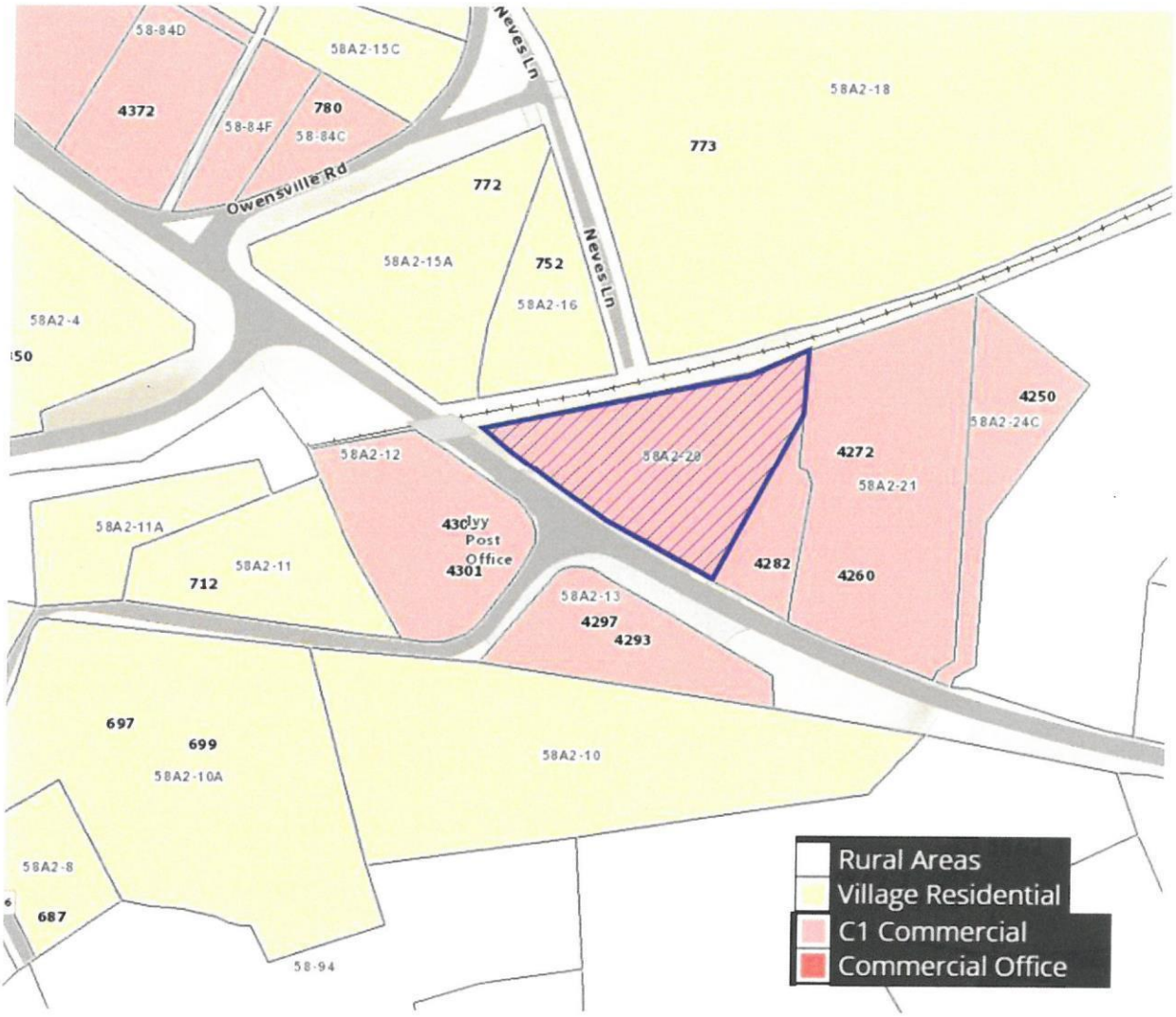
IVY PROPER – WATER CONSUMPTION

PROJECT PROPOSAL

Introduction

Ivy Proper LLC (the "Applicant") is the owner of TMP 58A2-20 (the "Property"). The parcel is currently zoned C-1 but is embedded Albemarle County's Rural Area in the iconic community of Ivy. See Image 1.

Image 1.



The Applicant requests a Special Use Permit for the rights to use 875 gallons per day of groundwater from a private well on the Property. The SUP is required under Chapter 18, Article III, Section 22.2.2.11.a because the ordinance currently limits water consumption for a site not served by public water to 400 gallons per site acre per day. The Property is .87 acres and; therefore, under SDP2021000001, is approved for only 348 gallons per day.

