	0	2	0	4	0	445
16:45	0	216	1	0	0	0	0	0	8	227	0	0	1	0	7	0	460
Total	0	800	9	0	0	0	0	0	32	893	0	0	5	0	19	0	1758
17:00	0	225	3	0	0	0	0	0	5	236	0	0	1	0	10	0	480
17:15	0	257	1	0	0	0	0	0	7	261	0	0	2	0	7	0	535
17:30	0	218	0	0	0	0	0	0	10	228	0	0	2	0	1	0	459
17:45	0	212	0	0	0	0	0	0	13	225	0	0	0	0	5	0	455
Total	0	912	4	0	0	0	0	0	35	950	0	0	5	0	23	0	1929
Grand Total	0	3130	17	0	0	0	0	0	88	3264	0	0	15	0	96	0	6610
Apprch %	0	99.5	0.5	0	0	0	0	0	2.6	97.4	0	0	13.5	0	86.5	0	
Total %	0	47.4	0.3	0	0	0	0	0	1.3	49.4	0	0	0.2	0	1.5	0	
Passenger Vehicles	0	2923	17	0	0	0	0	0	86	3055	0	0	13	0	87	0	6181
% Passenger Vehicles	0	93.4	100	0	0	0	0	0	97.7	93.6	0	0	86.7	0	90.6	0	93.5
Heavy Vehicles	0	202	0	0	0	0	0	0	2	206	0	0	1	0	9	0	420
% Heavy Vehicles	0	6.5	0	0	0	0	0	0	2.3	6.3	0	0	6.7	0	9.4	0	6.4
Buses	0	5	0	0	0	0	0	0	0	3	0	0	1	0	0	0	9
% Buses	0	0.2	0	0	0	0	0	0	0	0.1	0	0	6.7	0	0	0	0.1



File Name: E Bowers Rd @ US 25

Site Code:

Start Date : 11/29/2023



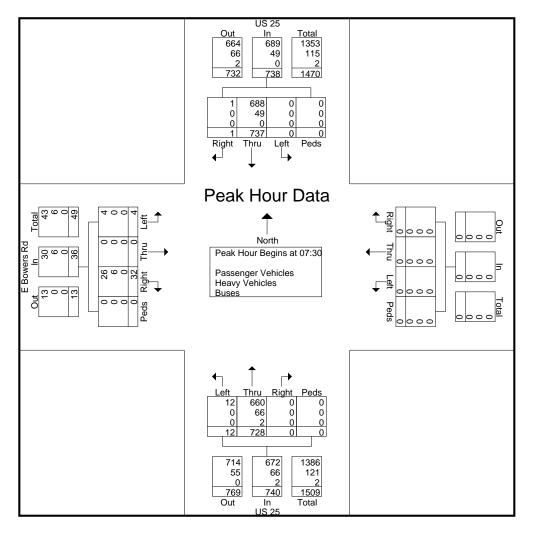


File Name: E Bowers Rd @ US 25

Site Code:

Start Date : 11/29/2023

																					1
			US 25	5		ak 1 of 1							US 25	5			E	Bowers	s Rd		
		Sc	outhbo	und			W	estbou	ınd			N	orthbo	und			Е	astbou	ınd		
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Ar	nalysis	From (07:00 to	0 08:4	5 - Peak	1 of 1															
Peak Hour fo	r Entire	Inters	ection	Begins	s at 07:3	0															
07:30	0	208	0	0	208	0	0	0	0	0	3	161	0	0	164	0	0	5	0	5	377
07:45	0	178	1	0	179	0	0	0	0	0	3	182	0	0	185	2	0	13	0	15	379
08:00	0	177	0	0	177	0	0	0	0	0	6	177	0	0	183	2	0	7	0	9	369
08:15	0	174	0	0	174	0	0	0	0	0	0	208	0	0	208	0	0	7	0	7	389
Total Volume	0	737	1	0	738	0	0	0	0	0	12	728	0	0	740	4	0	32	0	36	1514
% App. Total	0	99.9	0.1	0		0	0	0	0		1.6	98.4	0	0		11.1	0	88.9	0		
PHF	.000	.886	.250	.000	.887	.000	.000	.000	.000	.000	.500	.875	.000	.000	.889	.500	.000	.615	.000	.600	.973
Passenger Vehicles	0	688	1	0	689	0	0	0	0	0	12	660	0	0	672	4	0	26	0	30	1391
% Passenger Vehicles																					
Heavy Vehicles	0	49	0	0	49	0	0	0	0	0	0	66	0	0	66	0	0	6	0	6	121
% Heavy Vehicles	0	6.6	0	0	6.6	0	0	0	0	0	0	9.1	0	0	8.9	0	0	18.8	0	16.7	8.0
Buses	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
% Buses	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.1



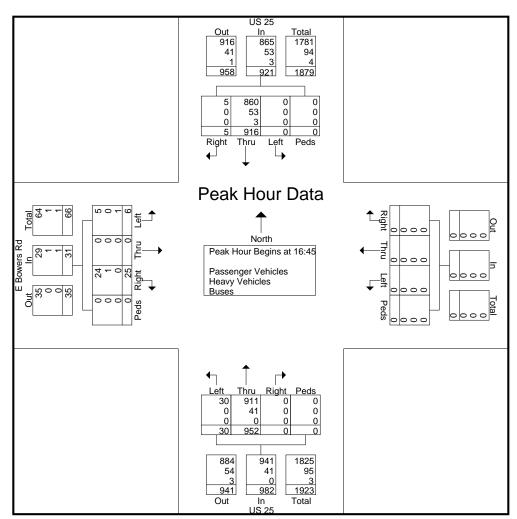


File Name: E Bowers Rd @ US 25

Site Code:

Start Date : 11/29/2023

		Sc	US 25				W	/estbou	und			N	US 25					Bowers			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Ar	nalysis	From 1	16:00 to	o 17:45	- Peak	1 of 1															
Peak Hour for	r Entire	Inters	ection	Begins	at 16:4	5															
16:45	0	216	1	0	217	0	0	0	0	0	8	227	0	0	235	1	0	7	0	8	460
17:00	0	225	3	0	228	0	0	0	0	0	5	236	0	0	241	1	0	10	0	11	480
17:15	0	257	1	0	258	0	0	0	0	0	7	261	0	0	268	2	0	7	0	9	535
17:30	0	218	0	0	218	0	0	0	0	0	10	228	0	0	238	2	0	1	0	3	459
Total Volume	0	916	5	0	921	0	0	0	0	0	30	952	0	0	982	6	0	25	0	31	1934
% App. Total	0	99.5	0.5	0		0	0	0	0		3.1	96.9	0	0		19.4	0	80.6	0		
PHF	.000	.891	.417	.000	.892	.000	.000	.000	.000	.000	.750	.912	.000	.000	.916	.750	.000	.625	.000	.705	.904
Passenger Vehicles	0	860	5	0	865	0	0	0	0	0	30	911	0	0	941	5	0	24	0	29	1835
% Passenger Vehicles																					
Heavy Vehicles	0	53	0	0	53	0	0	0	0	0	0	41	0	0	41	0	0	1	0	1	95
% Heavy Vehicles	0	5.8	0	0	5.8	0	0	0	0	0	0	4.3	0	0	4.2	0	0	4.0	0	3.2	4.9
Buses	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4
% Buses	0	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0	0	16.7	0	0	0	3.2	0.2







File Name: E Bowers Rd @ Coleman Rd

Site Code:

Start Date : 11/29/2023

Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

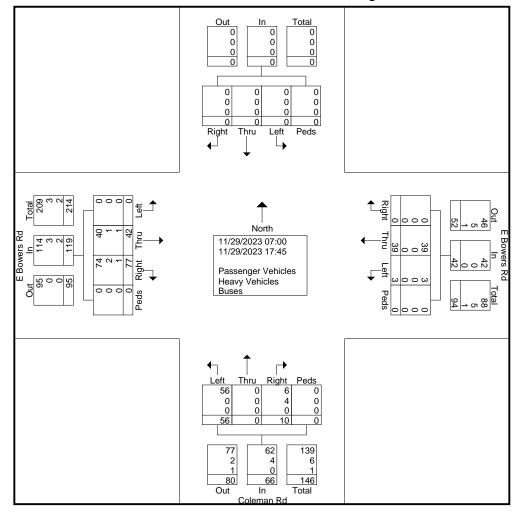
				ا	roups P	E Bow		er verno	ies - nea	Colem		uses		E Bow	ere Rd		
		Southl	oound			Westb				North				Eastb			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	0	0	0	0	0	2	0	0	1	0	0	0	0	0	5	0	8
07:00	0	0	0	0	1	1	0	0	0	0	0	0	0	1	8	0	11
07:30	0	0	0	0	0	Ó	0	0	2	0	1	0	0	2	8	0	13
07:45	0	0	0	0	0	3	0	0	2	0	1	0	0	6	5	0	17
Total	0	0	0	0	1	6	0	0	5	0		0	0	9	26	0	49
		-	•	- 1	-	_		- '	_	-	_						
08:00	0	0	0	0	0	3	0	0	4	0	1	0	0	2	4	0	14
08:15	0	0	0	0	0	4	0	0	3	0	1	0	0	1	7	0	16
08:30	0	0	0	0	0	0	0	0	1	0	0	0	0	2	7	0	10
08:45	0	0	0	0	0	1_	0	0	2	0	1_	0	0	3	4	0	11_
Total	0	0	0	0	0	8	0	0	10	0	3	0	0	8	22	0	51
1																	ı
16:00	0	0	0	0	0	3	0	0	2	0	0	0	0	5	6	0	16
16:15	0	0	0	0	0	6	0	0	5	0	1	0	0	1	3	0	16
16:30	0	0	0	0	0	1	0	0	5	0	0	0	0	7	2	0	15
16:45	0	0	0	0	0	8	0	0	2	0	1_	0	0	5	4	0	20
Total	0	0	0	0	0	18	0	0	14	0	2	0	0	18	15	0	67
17:00	0	0	0	0	0	2	0	0	10	0	2	0	0	1	2	0	17
17:15	0	0	0	0	0	2	0	0	6	0	0	0	0	3	4	0	15
17:30	0	0	0	0	1	2	0	0	7	0	1	0	0	3	6	0	20
17:45	0	0	0	0	1_	1_	0	0	4	0	0	0	0	0	2	0	88
Total	0	0	0	0	2	7	0	0	27	0	3	0	0	7	14	0	60
Grand Total	0	0	0	0	3	39	0	0	56	0	10	0	0	42	77	0	227
Apprch %	0	0	0	0	7.1	92.9	0	0	84.8	0	15.2	0	0	35.3	64.7	0	
Total %	0	0	0	0	1.3	17.2	0	0	24.7	0	4.4	0	0	18.5	33.9	0	
Passenger Vehicles	0	0	0	0	3	39	0	0	56	0	6	0	0	40	74	0	218
% Passenger Vehicles	0	0	0	0	100	100	0	0	100	0	60	0	0	95.2	96.1	0	96
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	4	0	0	1	2	0	7
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	40	0	0	2.4	2.6	0	3.1
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4	1.3	0	0.9