The well was completed on July 7, 2022 and the attached report (Exhibit 1) confirms an approved well 280 feet deep with a static water level at 30 feet with a flow rate of at least 4 gallons per minute. We have included for reference the BTEX inspection for the approved well (Exhibit 2). The Virginia Administrative Code does not specifically mention veterinary hospitals (12VAC5-610-670, Table 5.1) (Exhibit 3); however, The North Carolina Administrative Code does (15A NCAC 02T .0114) (Exhibit 4). Based on their analysis, we estimate 250 gal/practitioner/shift. In our case, the proposed clinic is for a sole practitioner operating on a single shift; therefore, the estimated water use for the vet is 250gpd. The remaining available square footage in the building is unleased as of the date of this memo, but a project tenant mix and associated water usage is represented in the following table:

Use	Gallons	Per	Units	Total GPD
Veterinary*	250	GPD / practitioner	1	250
Office	35	GPD / person	4	140
Food Prep	15	GPD	1	15
Laundering	15	GPD	1	15
PT Office*	250	GPD / practitioner	1	250
Retail	200	SF floor space	1025	205
		TOTAL		**875**
* Not in VAC. Calculations are based on NCAC.				

Factors for Consideration (per 18-33.40)

- **Public Need and Benefit**

Ivy epitomizes one of Albemarle County's rural communities complete with a full-service garage, a U.S. Post Office, a four-season nursery and garden center, and an old motel converted to retail and service-oriented enterprises servicing the community, and, of course, Duner's Restaurant. We propose to add an additional blend to this mix of services.

- **No Substantial Detriment**

The development of the Property has been approved under SDP2021000001. The proposed mix of additional services is a benefit to the community not a detriment.

- **Character of the Nearby Area is Unchanged**

The contemplated mix of uses does not adversely change the character of the proximate uses, which include a service station, a post office, a nursery and garden center, offices, a convenience store, and others.

- **Harmony**

The combination of veterinary hospital, office, food service, and retail is harmonious with other uses designated on the Comprehensive plan as rural areas, especially considering the C-1 zoning.

CONSISTENCY WITH COMPREHENSIVE PLAN

The subject property for this proposal is 58A2-20 located at the intersection of Route 250/Ivy Rd and Ivy Depot Rd, between the railroad and 4282 Ivy Rd, across from the Ivy Store. The Comprehensive Plan recognizes that

"traditional crossroads communities" are an essential and vibrant part of our unique fabric. Ivy's origins as a community village date back to 1826 when it was known as Woodville.

The Rural Area Chapter (Chapter 7) of the Comprehensive Plan designates these parcels for Rural Area land use. The intent of the Rural Area designation is to allow uses that preserve and protect agricultural, forestal, open space, and natural, historic and scenic resources; and also to allow residential uses at a density of up to 0.5 acres per dwelling unit. The proposed uses align with the Rural Area's intent for crossroads communities to provide support services and opportunities to engage in community life (Objective 5). Providing these services are a viable aspect of community life.

While this parcel is zoned C-1 Commercial, it is also located in the Rural Area. The Rural Area Chapter of the Comprehensive Plan states that uses allowed in the RA Zoning District are the uses that are appropriate in the Rural Area. The RA Zoning District (18-10.2.2(18)) includes Veterinary Services and Animal Hospitals as uses permitted by Special Use Permit, while offices, food stores, catering, retail shops, etc. are all by-right uses.

IMPACTS ON PUBLIC FACILITIES AND INFRASTRUCTURE

No impacts to the public sanitary sewer or water infrastructure are proposed. This project will utilize a private well and private septic system. SDP2021000001 includes a septic system with full reserve approved by VDH capable of handling 875 gallons per day. The "Tier 3 Groundwater Assessment" performed by Virginia Groundwater LLC for the Property suggests that natural recharge of groundwater on the site, post-development, is 450 gallons per day while the estimated proportion of daily withdrawal that is consumptive (i.e. not returned to the groundwater on site) is only 43.8 gallons per day (page 8). In summary: "The proposed withdrawal of 875 GPD, of which roughly 844 GPD are returned to the ground as recharge through the drain field, would have no foreseeable impacts on regional groundwater resources in the long term" (*Tier 3 Groundwater Assessment, p. 9).*

The approved SDP2021000001 also included multiple studies with VDOT including a Turn Lane Warrant Analysis, an Access Management Exception Request, and a Design Waiver Request; all related to the current and projected increases in traffic and the location of a shared access between the Property and TMP 058A2-00-00-020A0 to the east. Based on all of these studies and the resultant design modifications, VDOT approved SDP2021000001 on June 8, 2022 satisfied that traffic concerns related to the Property and its use were sufficiently addressed.

IMPACTS ON ENVIRONMENTAL FEATURES

The applicant desires to develop the land in an environmentally conscious way. The site in its current condition is partially covered by asphalt and gravel surface. This owner will make improvements to the management of stormwater runoff. The site's runoff is currently directed towards Ivy Road, where the runoff follows an undefined shallow channel just outside of the pavement. Sediment and gravel generated from the erosive runoff appears to be carried to a nearby inlet, before out-falling directly into Ivy Creek. The approved stormwater management plan will capture the site's stormwater in drainage inlets onsite, pipe it to an underground storage facility, and eventually pipe the water to the existing drainage inlet adjacent to Ivy Road. This approach will greatly reduce the volume of stormwater runoff directed over land towards Ivy Road, and thus mitigate the sediment load spilling into Ivy Creek. Water quality impacts will be achieved via onsite stormwater treatment and though the stormwater nutrient credit purchasing program in the Ivy Nutrient Bank.

EXHIBIT 1

Form GW-2
Revised 8/19/2016
Page 1 of 4

COMMONWEALTH OF VIRGINIA
UNIFORM WATER WELL COMPLETION REPORT

APPROVED

DEQ Well # _____
USGS Local # _____
VDH HDIN # 101-21-0130
VDH PWSID # _____

*Indicates required field or section
**Indicates required field or section, if applicable

1. Contact Information*

Contact:	Name	Address	Phone
Owner	Ivy Proper, LLC	400 Locust Avenue, Ste 3, Charlottesville, VA 22902	
Driller	Foster Well & Pump Co Inc	PO Box 260, Earlysville, VA 22936	434-973-9079
System Provider			

2. Well Location*

Physical Address: Ivy Road		**County/City:** Albemarle	
Subdivision Name:	**Section:**	**Block:**	**Lot:**
Tax Map/GPIN #: 58A2-20 / 58A2-14			
Latitude: N	**Longitude:** W		
Datum Source **Horizontal:** ☐ WGS84 ☐ NAD83 ☐ NAD27			
Lat/Long Source (Check One): ☐ Map ☐ GPS ☐ PPDGPS ☐ Survey ☐ Imagery ☐ WAAS			
Location Information Collected By :			
Physical Location Description:			

3. Facility & Use*

Type of Facility (Check One):	Type of Use (Check All That Apply):		
☑ Private	☑ Drinking/Domestic Use	☐ Agricultural	☐ Food Processing
☐ Waterworks	☐ Manufacturing	☐ Irrigation	☐ Injection
☐ Observation/Monitoring Well	☐ Geothermal (Cooling/Heating) ☐ Closed ☐ Open: ☐ Returned to Surface ☐ Returned to Aquifer	☐ Fire Safety	

Received
JUL 26 2022
Charlottesville/Albemarle Health Department
By _____

4. Well Construction*

Well designation, Name or Number:			
Date Started: 7/6/2022	**Date Completed:** 7/7/2022	**Type Rig:** Air Rotary	
Class Well (Check One): ☐ I ☐ IIA ☐ IIB ☐ IIIA ☑ IIIB ☐ IIIC ☐ IIID ☐ IIIE ☐ IV			
Construction Type (Check One): ☑ New ☐ Existing-Modified: ☐ Well ☐ Pump: Date			
Well Depth: 280 ft.	**Total Hole (borehole) Depth:** 54 ft.	**Depth to Bedrock:** 15 ft.	
Hole Size (Include reamed zones): 10 inches from 0 to 54 ft.		6 Inches from 54 to 280 ft.	
Height of Casing above Land Surface: 2 ft. 0 inches			
Casing Size (I.D.) and Materials: (below)	**Total Depth of Casing:** 56 ft.		
6 1/4 inches from +2 to 54 ft. ☐ infilled	Material PVC SDR 27.6	Weight per ft.	or wall thickness in.
inches from to ft. ☐ infilled	Material	Weight per ft.	or wall thickness in.
inches from to ft. ☐ infilled	Material	Weight per ft.	or wall thickness in.
Screen Size & Mesh:			
inches from to ft. ☐ infilled	Mesh Size	Type	
inches from to ft. ☐ infilled	Mesh Size	Type	
inches from to ft. ☐ infilled	Mesh Size	Type	
Water Zones: from 70 to 71 ft.	from to ft.	from to ft.	
Gravel Pack:			
Size: Type:	from to ft.	Size: Type:	from to ft.

Grout Type: ☑ Bentonite Slurry ☐ Neat Cement ☐ Bentonite pellets/chips ☐ Concrete ☐ Neat Cement (6% bentonite)	from 0 to 50 ft.	**Grouting Method:** Poured from surface; Poured through tremmie pipe; ✓ Pumped from bottom upward	**Type of Seal:** ☐ pitless adapter ☐ sanitary seal
	from to ft.		
Camera Survey: ☐ Yes ☐ No		**Date Conducted:**	
Additional Well Construction Form Information Attached: ☐ Yes ☐ No			

Form GW-2
Revised 8/19/2016
Page 3 of 4

COMMONWEALTH OF VIRGINIA
UNIFORM WATER WELL COMPLETION REPORT

DEQ Well # _____
USGS Local # _____
VDH HDIN # 101-21-0130
VDH PWSID # _____

*Indicates required field or section
**Indicates required field or section, if applicable

10. Driller's Log (Use additional sheets if necessary)*

Well designation, Name or Number:

Depth (feet)		Type of Rock or Soil	Remarks	Drilling Time (Min.)	Diagram of Well Construction (with dimensions)
From	To	(Color, material, fossils, hardness, etc.)	(Water, caving, cavities, etc.)		
0	15	red clay, brown schist, brown sandy schist soil, broken-up rock, water, hard gray rock			
15	54	hard gray rock	set casing		
54	70	hard gray rock, quartz			
70	71	broken-up brownstone	water		
71	280	hard gray rock, quartz			

11. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Signature*: James R Holt LSO Date: 7/7/2022

License Number: 2719000250 / James R Holt

EXHIBIT 2

Analytics Corporation
10329 Stony Run Lane
Ashland, VA 23005
Phone: (804) 365-3000
Fax: (804) 365-3002

August 08, 2022

RICK AMARAL
FRANK SAUL CONSTRUCTION
943 PRESTON AVE
#5
Charlottesville, VA 22903

Account ID:
Purchase Order:
Client ID: IVY PROPER
Work Order: 1060335

Dear RICK AMARAL

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, August 04, 2022. The signature below certifies that the results are based on the referenced methods and applicable certifications or accreditations are noted for each parameter reported (see key at end of report).

Unless otherwise specified all analyses of solid materials are based on dry weight.

Reported results relate only to the items tested, as received by the laboratory.

On-site analysis (analysis ASAP) is recommended for the following tests: pH, temperature, dissolved oxygen, residual chlorine and sulfite. When performed off-site, these tests do not meet NELAC standards.

Abbreviations:ug/L = micrograms per Liter, mg/L = milligrams per Liter, ug/g = micrograms per gram, mg/kg = milligrams per kilogram ug/wp = micrograms per wipe, ug/ml = micrograms per millimeter, uS/cm = microsiemens per centimeter at 25 degrees Celcius ppb = parts per billion, DF = Dilution Factor.

If you have any questions concerning this report, please feel free to call Client Services at 1-800-888-8061.

Sincerely,

Dawn A. Casto

Dawn Casto
Technical Director (or designee)

Enclosures

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Analytics Corporation

Analytics Corporation
10329 Stony Run Lane
Ashland, VA 23005
Phone: (804) 365-3000
Fax: (908) 365-3002

ANALYTICAL RESULTS

Workorder: 1060335 IVY PROPER

Lab ID: **1060335001** Date Received: 08/04/2022 16:21 Matrix Drinking Water
Sample ID: **1** Date Collected: 08/04/2022 7:00 Sample Type: GRAB

Parameters	Results	Units	LOQ	DF	Prepared	By	Analyzed	By	Qual	Certifications
Analytical Method: EPA 524.2										
Benzene	<5.00	ug/L	5.00	1	NA	NA	8/5/2022	13:38 DAC		V
Ethylbenzene	<2.00	ug/L	2.00	1	NA	NA	8/5/2022	13:38 DAC		V
m & p-xylene	<4.00	ug/L	4.00	1	NA	NA	8/5/2022	13:38 DAC		
o-Xylene	<2.00	ug/L	2.00	1	NA	NA	8/5/2022	13:38 DAC		
Toluene	<2.00	ug/L	2.00	1	NA	NA	8/5/2022	13:38 DAC		V

CERTIFICATE OF ANALYSIS

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Analytics Corporation
10329 Stony Run Lane
Ashland, VA 23005
Phone: (804) 365-3000
Fax: (908) 365-3002

ANALYTICAL RESULTS

Workorder: 1060335 IVY PROPER

Qualifiers

--

Certification Index:

V = Virginia (NELAC) - 1 VAC 30-46 H 1, Laboratory ID: 460160, Certificate #: 11815

CERTIFICATE OF ANALYSIS

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ACCOUNT NAME AND ADDRESS

Frank Saul Construction
943 Preston Ave, # 5
Charlottesville, VA 22903

OF SAMPLES: 3

PROJECT OR: Ivy Proper

PURCHASE ORDER NO.:

CONTACT: Rick Amaral

TELEPHONE NUMBER: 804 308 4154

RUSH ANALYSIS
- ☐ Same Day
- ☐ One Day
- ☐ Two Day
- ☐ Three Day

Extra Charge

E-MAIL ADDRESS: RAMARAL@franksaulconstruction.com

SPECIAL INSTRUCTIONS:
BTEX for Albemarle County
AMEX - 3767 411070 42025, 09/26

ANALYTICS
10329 Stony Run Lane
Ashland, VA 23005
Phone (804) 365-3000
Toll Free (800) 888-8061
Fax (804) 365-3002

CHAIN OF CUSTODY RECORD

MATRIX CODES

A = AQUEOUS O = OIL
S = SOLID X = OTHER
DW = DRINKING WATER W = WIPES

ANALYSIS REQUESTED (Place an "X" in the box below to indicate request)

Temperature on Arrival: 19.0 °C

Received on Ice: ☑ Yes ☐ No

Lab ID	Sample Identification	Date & Time	MATRIX	# of Bottles	Grab / Comp.	BTEX (well water)	Preservative: None	H_2SO_4	HCl	HNO_3	NaOH	Other	COMMENTS
	1	08/04, 7Am	DW	3	G								