File Name: E Bowers Rd @ Coleman Rd

Site Code:

Start Date : 11/29/2023



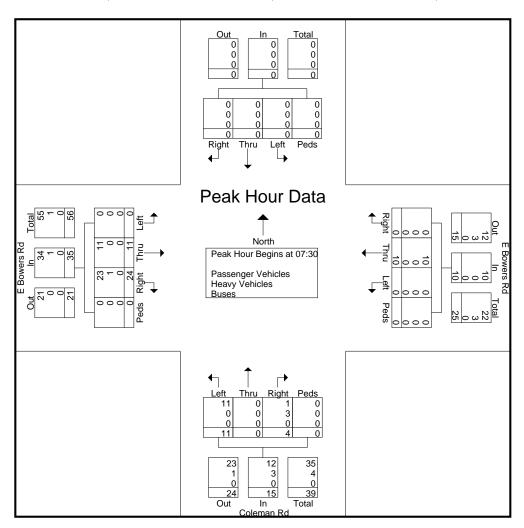


File Name: E Bowers Rd @ Coleman Rd

Site Code:

Start Date : 11/29/2023

		Sc	outhbou	ınd				Bowers estbou					oleman					Bowers			
Ctort Times	l oft			Peds		l of					l oft					l of			_		
Start Time	Left				App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Ar	nalysis	From (07:00 to	o 08:4	5 - Peak	1 of 1															
Peak Hour for	r Entire	Inters	ection	Begins	at 07:3	0															·
07:30	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	0	2	8	0	10	13
07:45	0	0	0	0	0	0	3	0	0	3	2	0	1	0	3	0	6	5	0	11	17
08:00	0	0	0	0	0	0	3	0	0	3	4	0	1	0	5	0	2	4	0	6	14
08:15	0	0	0	0	0	0	4	0	0	4	3	0	1	0	4	0	1	7	0	8	16
Total Volume	0	0	0	0	0	0	10	0	0	10	11	0	4	0	15	0	11	24	0	35	60
% App. Total	0	0	0	0		0	100	0	0		73.3	0	26.7	0		0	31.4	68.6	0		
PHF	.000	.000	.000	.000	.000	.000	.625	.000	.000	.625	.688	.000	1.00	.000	.750	.000	.458	.750	.000	.795	.882
Passenger Vehicles	0	0	0	0	0	0	10	0	0	10	11	0	1	0	12	0	11	23	0	34	56
% Passenger Vehicles																					
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	1	0	1	4
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	75.0	0	20.0	0	0	4.2	0	2.9	6.7
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



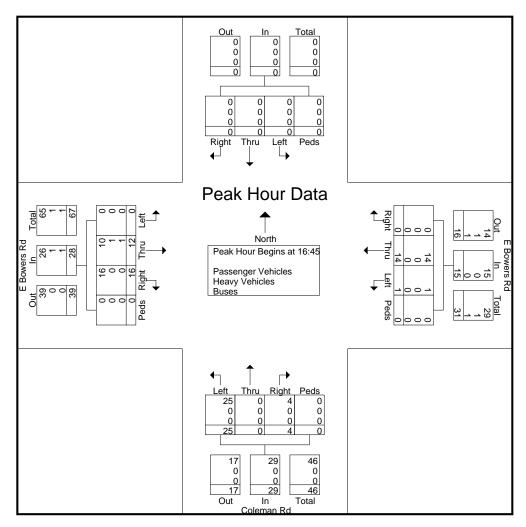


File Name: E Bowers Rd @ Coleman Rd

Site Code:

Start Date : 11/29/2023

		So	uthbou	und				Bowers estbou					oleman					Bowers			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Ar	nalysis	From 1	6:00 to	17:45	- Peak	1 of 1															
Peak Hour fo	r Entire	Interse	ection I	Begins	at 16:4	5															
16:45	0	0	0	0	0	0	8	0	0	8	2	0	1	0	3	0	5	4	0	9	20
17:00	0	0	0	0	0	0	2	0	0	2	10	0	2	0	12	0	1	2	0	3	17
17:15	0	0	0	0	0	0	2	0	0	2	6	0	0	0	6	0	3	4	0	7	15
17:30	0	0	0	0	0	1	2	0	0	3	7	0	1	0	8	0	3	6	0	9	20
Total Volume	0	0	0	0	0	1	14	0	0	15	25	0	4	0	29	0	12	16	0	28	72
% App. Total	0	0	0	0		6.7	93.3	0	0		86.2	0	13.8	0		0	42.9	57.1	0		
PHF	.000	.000	.000	.000	.000	.250	.438	.000	.000	.469	.625	.000	.500	.000	.604	.000	.600	.667	.000	.778	.900
Passenger Vehicles	0	0	0	0	0	1	14	0	0	15	25	0	4	0	29	0	10	16	0	26	70
% Passenger Vehicles																					
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.3	0	0	3.6	1.4
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.3	0	0	3.6	1.4







File Name: Tubbs Mountain Rd @ E Bowers Rd

Site Code:

Start Date : 11/29/2023

Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

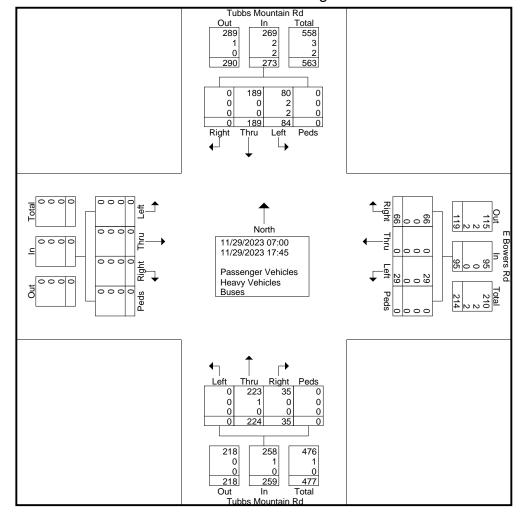
	Tu		untain R		noups r	E Bowe	ers Rd	7 7 01110		ıbbs Mo	untain R						
		South	oound			Westb	ound			Northb	ound			Eastb	ound		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	6	13	0	0	2	0	1	0	0	3	0	0	0	0	0	0	25
07:15	7	4	0	0	0	0	1	0	0	3	2	0	0	0	0	0	17
07:30	7	13	0	0	0	0	2	0	0	6	2	0	0	0	0	0	30
07:45	9	10	0	0	1_	00	1	0	0	7	2	0	0	0_	0	0	30
Total	29	40	0	0	3	0	5	0	0	19	6	0	0	0	0	0	102
22.22				ا م			•				_	ا م		•			
08:00	6	8	0	0	2	0	6	0	0	8	2	0	0	0	0	0	32
08:15 08:30	8 5	25 10	0	0	3	0	4 1	0	0 0	6 7	2	0	0	0	0	0	48
08:45	5 4	8	0	0	1	0	3	0	0	8	3	0	0	0	0	0	24 27
Total	23	<u>o</u> 51	0	0	6	0	<u>3</u> 14	0	0	<u>0</u> 29	<u>s</u> 8	0	0	0	0	0	131
Total	23	31	U	0	O	U	14	0	U	29	0	O	U	U	U	U	131
16:00	6	9	0	0	0	0	4	0	0	23	4	0	0	0	0	0	46
16:15	2	16	0	0	3	0	10	0	0	19	3	0	0	0	0	0	53
16:30	0	9	0	0	4	0	2	0	0	21	6	0	0	0	0	0	42
16:45	7	10	0	0	4	0	5	0	0	19	2	0	0	0	0	0	47
Total	15	44	0	0	11	0	21	0	0	82	15	0	0	0	0	0	188
1			_	- 1	_	_	_	- 1	_			- 1	_	_	_	_	
17:00	1	16	0	0	2	0	9	0	0	26	1	0	0	0	0	0	55
17:15	7	11	0	0	3	0	6	0	0	19	1	0	0	0	0	0	47
17:30	6	16	0	0	2	0	6	0	0	20	3	0	0	0	0	0	53
17:45	3	11_	0	0	2	0	5_	0	0	29	1_	0	0	0	0	0	51_
Total	17	54	0	0	9	0	26	0	0	94	6	0	0	0	0	0	206
Grand Total	84	189	0	0	29	0	66	0	0	224	35	0	0	0	0	0	627
Apprch %	30.8	69.2	0	0	30.5	0	69.5	0	0	86.5	13.5	0	0	0	0	0	021
Total %	13.4	30.1	0	0	4.6	0	10.5	0	0	35.7	5.6	0	0	0	0	0	
Passenger Vehicles	80	189	0	0	29	0	66	0	0	223	35	0	0	0	0	0	622
% Passenger Vehicles	95.2	100	0	0	100	0	100	0	0	99.6	100	0	0	0	0	0	99.2
Heavy Vehicles	2	0	0	0	0	0	0	0	0	99.0	0	0	0	0	0	0	3
% Heavy Vehicles	2.4	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0.5
Buses	2	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	2
% Buses	2.4	Ő	Ö	ő	Ö	0	0	ő	0	Ö	Ő	ő	Ő	Ö	0	0	0.3



File Name: Tubbs Mountain Rd @ E Bowers Rd

Site Code:

Start Date : 11/29/2023



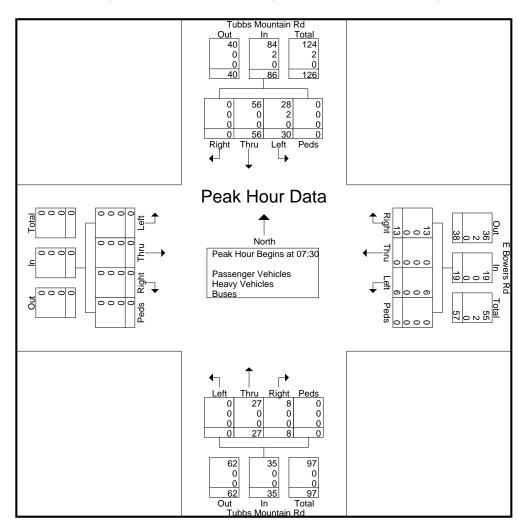


File Name: Tubbs Mountain Rd @ E Bowers Rd

Site Code:

Start Date : 11/29/2023

		Tubbs	Moun	tain Ro	t		ΕE	Bowers	Rd			Tubbs	Moun	tain R	d						
		Sc	outhboo	und			W	estbou	ınd			N	orthbo	und			Е	astbou	ınd		
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Ar	nalysis	From (07:00 to	o 08:45	- Peak	1 of 1															
Peak Hour fo	r Entire	Inters	ection	Begins	at 07:3	0															
07:30	7	13	0	0	20	0	0	2	0	2	0	6	2	0	8	0	0	0	0	0	30
07:45	9	10	0	0	19	1	0	1	0	2	0	7	2	0	9	0	0	0	0	0	30
08:00	6	8	0	0	14	2	0	6	0	8	0	8	2	0	10	0	0	0	0	0	32
08:15	8	25	0	0	33	3	0	4	0	7	0	6	2	0	8	0	0	0	0	0	48
Total Volume	30	56	0	0	86	6	0	13	0	19	0	27	8	0	35	0	0	0	0	0	140
% App. Total	34.9	65.1	0	0		31.6	0	68.4	0		0	77.1	22.9	0		0	0	0	0		
PHF	.833	.560	.000	.000	.652	.500	.000	.542	.000	.594	.000	.844	1.00	.000	.875	.000	.000	.000	.000	.000	.729
Passenger Vehicles	28	56	0	0	84	6	0	13	0	19	0	27	8	0	35	0	0	0	0	0	138
% Passenger Vehicles																					
Heavy Vehicles	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Heavy Vehicles	6.7	0	0	0	2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



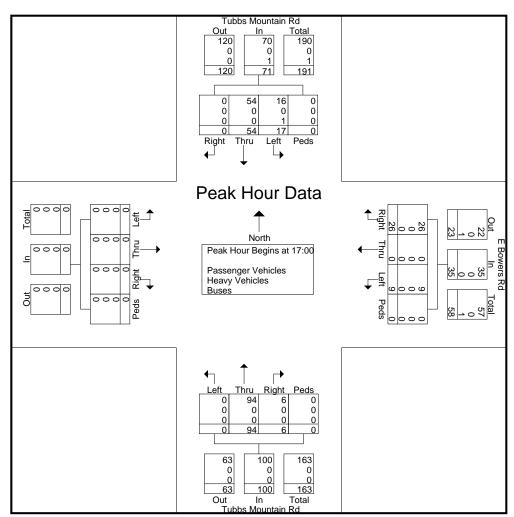


File Name: Tubbs Mountain Rd @ E Bowers Rd

Site Code:

Start Date : 11/29/2023

		Tubbs	Moun		t			Bowers estboo					Moun orthbo		d		Е	astbou	ınd		
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Ar	nalysis	From 1	6:00 to	o 17:45	- Peak	1 of 1															
Peak Hour fo	r Entire	Inters	ection	Begins	at 17:0	0															
17:00	1	16	0	0	17	2	0	9	0	11	0	26	1	0	27	0	0	0	0	0	55
17:15	7	11	0	0	18	3	0	6	0	9	0	19	1	0	20	0	0	0	0	0	47
17:30	6	16	0	0	22	2	0	6	0	8	0	20	3	0	23	0	0	0	0	0	53
17:45	3	11	0	0	14	2	0	5	0	7	0	29	1	0	30	0	0	0	0	0	51
Total Volume	17	54	0	0	71	9	0	26	0	35	0	94	6	0	100	0	0	0	0	0	206
% App. Total	23.9	76.1	0	0		25.7	0	74.3	0		0	94	6	0		0	0	0	0		
PHF	.607	.844	.000	.000	.807	.750	.000	.722	.000	.795	.000	.810	.500	.000	.833	.000	.000	.000	.000	.000	.936
Passenger Vehicles	16	54	0	0	70	9	0	26	0	35	0	94	6	0	100	0	0	0	0	0	205
% Passenger Vehicles																					
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Buses	5.9	0	0	0	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5





APPENDIX C

Traffic Volume Development & ITE Trip Generation Worksheets



US 25 & East Bowers Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: Wednesday, November 29, 2023

AM PEAK HOUR (7:30-8:30 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES	4		32				12	728			737	1
Heavy Vehicle Percentage	2%	2%	10%	2%	2%	2%	2%	9%	2%	2%	7%	2%
Years To Buildout (2026)	3		3				3	3			3	3
Yearly Growth Rate	3.3%		3.3%				3.3%	3.3%			3.3%	3.3%
Background Traffic Growth	0		3				1	71			72	0
2026 NO-BUILD TRAFFIC VOLUMES	4		35				13	799			809	1
Inbound Trip Distribution Percentage							55%					5%
Outbound Trip Distribution Percentage	5%		55%									
Inbound New Project Traffic							7					1
Outbound New Project Traffic	1		13									
Total New Project Traffic	1		13				7					1
2026 BUILD TRAFFIC VOLUMES	5		48				20	799			809	2

PM PEAK HOUR (4:45-5:45 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES	6		25				30	952			916	5
Heavy Vehicle Percentage	11%	2%	4%	2%	2%	2%	2%	4%	2%	2%	6%	2%
Years To Buildout (2026)	3		3				3	3			3	3
Yearly Growth Rate	3.3%		3.3%				3.3%	3.3%			3.3%	3.3%
Background Traffic Growth	1		2				3	93			89	0
2026 NO-BUILD TRAFFIC VOLUMES	7		27				33	1,045			1,005	5
Inbound Trip Distribution Percentage							55%					5%
Outbound Trip Distribution Percentage	5%		55%									
Inbound New Project Traffic							12					1
Outbound New Project Traffic	1		8									
Total New Project Traffic	1		8				12					1
2026 BUILD TRAFFIC VOLUMES	8		35				45	1,045			1,005	6



East Bowers Road & Coleman Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: Wednesday, November 29, 2023

AM PEAK HOUR (7:30-8:30 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES		11	24	0	10		11		4			
Heavy Vehicle Percentage		2%	4%	2%	2%		2%		50%			
Years To Buildout (2026)		3	3	3	3		3		3			
Yearly Growth Rate		3.3%	3.3%	3.3%	3.3%		3.3%		3.3%			
Background Traffic Growth		1	2	0	1		1		0			
2026 NO-BUILD TRAFFIC VOLUMES		12	26	0	11		12		4			
Inbound Trip Distribution Percentage		15%							15%			
Outbound Trip Distribution Percentage				15%	15%							
Inbound New Project Traffic		2							2			
Outbound New Project Traffic				3	3							
Total New Project Traffic		2		3	3				2			
2026 BUILD TRAFFIC VOLUMES		14	26	3	14		12		6			

PM PEAK HOUR (4:45-5:45 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES		12	16	1	14		25		4			
Heavy Vehicle Percentage		5%	2%	2%	2%		2%		2%			
Years To Buildout (2026)		3	3	3	3		3		3			
Yearly Growth Rate		3.3%	3.3%	3.3%	3.3%		3.3%		3.3%			
Background Traffic Growth		1	2	0	1		2		0			
2026 NO-BUILD TRAFFIC VOLUMES		13	18	1	15		27		4			
Inbound Trip Distribution Percentage		15%							15%			
Outbound Trip Distribution Percentage				15%	15%							
Inbound New Project Traffic		4							4			
Outbound New Project Traffic				1	2							
Total New Project Traffic		4		1	2				4			
2026 BUILD TRAFFIC VOLUMES		17	18	2	17		27		8			



East Bowers Road & Tubbs Mountain Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: Wednesday, November 29, 2023

AM PEAK HOUR (7:30-8:30 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES				6		13		27	8	30	56	
Heavy Vehicle Percentage				2%		2%		2%	2%	7%	2%	
Years To Buildout (2026)				3		3		3	3	3	3	
Yearly Growth Rate				3.3%		3.3%		3.3%	3.3%	3.3%	3.3%	
Background Traffic Growth				1		1		3	1	3	5	
2026 NO-BUILD TRAFFIC VOLUMES				7		14		30	9	33	61	
Inbound Trip Distribution Percentage									5%	10%		
Outbound Trip Distribution Percentage				5%		10%						
Inbound New Project Traffic										1		
Outbound New Project Traffic				1		2						
Total New Project Traffic				1		2				1		
2026 BUILD TRAFFIC VOLUMES				8		16		30	9	34	61	

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES				9		26		94	6	17	54	
Heavy Vehicle Percentage				2%		2%		2%	2%	6%	2%	
Years To Buildout (2026)				3		3		3	3	3	3	
Yearly Growth Rate				3.3%		3.3%		3.3%	3.3%	3.3%	3.3%	
Background Traffic Growth				1		3		9	1	2	5	
2026 NO-BUILD TRAFFIC VOLUMES				10		29		103	7	19	59	
Inbound Trip Distribution Percentage									5%	10%		
Outbound Trip Distribution Percentage				5%		10%						
Inbound New Project Traffic									1	2		
Outbound New Project Traffic				1		2						
Total New Project Traffic				1		2			1	2		
2026 BUILD TRAFFIC VOLUMES				11		31		103	8	21	59	