SAMPLED BY (PRINT NAME):

SAMPLED BY (SIGNATURE TO INITIATE COC):

DATE:

TIME:

SAMPLES RELINQUISHED BY: (SIGNATURE)	DATE	TIME	CONDITION	SAMPLES RECEIVED BY: (SIGNATURE)	DATE	TIME	CONDITION
	08/04	4:21		COLLIN WOODWARD	8/4/24	16:21	intact

ENVCOC-01 (REV. 4/2012)

RETAIN BACK COPY FOR PERSONAL RECORDS

ANALYTICS

Sample Container Receipt Form

Version 6-24-2011

Work Order: 1060335

Customer Name: ANALYTICS CORPORATION MIS

CLIENT SAMPLE ID	LAB CONTAINER ID	TYPE OF CONTAINER	QTY	Temp(C)	pH	Chlorine on Arrival (ppm)	Condition Code	Preservative
1	1060335001-C	40MLG	1	19.1		NA	WM	HCL
1	1060335001-A	40MLG	1	19.1		NA	WM	HCL
1	1060335001-B	40MLG	1	19.1		NA	WM	HCL

Notes COLLIN WOODWARD

Sample Custodian Signature cl **Date:** 8/5/21

Condition Code Defination

WM	Received out of </= 6 C range

EXHIBIT 3

Virginia Administrative Code
Title 12. Health
Agency 5. Department of Health
Chapter 610. Sewage Handling and Disposal Regulations

Part V. Design and Construction Criteria

Article 1. General Requirements

12VAC5-610-670. Sewage flows.

Subsurface soil absorption systems shall be designed on the basis of the sewage flows tabulated in Table 5.1.

Table 5.1.
Sewage Flows.

Discharge Facility	Design Unit	Flow (gpd)	BOD (#/day)	S.S. (#/day)	Flow Duration (Hour)
Dwelling[1]	per person total	75	0.2	0.2	24
Food preparation	--	15	--	--	--
Toilet facilities	--	20	--	--	--
Bathing facilities	--	20	--	--	--
Handwashing facilities	--	5	--	--	--
Laundering	--	15	--	--	--
Schools with shower and cafeteria	per person	16	0.04	0.04	8
Schools without showers and with or without cafeteria	per person	10	0.025	0.025	8

Boarding schools	per person	75	0.2	0.2	16
Motels at 65 gals/ person (rooms only)	per person	130	0.26	0.26	24
Trailer courts	per person	75	0.2	0.2	24
Restaurants	per seat	50	0.2	0.2	16
Interstate or through highway restaurants	per seat	100-180	0.7	0.7	16
Interstate rest areas	per person	5	0.01	0.01	24
Service stations	per vehicle served	10	0.01	0.01	16
Factories & office buildings	per person per 8-hr shift	15-35	0.03-0.07	0.03-0.07	operating period
Shopping centers	per 1,000 ft. of ultimate floor space	200-300	0.1	0.1	12
Hospitals	per bed	300	0.6	0.6	24
Nursing homes	per bed	200	0.3	0.3	24
Homes for the aged	per bed	100	0.2	0.2	24
Doctor's office in medical center	per 1,000 sq. ft.	500	0.1	0.1	12
Laundromats, 9 to 12# machines	per machine	500	0.3	0.03	16
Community	per student	15	0.03	0.03	12

colleges	and faculty				
Swimming pools	per swimmer	10	0.001	0.001	12
Theaters, drive-in type	per car	5	0.01	0.01	4
Theaters, auditorium type	per seat	5	0.01	0.01	12
Picnic areas	per person	5	0.01	0.01	12
Camps, resort day and night with limited plumbing	per campsite	50	0.05	0.05	24
Luxury camps with flush toilets	per campsite	100	0.1	0.1	24
Dump station	per campsite	50	0.05	0.05	24
[1] For all dwelling units the design shall be based on two persons per bedroom.					

Statutory Authority

§§ 32.1-12 and 32.1-164 of the Code of Virginia.

Historical Notes

Derived from VR355-34-02 § 4.2, eff. February 5, 1986; amended, eff. May 11, 1988; Virginia Register Volume 16, Issue 16, eff. July 1, 2000.

EXHIBIT 4

15A NCAC 02T .0114 WASTEWATER DESIGN FLOW RATES

(a) This Rule shall be used to determine wastewater flow rates for all systems governed by this Subchapter unless alternate criteria are provided by a program-specific rule or for flow used for the purposes of 15A NCAC 02H .0105. Higher flow rates shall be required where usage and occupancy are atypical, including those in Paragraph (e) of this Rule. Wastewater flow calculations shall take hours of operation and anticipated maximum occupancies and usage into account when calculating peak flows for design.

(b) In determining the volume of sewage from dwelling units, the flow rate shall be 120 gallons per day per bedroom. The minimum volume of sewage from each dwelling unit shall be 240 gallons per day and each additional bedroom above two bedrooms shall increase the volume by 120 gallons per day. Each bedroom or any other room or addition that can function as a bedroom shall be considered a bedroom for design purposes. When the occupancy of a dwelling unit exceeds two persons per bedroom, the volume of sewage shall be determined by the maximum occupancy at a rate of 60 gallons per person per day.