East Bowers Road & Site Access #1

TRAFFIC CONTROL: Unsignalized DATE COUNTED: N/A

AM PEAK HOUR (7:30-8:30 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES		11	0	0	10		0		0			
Heavy Vehicle Percentage		2%	2%	2%	2%		2%		2%			
Years To Buildout (2026)		3	3	3	3		3		3			
Yearly Growth Rate		3.3%	3.3%	3.3%	3.3%		3.3%		3.3%			
Background Traffic Growth		1	0	0	1		0		0			
2026 NO-BUILD TRAFFIC VOLUMES		12	0	0	11		0		0			
Inbound Trip Distribution Percentage			30%	60%								
Outbound Trip Distribution Percentage							30%		60%			
Inbound New Project Traffic			3	7								

7

3

7

7

14

14

14

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES		12	0	0	14		0		0			
Heavy Vehicle Percentage		2%	2%	2%	2%		2%		2%			
Years To Buildout (2026)		3	3	3	3		3		3			
Yearly Growth Rate		3.3%	3.3%	3.3%	3.3%		3.3%		3.3%			
Background Traffic Growth		1	0	0	1		0		0			
2026 NO-BUILD TRAFFIC VOLUMES		13	0	0	15		0		0			
Inbound Trip Distribution Percentage			30%	60%								
Outbound Trip Distribution Percentage							30%		60%			
Inbound New Project Traffic			7	14								
Outbound New Project Traffic							5		10			
Total New Project Traffic			7	14			5		10			
2026 BUILD TRAFFIC VOLUMES		13	7	14	15		5		10			



Outbound New Project Traffic

Total New Project Traffic

2026 BUILD TRAFFIC VOLUMES

Coleman Road & Site Access #2

TRAFFIC CONTROL: Unsignalized DATE COUNTED: N/A

AM PEAK HOUR (7:30-8:30 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES				0		0		15	0	0	24	
Heavy Vehicle Percentage				2%		2%		2%	2%	2%	2%	
Years To Buildout (2026)				3		3		3	3	3	3	
Yearly Growth Rate				3.3%		3.3%		3.3%	3.3%	3.3%	3.3%	
Background Traffic Growth				0		0		1	0	0	2	
2026 NO-BUILD TRAFFIC VOLUMES				0		0		16	0	0	26	
Inbound Trip Distribution Percentage								15%	10%			
Outbound Trip Distribution Percentage				10%							15%	
Inbound New Project Traffic								2	1			
Outbound New Project Traffic				1							3	
Total New Project Traffic				1				2	1		3	
2026 BUILD TRAFFIC VOLUMES				1		0		18	1	0	29	

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2023 TRAFFIC VOLUMES				0		0		29	0	0	16	
Heavy Vehicle Percentage				2%		2%		2%	2%	2%	2%	
Years To Buildout (2026)				3		3		3	3	3	3	
Yearly Growth Rate				3.3%		3.3%		3.3%	3.3%	3.3%	3.3%	
Background Traffic Growth				0		0		3	0	0	2	
2026 NO-BUILD TRAFFIC VOLUMES				0		0		32	0	0	18	
Inbound Trip Distribution Percentage								15%	10%			
Outbound Trip Distribution Percentage				10%							15%	
Inbound New Project Traffic								4	2			
Outbound New Project Traffic				2							1	
Total New Project Traffic				2				4	2		1	
2026 BUILD TRAFFIC VOLUMES			·	2		0		36	2	0	19	



Land Use: 251 Senior Adult Housing—Single-Family

Description

Senior adult housing—single-family sites are independent living developments that are called various names including retirement communities, age-restricted housing, and active adult communities. The development has a specific age restriction for its residents, typically a minimum of 55 years of age for at least one resident of the household.

Residents in these communities are typically considered active and requiring little to no medical supervision. The percentage of retired residents varies by development. The development may include amenities such as a golf course, swimming pool, 24-hour security, transportation, and common recreational facilities. They generally lack centralized dining and on-site health facilities.

The dwelling units can be either detached or attached. The types of housing types represented by sites in the database include traditional single-family detached homes, patio homes, duplexes, and townhouses. Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Senior adult housing—multifamily (Land Use 252), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related land uses.

Additional Data

Caution should be used when applying trip rates for this land use as it may contain a wide variety of studies ranging from communities with very active, working residents to communities with older, retired residents. As more data become available, consideration will be given to future stratification of this land use.

Many factors affected the trip rates for detached senior adult housing. Factors such as the average age of residents, development location and size, affluence of residents, employment status, and vehicular access should be taken into consideration when conducting an analysis. Some developments were located within close proximity to medical facilities, restaurants, shopping centers, banks, and recreational activities.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/tripand-parking-generation/).

For the six sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 98 percent of the units were occupied.



The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Delaware, Florida, Maryland, New Jersey, New York, Pennsylvania, Virginia, and Washington.

Source Numbers

221, 289, 398, 421, 500, 550, 598, 601, 602, 629, 930, 1015, 1060, 1074



Senior Adult Housing - Single-Family (251)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

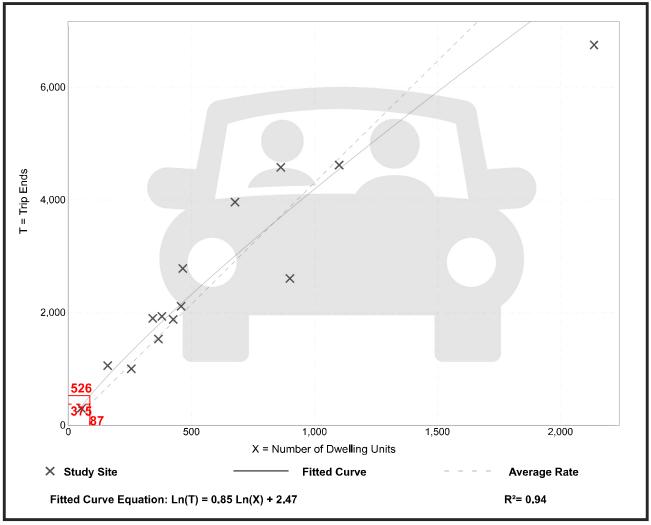
Number of Studies: 15 Avg. Num. of Dwelling Units: 646

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.31	2.90 - 6.66	1.07

Data Plot and Equation



Trip Gen Manual, 11th Edition

Institute of Transportation Engineers

https://itetripgen.org/printGraph 1/1

Senior Adult Housing - Single-Family (251)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

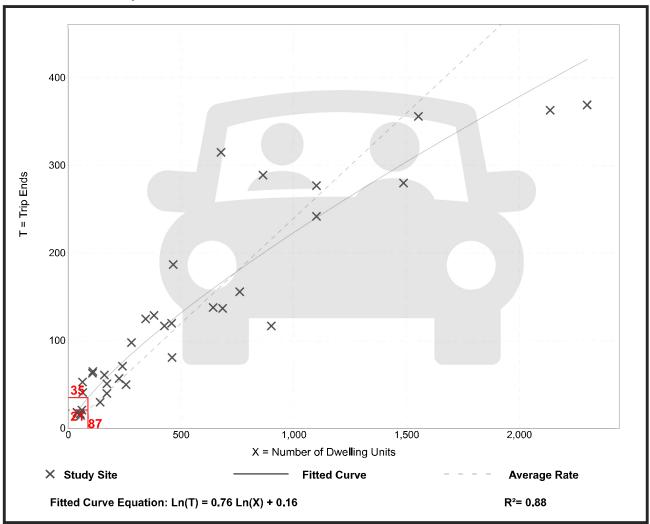
Number of Studies: 34 Avg. Num. of Dwelling Units: 557

Directional Distribution: 33% entering, 67% exiting

Vehicle Trip Generation per Dwelling Unit

Avera	age Rate	Range of Rates	Standard Deviation
c	0.24	0.13 - 0.84	0.10

Data Plot and Equation



Trip Gen Manual, 11th Edition

Institute of Transportation Engineers

https://itetripgen.org/printGraph 1/1

Senior Adult Housing - Single-Family (251)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

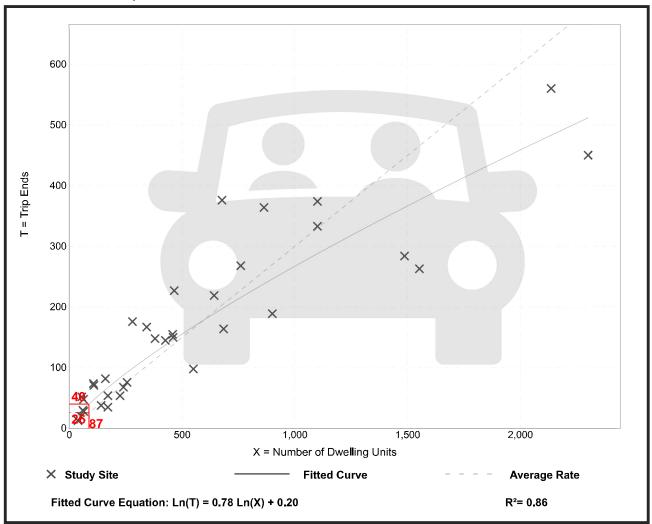
Number of Studies: 35 Avg. Num. of Dwelling Units: 556

Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.17 - 0.95	0.12

Data Plot and Equation



Trip Gen Manual, 11th Edition

Institute of Transportation Engineers

https://itetripgen.org/printGraph 1/1

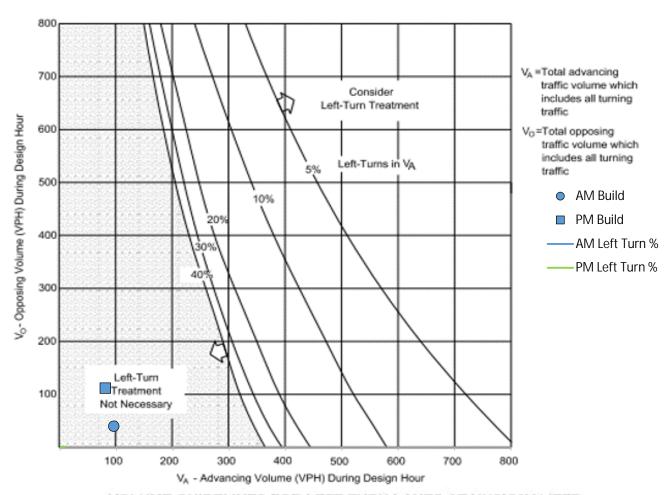
APPENDIX D

Turn Lane Analysis Worksheets



The Villas of North Valley TIS LEFT-TURN LANE WARRANT REVIEW

March 2017 INTERSECTIONS 9.5-9



VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS (40 mph) Figure 9.5-G

East Bowers Road & Tubbs Mountain Road

MOVEMENT: Southbound left turn

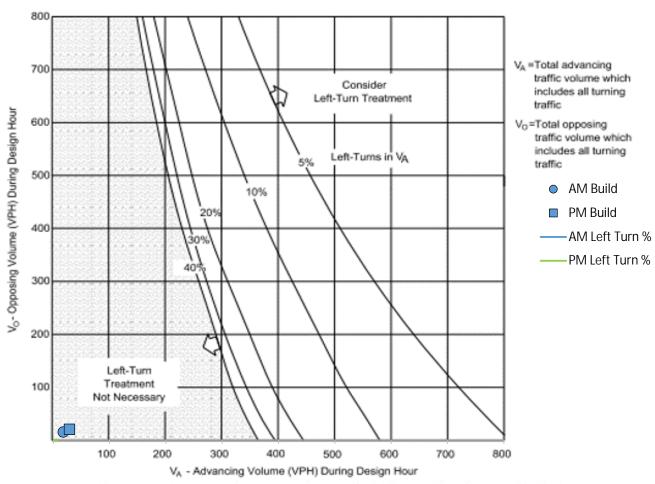
INTERSECTION:

SCENARIO	Advancing Volume (V _a)	Southbound left turn	Opposing Volume (V _o)	Left Turn % of V _a	Symbol
AM Build	95	34	39	35.8%	0
PM Build	80	21	111	26.3%	



The Villas of North Valley TIS LEFT-TURN LANE WARRANT REVIEW

March 2017 INTERSECTIONS 9.5-9



VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS (40 mph) Figure 9.5-G

INTERSECTION: East Bowers Road & Site Access #1

MOVEMENT: Westbound left turn

SCENARIO	Advancing Volume (V _a)	Westbound left turn	Opposing Volume (V _o)	Left Turn % of V _a	Symbol
AM Build	18	7	15	38.9%	0
PM Build	29	14	20	48.3%	



APPENDIX E

Capacity Analysis



2023 Existing Conditions



Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		ች	∱ \$		ሻ	†	
Traffic Vol, veh/h	4	0	32	0	0	0	12	728	0	0	737	1
Future Vol, veh/h	4	0	32	0	0	0	12	728	0	0	737	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage	,# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	10	2	2	2	2	9	2	2	7	2
Mvmt Flow	4	0	35	0	0	0	13	791	0	0	801	1
Major/Minor N	/linor2		N	Minor1		N	/lajor1		N	/lajor2		
	1224	1619	401	1218	1619	396	802	0	0	791	0	0
Conflicting Flow All Stage 1	802	802	401	817	817	390	002	-	-	191	-	-
Stage 2	422	817	-	401	802	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	7.1	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	7.1	6.54	5.54	0.74	4.14	_	_	4.14	_	
Critical Hdwy Stg 2	6.54	5.54	_	6.54	5.54	_		_	_		-	_
Follow-up Hdwy	3.52	4.02	3.4	3.52	4.02	3.32	2.22	<u>-</u>	_	2.22	_	_
Pot Cap-1 Maneuver	135	102	577	136	102	603	817	_	_	825	_	_
Stage 1	344	395	-	337	388	-	-	_	_	-	_	_
Stage 2	580	388	_	597	395	_		_	_	_	_	_
Platoon blocked, %	- 500	500		071	- 070			_	_		_	_
Mov Cap-1 Maneuver	133	100	577	126	100	603	817	-	-	825	-	-
Mov Cap-2 Maneuver	249	223	-	126	100	- 500	-	_	_	-	_	_
Stage 1	338	395	-	332	382	-	-	-	-	-	-	-
Stage 2	571	382	-	561	395	-	_	_	_	-	_	-
Annanaah	ED.			MD			ND			CD		
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.8			0			0.2			0		
HCM LOS	В			Α								
Minor Lane/Major Mvm	ıt	NBL	NBT	NBR E	EBLn1V	VBL _{n1}	SBL	SBT	SBR			
Capacity (veh/h)		817	-	-	503	-	825	-	-			
HCM Lane V/C Ratio		0.016	-	-	0.078	-	-	-	-			
HCM Control Delay (s)		9.5	-	-	12.8	0	0	-	-			
HCM Lane LOS		Α	-	-	В	Α	Α	-	-			
HCM 95th %tile Q(veh))	0	-	-	0.3	-	0	-	-			

-						
Intersection						
Int Delay, s/veh	2.2					
		EDD	MOI	WDT	NDI	NDD
	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	₽			4	, A	
Traffic Vol, veh/h	11	24	0	10	11	4
Future Vol, veh/h	11	24	0	10	11	4
Conflicting Peds, #/hr	0	0	0	0	0	0
	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	2	2	2	50
Mymt Flow	12	26	0	11	12	4
IVIVIIIL I IUW	12	20	U		ΊZ	4
Major/Minor Ma	ajor1	ľ	Major2		Minor1	
Conflicting Flow All	0	0	38	0	36	25
Stage 1	-	-	-	-	25	-
Stage 2	_	_	_	_	11	_
Critical Hdwy	_		4.12		6.42	6.7
Critical Hdwy Stg 1	_	_	4.12	-	5.42	0.7
		-	-		5.42	
Critical Hdwy Stg 2	-	-	2 210	-		- 2.75
Follow-up Hdwy	-	-	2.218		3.518	3.75
Pot Cap-1 Maneuver	-	-	1572	-	977	928
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	1012	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1572	-	977	928
Mov Cap-2 Maneuver	-	-	-	-	977	-
Stage 1	-	-	-	-	998	-
Stage 2	_	_	_	_	1012	_
Jugo Z					1012	
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		8.8	
HCM LOS					Α	
		IDI. 1			14/51	14/5-
Minor Lane/Major Mvmt		VBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		963	-	-	1572	-
HCM Lane V/C Ratio		0.017	-	-	-	-
HCM Control Delay (s)		8.8	-	-	0	-
HCM Lane LOS		Α	-	-	Α	-
HCM 95th %tile Q(veh)		0.1	_	_	0	-
		3.1				

Intersection						
Int Delay, s/veh	2.8					
		MED	NET	NES	051	ODT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		₽			4
Traffic Vol, veh/h	6	13	27	8	30	56
Future Vol, veh/h	6	13	27	8	30	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage		-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	72	2
Mymt Flow	7	14	29	9	33	61
IVIVIIIL FIOW	/	14	29	7	33	01
Major/Minor	Minor1	N	/lajor1	1	Major2	
Conflicting Flow All	161	34	0	0	38	0
Stage 1	34	-	-	-	-	-
Stage 2	127	_	_	<u>-</u>	_	<u>-</u>
Critical Hdwy	6.42	6.22	_	_	4.17	_
	5.42	0.22		-	4.17	
Critical Hdwy Stg 1			-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518		-	-	2.263	-
Pot Cap-1 Maneuver	830	1039	-	-	1541	-
Stage 1	988	-	-	-	-	-
Stage 2	899	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	812	1039	-	-	1541	-
Mov Cap-2 Maneuver	812	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	879	_	_	_	-	_
Jiago Z	317					
Approach	WB		NB		SB	
HCM Control Delay, s	8.9		0		2.6	
HCM LOS	Α					
		NDT	NDE	ND.	0.01	ODT
Minor Lane/Major Mvn	nt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)		-	-	955	1541	-
HCM Lane V/C Ratio		-	-	0.022	0.021	-
HCM Control Delay (s)	-	-	8.9	7.4	0
HCM Lane LOS		-	-	Α	Α	Α
HCM 95th %tile Q(veh	1)	-	_	0.1	0.1	-
	,			0.1	311	

Interception												
Intersection Int Delay, s/veh	0.4											
											055	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			Φ₽			⋪∌	
Traffic Vol, veh/h	6	0	25	0	0	0	30	952	0	0	916	5
Future Vol, veh/h	6	0	25	0	0	0	30	952	0	0	916	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage	e,# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	11	2	4	2	2	2	2	4	2	2	6	2
Mvmt Flow	7	0	27	0	0	0	33	1035	0	0	996	5
Major/Minor N	Minor2		ľ	Minor1		N	/lajor1		N	/lajor2		
Conflicting Flow All	1583	2100	501	1599	2102	518	1001	0	0	1035	0	0
Stage 1	999	999	-	1101	1101	-	-	-	-	-	-	-
Stage 2	584	1101	_	498	1001	_	_	_		_	_	_
Critical Hdwy	7.72	6.54	6.98	7.54	6.54	6.94	4.14			4.14		
Critical Hdwy Stg 1	6.72	5.54	0.70	6.54	5.54	0.74	4.14	_		4.14	_	
Critical Hdwy Stg 2	6.72	5.54	-	6.54	5.54	-	_	-	_	_	-	-
Follow-up Hdwy	3.61	4.02	3.34	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	67	51	510	71	51	502	687	-	-	667	-	-
•	245	319	510	226	286	502	007	-	-	007	-	-
Stage 1	443					-	-	-	-	-	-	-
Stage 2	443	286	-	523	319	-	-	-	-	-	-	-
Platoon blocked, %	/ [40	E10	/ [40	EVO	407	-	-	4/7	-	-
Mov Cap-1 Maneuver	65	49	510	65	49	502	687	-	-	667	-	-
Mov Cap-2 Maneuver	164	156	-	65	49	-	-	-	-	-	-	-
Stage 1	233	319	-	215	272	-	-	-	-	-	-	-
Stage 2	422	272	-	495	319	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	16			0			0.3			0		
HCM LOS	С			Α								
Minor Lane/Major Mvm	nt	NBL	NBT	NBR E	EBLn1V	VBL _{n1}	SBL	SBT	SBR			
Capacity (veh/h)		687	_	_	362	-	667	-	_			
HCM Lane V/C Ratio		0.047	_	_	0.093	_	-	_	_			
HCM Control Delay (s)		10.5	-	-	16	0	0	-	-			
HCM Lane LOS		В	_	_	С	A	A	_	_			
HCM 95th %tile Q(veh))	0.1	_	_	0.3	-	0	_	_			
HOW FORM FORME CELVERY	/	0.1			0.5	_	U					

Intersection						
Int Delay, s/veh	3.6					
		EDD	MDI	MOT	NIDI	NDD
	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	₽			4	À	
Traffic Vol, veh/h	12	16	1	14	25	4
Future Vol, veh/h	12	16	1	14	25	4
Conflicting Peds, #/hr	0	0	0	0	0	0
	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	2	2	2	2	2
Mymt Flow	13	17	1	15	27	4
IVIVIIIL F IUW	13	17		13	21	4
Major/Minor Ma	ajor1	ľ	Major2	1	Minor1	
Conflicting Flow All	0	0	30	0	39	22
Stage 1	-	-	-	-	22	-
Stage 2	-		-	-	17	-
Critical Hdwy	_	-	4.12	-	6.42	6.22
,		-				
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	
Pot Cap-1 Maneuver	-	-	1583	-	973	1055
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	972	1055
Mov Cap-2 Maneuver	-	-	-	-	972	-
Stage 1	-	-	-	-	1001	_
Stage 2	_	_	_	_	1005	_
Jiago Z					1000	
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		8.8	
HCM LOS	-				A	
					, \	
Minor Lane/Major Mvmt	N	VBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		983	-	-	1583	-
HCM Lane V/C Ratio		0.032	-		0.001	-
HCM Control Delay (s)		8.8	-	-	7.3	0
HCM Lane LOS		A	_	_	Α	A
HCM 95th %tile Q(veh)		0.1			0	-
How 75th 70the Q(veh)		0.1	_	-	U	

Intersection						
Int Delay, s/veh	2.2					
	WDI	WDD	NDT	NDD	CDI	CDT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		ĵ.			4
Traffic Vol, veh/h	9	26	94	6	17	54
Future Vol, veh/h	9	26	94	6	17	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e, # 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	6	2
Mvmt Flow	10	28	102	7	18	59
WWW. Tiow	10	20	102	•	10	07
Major/Minor	Minor1	N	/lajor1	1	Major2	
Conflicting Flow All	201	106	0	0	109	0
Stage 1	106	-	-	-	-	-
Stage 2	95	-	-	-	-	-
Critical Hdwy	6.42	6.22	_	-	4.16	_
Critical Hdwy Stg 1	5.42	-	_	_	-	_
Critical Hdwy Stg 2	5.42	_	_	_	_	_
Follow-up Hdwy	3.518		_	_	2.254	_
Pot Cap-1 Maneuver	788	948	_		1457	_
	918			-	1437	
Stage 1		-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	778	948	-	-	1457	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Annroach	MD		ND		CD	
Approach	WB		NB		SB	
HCM Control Delay, s	9.2		0		1.8	
HCM LOS	Α					
Minor Lane/Major Mvn	nt	NBT	MRRV	VBLn1	SBL	SBT
	п	INDI	ואוטווו			301
Capacity (veh/h)		-	-		1457	-
HCM Lane V/C Ratio		-	-	0.042		-
HCM Control Delay (s))	-	-	9.2	7.5	0
HCM Lane LOS		-	-	Α	Α	Α
HCM 95th %tile Q(veh	1)	-	-	0.1	0	-

2026 No-Build Conditions



Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	LDIT	1102	4	TTDIX.	ኘ	†	HEIN	ኘ	†	OBIT
Traffic Vol. veh/h	4	0	35	0	0	0	13	799	0	0	809	1
Future Vol, veh/h	4	0	35	0	0	0	13	799	0	0	809	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	_	_	-	_	-	-	100	_	-	100	-	-
Veh in Median Storage	.# -	1	-	-	0	_	-	0	_	-	0	_
Grade, %	-	0	-	_	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	10	2	2	2	2	9	2	2	7	2
Mvmt Flow	4	0	38	0	0	0	14	868	0	0	879	1
Major/Minor N	Minor2		ľ	Minor1		N	/lajor1		N	/lajor2		
Conflicting Flow All	1342	1776	440	1336	1776	434	880	0	0	868	0	0
Stage 1	880	880	-	896	896	-	-	-	-	-	-	-
Stage 2	462	896	_	440	880	-	-	_	-	_	-	_
Critical Hdwy	7.54	6.54	7.1	7.54	6.54	6.94	4.14	-	-	4.14	_	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	_	-	-	_
Critical Hdwy Stg 2	6.54	5.54	_	6.54	5.54	_	-	_	-	-	_	-
Follow-up Hdwy	3.52	4.02	3.4	3.52	4.02	3.32	2.22	_	_	2.22	_	-
Pot Cap-1 Maneuver	110	82	543	112	82	570	764	_	-	772	_	-
Stage 1	308	363	-	301	357	-	-	-	-	-	-	-
Stage 2	549	357	_	566	363	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	81	543	103	81	570	764	-	-	772	-	-
Mov Cap-2 Maneuver	221	200	-	103	81	-	-	-	-	_	-	_
Stage 1	302	363	-	296	351	-	-	-	-	-	-	-
Stage 2	539	351	-	526	363	-	-	-	-	-	-	-
J -												
Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.4			0			0.2			0		
HCM LOS	В			A								
Minor Lane/Major Mvm	t	NBL	NBT	NBR I	EBLn1V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		764	-	-	472	-	772	-	-			
HCM Lane V/C Ratio		0.018	_	_	0.09	_		_	_			
HCM Control Delay (s)		9.8	-	_	13.4	0	0	_	_			
HCM Lane LOS		A	_	_	В	A	A	_	_			
HCM 95th %tile Q(veh)		0.1	_	_	0.3	-	0	_	_			
		V .,			3.5		_					

Intersection						
Int Delay, s/veh	2.2					
		EDD	WDI	WDT	NDI	MDD
	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	}	0.1	•	-4	¥	
Traffic Vol, veh/h	12	26	0	11	12	4
Future Vol, veh/h	12	26	0	11	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0
	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	2	2	2	50
Mvmt Flow	13	28	0	12	13	4
N A = 1 = 1/N A1 = = 1	. ! 4		1-1-0		A! 4	
	ajor1		Major2		Minor1	
Conflicting Flow All	0	0	41	0	39	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	12	-
Critical Hdwy	-	-	4.12	-	6.42	6.7
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.75
Pot Cap-1 Maneuver	-	-	1568	-	973	926
Stage 1	-	-	-	_	996	_
Stage 2	_	_	_	_	1011	_
Platoon blocked, %	_	_		_	1011	
Mov Cap-1 Maneuver	_	_	1568	_	973	926
Mov Cap-1 Maneuver			1300	_	973	720
	-	-				
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	1011	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		8.8	
HCM LOS	U		- 0		Α	
HOW LOS					٨	
Minor Lane/Major Mvmt		VBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		961	-	-	1568	-
HCM Lane V/C Ratio		0.018	-		-	
HCM Control Delay (s)		8.8	-	-	0	-
HCM Lane LOS		A	_	_	A	_
HCM 95th %tile Q(veh)		0.1	_	_	0	_
HOW 75th 70th Q(VCH)		0.1			U	_

Intersection						
Int Delay, s/veh	2.8					
Movement	\M/DI	WPD	NBT	NBR	SBL	SBT
	WBL	WBR		NDK	SDL	
Lane Configurations	Y	1.4	♣	0	22	ન
Traffic Vol, veh/h	7	14	30	9	33	61
Future Vol, veh/h	7	14	30	9	33	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e, # 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	7	2
Mymt Flow	8	15	33	10	36	66
IVIVIIIL I IOW	U	13	33	10	30	00
Major/Minor	Minor1	N	/lajor1	ſ	Major2	
Conflicting Flow All	176	38	0	0	43	0
Stage 1	38	-	-	-	-	-
Stage 2	138	_	-	_	_	_
Critical Hdwy	6.42	6.22	_	_	4.17	_
Critical Hdwy Stg 1	5.42	-	_	_	- 1.17	_
Critical Hdwy Stg 2	5.42	_	_	_	-	_
		3.318			2.263	
Follow-up Hdwy			-			-
Pot Cap-1 Maneuver	814	1034	-	-	1534	-
Stage 1	984	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	794	1034	-	-	1534	-
Mov Cap-2 Maneuver	794	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	868	-	-	_	-	
Jiago Z	300					
Approach	WB		NB		SB	
HCM Control Delay, s	8.9		0		2.6	
HCM LOS	Α					
Minor Long /Main 24		NDT	NDDV	VDI 1	CDI	CDT
Minor Lane/Major Mvn	<u> 1</u>	NBT	NRKA	VBLn1	SBL	SBT
Capacity (veh/h)		-	-		1534	-
HCM Lane V/C Ratio		-		0.024	0.023	-
HCM Control Delay (s))	-	-	8.9	7.4	0
HCM Lane LOS		-	-	Α	Α	Α
HCM 95th %tile Q(veh)	_	_	0.1	0.1	_
	,			3.1	J. 1	