(c) The following table shall be used to determine the minimum allowable design daily flow of wastewater facilities. Design flow rates for establishments not identified below shall be determined using available flow data, water-using fixtures, occupancy or operation patterns, and other measured data.

Type of Establishments	Daily Flow For Design
Barber and beauty shops	
Barber Shops	50 gal/chair
Beauty Shops	125 gal/booth or bowl
Businesses, offices and factories	
General business and office facilities	25 gal/employee/shift
Factories, excluding industrial waste	25 gal/employee/shift
Factories or businesses with showers or food preparation	35 gal/employee/shift
Warehouse	100 gal/loading bay
Warehouse – self storage (not including caretaker residence)	1 gal/unit
Churches	
Churches without kitchens, day care or camps	3 gal/seat
Churches with kitchen	5 gal/seat
Churches providing day care or camps	25 gal/person (child & employee)
Fire, rescue and emergency response facilities	
Fire or rescue stations without on site staff	25 gal/person
Fire or rescue stations with on-site staff	50 gal/person/shift
Food and drink facilities	
Banquet, dining hall	30 gal/seat
Bars, cocktail lounges	20 gal/seat
Caterers	50 gal/100 sq ft floor space
Restaurant, full Service	40 gal/seat
Restaurant, single service articles	20 gal/seat
Restaurant, drive-in	50 gal/car space
Restaurant, carry out only	50 gal/100 sq ft floor space
Institutions, dining halls	5 gal/meal
Deli	40 gal/100 sq ft floor space
Bakery	10 gal/100 sq ft floor space
Meat department, butcher shop or fish market	75 gal/100 sq ft floor space
Specialty food stand or kiosk	50 gal/100 sq ft floor space
Hotels and Motels	
Hotels, motels and bed & breakfast facilities, without in-room cooking facilities	120 gal/room
Hotels and motels, with in-room cooking facilities	175 gal/room
Resort hotels	200 gal/room
Cottages, cabins	200 gal/unit
Self service laundry facilities	500 gal/machine
Medical, dental, veterinary facilities	
Medical or dental offices	250 gal/practitioner/shift
Veterinary offices (not including boarding)	250 gal/practitioner/shift

Veterinary hospitals, kennels, animal boarding facilities	20 gal/pen, cage, kennel or stall
Hospitals, medical	300 gal/bed
Hospitals, mental	150 gal/bed
Convalescent, nursing, rest homes without laundry facilities	60 gal/bed
Convalescent, nursing, rest homes with laundry facilities	120 gal/bed
Residential care facilities	60 gal/person
Parks, recreation, camp grounds, R-V parks and other outdoor activity facilities	
Campgrounds with comfort station, without water or sewer hookups	75 gal/campsite
Campgrounds with water and sewer hookups	100 gal/campsite
Campground dump station facility	50 gal/space
Construction, hunting or work camps with flush toilets	60 gal/person
Construction, hunting or work camps with chemical or portable toilets	40 gal/person
Parks with restroom facilities	250 gal/plumbing fixture
Summer camps without food preparation or laundry facilities	30 gal/person
Summer camps with food preparation and laundry facilities	60 gal/person
Swimming pools, bathhouses and spas	10 gal/person
Public access restrooms	325 gal/plumbing fixture
Schools, preschools and day care	
Day care and preschool facilities	25 gal/person (child & employee)
Schools with cafeteria, gym and showers	15 gal/student
Schools with cafeteria	12 gal/student
Schools without cafeteria, gym or showers	10 gal/student
Boarding schools	60 gal/person (student & employee)
Service stations, car wash facilities	
Service stations, gas stations	250 gal/plumbing fixture
Car wash facilities	1200 gal/bay
Sports centers	
Bowling center	50 gal/lane
Fitness, exercise, karate or dance center	50 gal/100 sq ft
Tennis, racquet ball	50 gal/court
Gymnasium	50 gal/100 sq ft
Golf course with only minimal food service	250 gal/plumbing fixture
Country clubs	60 gal/member or patron
Mini golf, putt-putt	250 gal/plumbing fixture
Go-kart, motocross	250 gal/plumbing fixture
Batting cages, driving ranges	250 gal/plumbing fixture
Marinas without bathhouse	10 gal/slip
Marinas with bathhouse	30 gal/slip
Video game arcades, pool halls	250 gal/plumbing fixture
Stadiums, auditoriums, theaters, community centers	5 gal/seat
Stores, shopping centers, malls and flea markets	
Auto, boat, recreational vehicle dealerships/showrooms with restrooms	125 gal/plumbing fixture
Convenience stores, with food preparation	60 gal/100 sq ft
Convenience stores, without food preparation	250 gal/plumbing fixture
Flea markets	30 gal/stall
Shopping centers and malls with food service	130 gal/1000 sq ft
Stores and shopping centers without food service	100 gal/1000 sq ft
Transportation terminals – air, bus, train, ferry, port and dock	5 gal/passenger

(d) Design daily flow rates for proposed non-residential developments where the types of use and occupancy are not known shall be designed for a minimum of 880 gallons per acre, or the applicant shall specify an anticipated flow based upon anticipated or potential uses.