Intersection												
Int Delay, s/veh	0.4											
-		CDT	EDD.	WDL	WET	WED	NDI	NDT	NIDD	CDI	CDT	CDD
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	♣	27	0	- ♣	0	<u>ነ</u>	↑ }	^	<u>ነ</u>	†	
Traffic Vol, veh/h	7	0	27	0	0	0	33	1045	0	0	1005	5
Future Vol, veh/h	7	0	27	0	0	0	33	1045	0	0	1005	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	100	-	None	100	-	None
Storage Length	-	1	-	-	0	-	100	-	-		0	-
Veh in Median Storage		0	-	-		-	-	0	-	-	0	-
Grade, %	92	92	92	92	92	- 02	92	92	92	92	92	- 02
Peak Hour Factor	92 11	92		2	92	92 2	92	92 4	92	92		92 2
Heavy Vehicles, % Mvmt Flow	8	0	4 29	0	0	0	36	1136	0	0	6 1092	5
IVIVIIIL FIOW	Ŏ	U	29	U	U	U	30	1130	U	U	1092	5
Major/Minor N	Minor2		N	Minor1		N	Major1		N	/lajor2		
Conflicting Flow All	1735	2303	549	1754	2305	568	1097	0	0	1136	0	0
Stage 1	1095	1095	-	1208	1208	-	-	-	-	-	-	-
Stage 2	640	1208	-	546	1097	-	-	-	-	-	-	-
Critical Hdwy	7.72	6.54	6.98	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.72	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.61	4.02	3.34	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	51	38	474	54	38	466	632	-	-	611	-	-
Stage 1	213	288	-	194	254	-	-	-	-	-	-	-
Stage 2	409	254	-	490	287	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	49	36	474	48	36	466	632	-	-	611	-	-
Mov Cap-2 Maneuver	140	136	-	48	36	-	-	-	-	-	-	-
Stage 1	201	288	-	183	240	-	-	-	-	-	-	-
Stage 2	386	240	-	460	287	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
	17.8			0			0.3			0		
HCM LOS	C			A			3.0					
110.11 200	<u> </u>			,,								
Minor Lane/Major Mvm	nt	NBL	NBT	NIPD	EBLn1V	MRI n1	SBL	SBT	SBR			
	It		NDT	ואטויו				301	אטכ			
Capacity (veh/h)		632	-	-	318	-	611	-	-			
HCM Central Delay (a)		0.057	-		0.116	-	-	-	-			
HCM Long LOS		11	-	-	17.8	0	0	-	-			
HCM Lane LOS	١	В	-	-	C	Α	A	-	-			
HCM 95th %tile Q(veh))	0.2	-	-	0.4	-	0	-	-			

Intersection						
Int Delay, s/veh	3.6					
		===	11/51	11/5=		NES
	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	₽			- 4	W	
Traffic Vol, veh/h	13	18	1	15	27	4
Future Vol, veh/h	13	18	1	15	27	4
Conflicting Peds, #/hr	0	0	0	0	0	0
	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	-
Grade, %	0	_	_	0	0	_
Peak Hour Factor	92	92	92	92	92	92
	5	2	2	2	2	2
Heavy Vehicles, %						
Mvmt Flow	14	20	1	16	29	4
Major/Minor Ma	ajor1	N	Major2	- 1	Minor1	
	0		34		42	24
Conflicting Flow All		0		0		
Stage 1	-	-	-	-	24	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1578	-	969	1052
Stage 1	-	-	-	-	999	-
Stage 2	-	-	_	-	1005	_
Platoon blocked, %	_	_		_	. 505	
Mov Cap-1 Maneuver	_		1578	_	968	1052
		_	1370		968	1032
Mov Cap-2 Maneuver	-	-		-		
Stage 1	-	-	-	-	999	-
Stage 2	-	-	-	-	1004	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		8.8	
HCM LOS					Α	
Minor Lane/Major Mvmt	N	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		978	-		1578	-
HCM Cantrol Dalace (2)		0.034	-	-	0.001	-
HCM Control Delay (s)		8.8	-	-	7.3	0
HCM Lane LOS		Α	-	-	Α	Α
HCM 95th %tile Q(veh)		0.1	-	-	0	-

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
	WDL	NOK		NDK	JDL	
Lane Configurations		20	102	7	10	4
Traffic Vol, veh/h	10	29	103	7	19	59 50
Future Vol, veh/h	10	29	103	7	19	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e,# 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	6	2
Mvmt Flow	11	32	112	8	21	64
D.A. 1. /D.A.	N A1			_		
	Minor1		/lajor1		Major2	
Conflicting Flow All	222	116	0	0	120	0
Stage 1	116	-	-	-	-	-
Stage 2	106	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.16	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy		3.318	-	-	2.254	-
Pot Cap-1 Maneuver	766	936	_	_	1443	_
Stage 1	909	-	_	_	-	
Stage 2	918		-	-	-	
Platoon blocked, %	710	-				-
	755	027	-	-	1//2	
Mov Cap-1 Maneuver	755	936	-	-	1443	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	9.3		0		1.8	
HCM LOS			U		1.0	
IICIVI LUS	А					
Minor Lane/Major Mvn	nt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)		_			1443	_
HCM Lane V/C Ratio		_		0.048		
HCM Control Delay (s)		_	9.3	7.5	0
HCM Lane LOS		-	-	7.3 A	7.5 A	A
HCM 95th %tile Q(veh	,)		-	0.2	0	
UCM ADM WING MICK MICK	IJ	-	-	0.2	U	-

2026 Build Conditions



Intersection												
Int Delay, s/veh	0.5											
		EDT	EDD	MO	WOT	MDD	ND	NDT	NIDD	051	ODT	000
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_	4			4			∱ }		7	↑ ↑	
Traffic Vol, veh/h	5	0	48	0	0	0	20	799	0	0	809	2
Future Vol, veh/h	5	0	48	0	0	0	20	799	0	0	809	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	_ 0	0	_ 0	0	0
	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage,	# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	10	2	2	2	2	9	2	2	7	2
Mvmt Flow	5	0	52	0	0	0	22	868	0	0	879	2
Major/Minor Mi	inor2		N	/linor1		N	Najor1			/lajor2		
	1358	1792	441	1352	1793	434	881	0	0	868	0	0
Stage 1	880	880	-	912	912	-		-	-	-	-	-
Stage 2	478	912	_	440	881	-	-	-	-	_	-	-
	7.54	6.54	7.1	7.54	6.54	6.94	4.14	-	-	4.14	_	-
	6.54	5.54	-	6.54	5.54	-	-	-	-		-	_
	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
3 0	3.52	4.02	3.4	3.52	4.02	3.32	2.22	_	-	2.22	_	_
Pot Cap-1 Maneuver	107	80	543	109	80	570	763	-	-	772	_	-
Stage 1	308	363	-	295	351	-	- 30	_	_		_	_
Stage 2	537	351	_	566	363	_	-	_	_	_	_	_
Platoon blocked, %	007	001		- 500	- 500			_	_		_	-
Mov Cap-1 Maneuver	105	78	543	96	78	570	763	_	-	772	_	-
Mov Cap-2 Maneuver	217	196	-	96	78	-	- 30	_	_		_	_
Stage 1	299	363	-	286	341	_	-	_	-	_	_	-
Stage 2	522	341	_	512	363	_	-	_	_	_	_	_
5.ag5 L		J 11		, i =	300							
Annroach	EB			WB			NB			SB		
Approach							0.2					
3	13.6			0			0.2			U		
HCM LOS	В			Α								
Minor Lane/Major Mvmt		NBL	NBT	NBR I	EBLn1V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		763	-	-	476	-	772	-	-			
HCM Lane V/C Ratio		0.028	-	-	0.121	-	-	-	-			
HCM Control Delay (s)							_					
ricivi contitol Delay (3)		9.9	-	-	13.6	0	0	-				
HCM Lane LOS		9.9 A	-	-	13.6 B	0 A	0 A	-	-			

Intersection						
Int Delay, s/veh	3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
		WUK		NDK	SDL	
Lane Configurations	¥	1/	}	0	2.4	ર્ ન
Traffic Vol, veh/h	8	16	30	9	34	61
Future Vol, veh/h	8	16	30	9	34	61
Conflicting Peds, #/hr	0	0	0	0	0	_ 0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e, # 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	7	2
Mvmt Flow	9	17	33	10	37	66
IVIVIIIL I IOW	7	17	33	10	31	00
Major/Minor I	Vinor1	N	/lajor1	I	Major2	
Conflicting Flow All	178	38	0	0	43	0
Stage 1	38	-	-	-	7.0	-
Stage 2	140	- ())	-	-	117	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518		-	-	2.263	-
Pot Cap-1 Maneuver	812	1034	-	-	1534	-
Stage 1	984	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Platoon blocked, %			_	_		_
Mov Cap-1 Maneuver	792	1034	_	-	1534	_
Mov Cap-1 Maneuver	792	1034	-		1007	_
	984			-	-	
Stage 1		-	-	-	-	-
Stage 2	865	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	8.9		0		2.7	
HCM LOS	Α					
Minor Lane/Major Mvm	nt	NBT	NIRDV	VBLn1	SBL	SBT
	IC	INDT	אטוו			ומכ
Capacity (veh/h)		-	-	938	1534	-
HCM Lane V/C Ratio		-	-	0.028		-
HCM Control Delay (s)		-	-	8.9	7.4	0
HCM Lane LOS		-	-	Α	Α	Α
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection						
Int Delay, s/veh	4.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	<u>₽</u>	LDK	WDL	₩DI 4	INDL	NOR
Traffic Vol, veh/h	12	3	7	H 11	-T -	14
Future Vol, veh/h	12	3	7	11	7	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	Stop -	
Storage Length	-	NOTIC -	_	None -	0	NONE -
Veh in Median Storage,		_	_	0	0	-
Grade, %	0	- 02	- 02	0	0	- 02
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	3	8	12	8	15
Major/Minor N	lajor1	ľ	Major2	- 1	Minor1	
Conflicting Flow All	0	0	16	0	43	15
Stage 1	-	-	-	-	15	-
Stage 2	_	_	_	_	28	_
Critical Hdwy	_	-	4.12	_	6.42	6.22
Critical Hdwy Stg 1	_		4.12	_	5.42	0.22
Critical Hdwy Stg 2	_	-	-	_	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	
Pot Cap-1 Maneuver	-	-	1602	-	968	1065
		-		-	1008	
Stage 1	-	-	-	-		-
Stage 2	-	-	-	-	995	-
Platoon blocked, %	-	-	1/00	-	0/0	10/5
Mov Cap-1 Maneuver	-	-	1602	-	963	1065
Mov Cap-2 Maneuver	-	-	-	-	963	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	990	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.8		8.6	
HCM LOS	U		2.0		Α	
TIGIVI EUS					А	
Minor Lane/Major Mvmt	1	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		1029	-	-	1602	-
HCM Lane V/C Ratio		0.022	-		0.005	-
HCM Control Delay (s)		8.6	-	-	7.3	0
HCM Lane LOS		Α	-	-	A	A
HCM 95th %tile Q(veh)		0.1	-	-	0	-
2(1011)						

Intersection												
Intersection Int Delay, s/veh	0.6											
-												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			∱ ⊅		- ሽ	Λ₽	
Traffic Vol, veh/h	8	0	35	0	0	0	45	1045	0	0	1005	6
Future Vol, veh/h	8	0	35	0	0	0	45	1045	0	0	1005	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage	e,# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	11	2	4	2	2	2	2	4	2	2	6	2
Mvmt Flow	9	0	38	0	0	0	49	1136	0	0	1092	7
Major/Minor N	Minor2		Į.	/linor1			Major1		N	/lajor2		
Conflicting Flow All	1762	2330	550	1780	2333	568	1099	0	0	1136	0	0
Stage 1	1096	1096	-	1234	1234	-		_	_	-	_	_
Stage 2	666	1234	_	546	1099	_	_	_		_	_	_
Critical Hdwy	7.72	6.54	6.98	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.72	5.54	-	6.54	5.54	-	-	_	_	-	_	_
Critical Hdwy Stg 2	6.72	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.61	4.02	3.34	3.52	4.02	3.32	2.22	-	-	2.22	_	_
Pot Cap-1 Maneuver	49	37	474	52	36	466	631	-	-	611	_	-
Stage 1	212	287	_	187	247	-		_	-		_	_
Stage 2	394	247	-	490	287	-	-	-	-	-	-	-
Platoon blocked, %								_	-		_	_
Mov Cap-1 Maneuver	46	34	474	45	33	466	631	-	-	611	-	-
Mov Cap-2 Maneuver	135	131	- ' -	45	33	-		-	-		_	_
Stage 1	195	287	-	172	228	-	-	-	-	-	-	-
Stage 2	363	228	-	451	287	-	-	-	-	-	-	-
g												
Approach	EB			WB			NB			SB		
HCM Control Delay, s	18			0			0.5			0		
HCM LOS	C			A			0.0			- 0		
TOW LOO	U											
Minor Lane/Major Mvm	nt	NBL	NBT	MRRI	EBLn1V	VRI n1	SBL	SBT	SBR			
Capacity (veh/h)		631	IVDI	ואטוו	323	VDLIII -	611	301	JUIN			
HCM Lane V/C Ratio		0.078	-	-	0.145		UII	-	-			
HCM Control Delay (s)		11.2	-	-	18	-	0	-	-			
HCM Lane LOS			-	-		0		-	-			
	١	В	-	-	С	А	A	-	-			
HCM 95th %tile Q(veh)	0.3	-	-	0.5	-	0	-	-			

Intersection						
Int Delay, s/veh	3.6					
		===	11/51	11/5-		MES
	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	₽			- 4	W	
Traffic Vol, veh/h	17	18	2	17	27	8
Future Vol, veh/h	17	18	2	17	27	8
Conflicting Peds, #/hr	0	0	0	0	0	0
	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	_
Grade, %	0	_	_	0	0	_
Peak Hour Factor	92	92	92	92	92	92
	5	2	2	2	2	2
Heavy Vehicles, %						
Mvmt Flow	18	20	2	18	29	9
Major/Minor Ma	ajor1	N	Major2	ı	Minor1	
Conflicting Flow All	0	0	38	0	50	28
		U				
Stage 1	-	-	-	-	28	-
Stage 2	-	-	-	-	22	- (00
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1572	-	959	1047
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1001	_
Platoon blocked, %	_	_		_	.501	
Mov Cap-1 Maneuver	_	_	1572	_	958	1047
		_	1372		958	1047
Mov Cap-2 Maneuver	-	-		-		
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1000	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		8.8	
HCM LOS					Α	
Minor Lane/Major Mvmt	N	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		977	-		1572	-
HCM Cartest Dates (2)		0.039	-	-	0.001	-
HCM Control Delay (s)		8.8	-	-	7.3	0
HCM Lane LOS		Α	-	-	Α	Α
HCM 95th %tile Q(veh)		0.1	-	-	0	-

Intersection Int Delay, s/veh 2.4 Movement WBL WBR NBT NBR SBL SBT Lane Configurations Traffic Vol, veh/h 11 31 103 8 21 59
Int Delay, s/veh 2.4 Movement WBL WBR NBT NBR SBL SBT Lane Configurations Traffic Vol, veh/h 11 31 103 8 21 59
MovementWBLWBRNBTNBRSBLSBTLane ConfigurationsYIIITraffic Vol, veh/h113110382159
Lane Configurations Y
Traffic Vol, veh/h 11 31 103 8 21 59
Future Vol, veh/h 11 31 103 8 21 59
Conflicting Peds, #/hr 0 0 0 0 0 0
Sign Control Stop Stop Free Free Free Free
RT Channelized - None - None - None
Storage Length 0
Veh in Median Storage, # 0 - 0 0
Grade, % 0 - 0 0
Peak Hour Factor 92 92 92 92 92 92
Heavy Vehicles, % 2 2 2 6 2
Mvmt Flow 12 34 112 9 23 64
12 01 112 7 20 01
Major/Minor Minor1 Major1 Major2
Conflicting Flow All 227 117 0 0 121 0
Stage 1 117
Stage 2 110
Critical Hdwy 6.42 6.22 4.16 -
Critical Hdwy Stg 1 5.42
Critical Hdwy Stg 2 5.42
Follow-up Hdwy 3.518 3.318 2.254 -
Pot Cap-1 Maneuver 761 935 1442 -
Stage 1 908
<u> </u>
5
Platoon blocked, %
Mov Cap-1 Maneuver 748 935 1442 -
Mov Cap-2 Maneuver 748
Stage 1 908
Stage 2 899
Approach WB NB SB
ADDITUACIT VVD INB SB
HCM Control Delay, s 9.3 0 2
HCM Control Delay, s 9.3 0 2
HCM Control Delay, s 9.3 0 2 HCM LOS A
HCM Control Delay, s 9.3 0 2 HCM LOS A Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT
HCM Control Delay, s 9.3 0 2 HCM LOS A Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT Capacity (veh/h) - 878 1442 -
HCM Control Delay, s 9.3 0 2
HCM Control Delay, s 9.3 0 2 HCM LOS A Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT Capacity (veh/h) - 878 1442 - HCM Lane V/C Ratio - - 0.052 0.016 - HCM Control Delay (s) - 9.3 7.5 0
HCM Control Delay, s 9.3 0 2

Intersection						
Int Delay, s/veh	3.6					
	EBT	EBR	WBL	WBT	NBL	NBR
Movement Lane Configurations		EBK	WBL		INBL	NRK
Lane Configurations Traffic Vol, veh/h	}	7	11	€ 15		10
· · · · · · · · · · · · · · · · · · ·	13	7	14	15	5	10
Future Vol, veh/h	13	7	14	15	5	10
Conflicting Peds, #/hr	0 Free	O Eroo	0 Fron	0 Froo	0 Ctop	0 Stop
3	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,		-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	8	15	16	5	11
Major/Minor Major/Minor	ajor1	N	Major2	J	Minor1	
Conflicting Flow All	0	0	22	0	64	18
Stage 1	-	-	-	-	18	-
Stage 2	_	_	_	_	46	-
Critical Hdwy	_	_	4.12	_	6.42	6.22
Critical Hdwy Stg 1	-	_	-	_	5.42	-
Critical Hdwy Stg 2	_		-		5.42	-
Follow-up Hdwy	_		2.218	_	3.518	
Pot Cap-1 Maneuver	_		1593	-	942	1061
Stage 1	_		10/0	_	1005	-
Stage 2		_		-	976	-
Platoon blocked, %		-	-		7/0	-
	-	-	1502	-	022	1041
Mov Cap-1 Maneuver	-	-	1593	-	933	1061
Mov Cap-2 Maneuver	-	-	-	-	933	-
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	966	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.5		8.6	
HCM LOS	U		0.0		Α	
1.0W E00					, \	
Minor Lang/Major Mumt	N	IDI n1	EDT	EDD	WDI	WDT
Minor Lane/Major Mvmt	ľ	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		1015	-	-	1593	-
HCM Lane V/C Ratio		0.016	-	-	0.01	-
HCM Control Delay (s)		8.6	-	-	7.3	0
HCM Lane LOS		Α	-	-	Α	Α
HCM 95th %tile Q(veh)		0	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					
		WED	NDT	NDD	CDI	CDT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		ĵ»			ની
Traffic Vol, veh/h	2	0	36	2	0	19
Future Vol, veh/h	2	0	36	2	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storag	e,# 0	-	0	-	-	0
Grade, %	0	_	0	_	_	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	39	2	0	21
IVIVIIIL FIOW	Z	U	37	2	U	21
Major/Minor	Minor1	N	Major1	1	Major2	
Conflicting Flow All	61	40	0	0	41	0
Stage 1	40	-	-	-		-
Stage 2	21	_	_	_	_	_
Critical Hdwy	6.42	6.22	_	_	4.12	_
Critical Hdwy Stg 1	5.42	0.22			4.12	
	5.42		-	-		-
Critical Hdwy Stg 2		-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-		2.218	-
Pot Cap-1 Maneuver	945	1031	-	-	1568	-
Stage 1	982	-	-	-	-	-
Stage 2	1002	-	-	-	-	-
Platoon blocked, %				-		-
Mov Cap-1 Maneuver	945	1031	-	-	1568	-
Mov Cap-2 Maneuver	945	-	-	-	-	-
Stage 1	982	-	-	-	_	-
Stage 2	1002	_	_	_	_	_
Olugo Z	1002					
Approach	WB		NB		SB	
HCM Control Delay, s	8.8		0		0	
HCM LOS	Α					
Minor Long/Moior Mur	w.t	NDT	NDDV	VDI 51	CDI	CDT
Minor Lane/Major Mvr	nı	NBT	NRKA	VBLn1	SBL	SBT
Capacity (veh/h)		-	-	945	1568	-
HCM Lane V/C Ratio		-	-	0.002	-	-
HCM Control Delay (s		-	-	8.8	0	-
HCM Lane LOS		-	-	Α	Α	-
HCM 95th %tile Q(vel	۱)	-	-	0	0	-
	•					