(e) Design daily flow rates for residential property on barrier islands and similar communities located south or east of the Atlantic Intracoastal Waterway and used as vacation rental as defined in G.S. 42A-4 shall be 120 gallons per day per habitable room. Habitable room shall mean a room or enclosed floor space used or intended to be used for living or sleeping, excluding kitchens and dining areas, bathrooms, shower rooms, water closet compartments, laundries, pantries, foyers, connecting corridors, closets, and storage spaces.

(f) An adjusted daily sewage flow design rate shall be granted for permitted but not yet tributary connections and future connections tributary to the system upon showing that the capacity of a sewage system is adequate to meet actual daily wastewater flows from a facility included in Paragraph (b) or (c) of this Rule without causing flow violations at the receiving wastewater treatment plant or capacity-related sanitary sewer overflows within the collection system as follows:

(1) Documented, representative data from that facility or a comparable facility shall be submitted by an authorized signing official in accordance with Rule .0106 of this Section to the Division for all flow reduction requests, as follows:

(A) dates of flow meter calibrations during the time frame evaluated and indication if any adjustments were necessary;

(B) a breakdown of the type of connections (e.g. two bedroom units, three bedroom units) and number of customers for each month of submitted data as applicable. Identification of any non-residential connections including subdivision clubhouses and pools, restaurants, schools, churches and businesses. For each non-residential connection, information identified in Paragraph (c) of this Rule (e.g. 200 seat church, 40 seat restaurant, 35 person pool bathhouse);

(C) a letter of agreement from the owner or an official, meeting the criteria of Rule .0106 of this Section, of the receiving collection system or treatment works accepting the wastewater and agreeing with the adjusted design rate;

(D) age of the collection system;

(E) analysis of inflow and infiltration within the collection system or receiving treatment plant, as applicable;

(F) if a dedicated wastewater treatment plant serves the specific area and is representative of the residential wastewater usage, at least the 12 most recent consecutive monthly average wastewater flow readings and the daily total wastewater flow readings for the highest average wastewater flow month per customers, as reported to the Division;

(G) if daily data from a wastewater treatment plant cannot be used or is not representative of the project area: 12 months worth of monthly average wastewater flows from the receiving treatment plant shall be evaluated to determine the peak sewage month. Daily wastewater flows shall then be taken from a flow meter installed at the most downstream point of the collection area for the peak month selected that is representative of the project area. Justification for the selected placement of the flow meter shall also be provided; and

(H) an estimated design daily sewage flow rate shall be determined by calculating the numerical average of the top three daily readings for the highest average flow month. The calculations shall also account for seasonal variations, excessive inflow and infiltration, age and suspected meter reading and recording errors.

(2) The Division shall evaluate all data submitted but shall also consider other factors in granting, with or without adjustment, or denying a flow reduction request including: applicable weather conditions during the data period (i.e. rainy or drought), other historical monitoring data for the particular facility or other similar facilities available to the Division, the general accuracy of monitoring reports and flow meter readings, and facility usage, such as whether the facility is in a resort area.

(3) Flow increases shall be required if the calculations required by Subparagraph (f)(1) of this Rule yield design flows higher than that specified in Paragraphs (b) or (c) of this Rule.

(4) The permittee shall retain the letter of any approved adjusted daily design flow rate for the life of the facility and shall transfer such letter to a future permittee.

History Note: *Authority G.S. 143-215.1; 143-215.3(a)(1);*
Eff. September 1, 2006;
Readopted Eff. September 1, 2018.

EXHIBIT 5

Ivy Proper
TMP58A-14 & 20
Tier 3 Groundwater Assessment
Groundwater Management Plan

Prepared for:

Building Management Company
400 Locust Avenue, suite 3
Charlottesville VA 22902

Draft submitted
September 3, 2020

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Key Findings

Hydrogeologic setting: Located in the valley of Little Ivy Creek just above the flood plain, the site is underlain by deep and well-drained soils that overlie fractured crystalline porphyroblastic biotite gneiss bedrock.

Groundwater availability: Soils and bedrock are favorable to water well construction. Recharge potential from onsite soils is excellent, and there is likely to be significant recharge from off site. Bedrock fracture potential is favorable.

Are Hydrogeologic conditions favorable to proposed use? Yes.

Contamination threats on record within 2000 feet of parcel? Yes. Due to the proximity of open LUST cases to the site, it is advisable to test any new well on the property for possible contaminants.

Additional contaminant threats observed in field reconnaissance? None.

Anticipated impacts of proposed use to existing users of groundwater? None

Anticipated impacts of proposed use to impact sustainability of groundwater resources? None

Groundwater management plan: Offset groundwater recharge lost due to impervious surface created during development by infiltrating runoff on site to the extent possible.

Project Overview

The proposal is to construct a 6500 square foot office building to include a veterinary clinic and general office space, on TMP58A-14 & 20, which comprise 0.87 acres on the north side of Ivy Road at Ivy (Figure 1). New impervious surface area created by the project will total 0.466 acres. A conceptual site plan showing the project layout and area of land disturbance is provided with this report.

Figure 1: Site location map

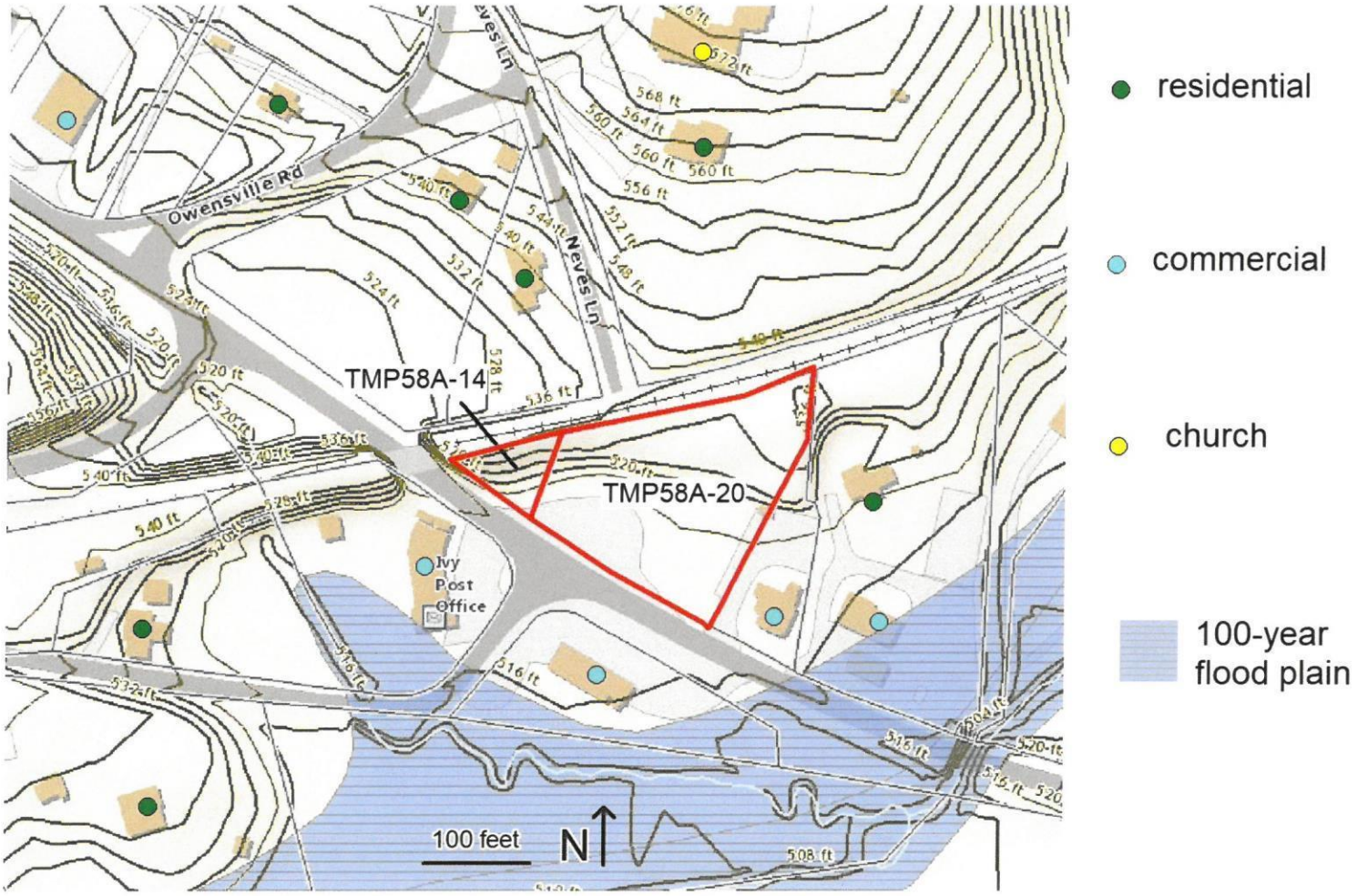


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Projected maximum water consumption for the facility is 875 gallons per day, based on usage by the veterinary clinic and office employees using restroom facilities. Water will be supplied by a well to be drilled on site. Waste water will be disposed of through an on-site drain field that has a permitted capacity of 875 gallons per day.

Adjoining parcels are in a mix of uses (Figure 2). While all adjoining parcels are within the Albemarle County Service Authority service area (water only), not all are connected to the system, and all use on-site drain fields for waste disposal.

Figure 2: location detail with nearby land usage



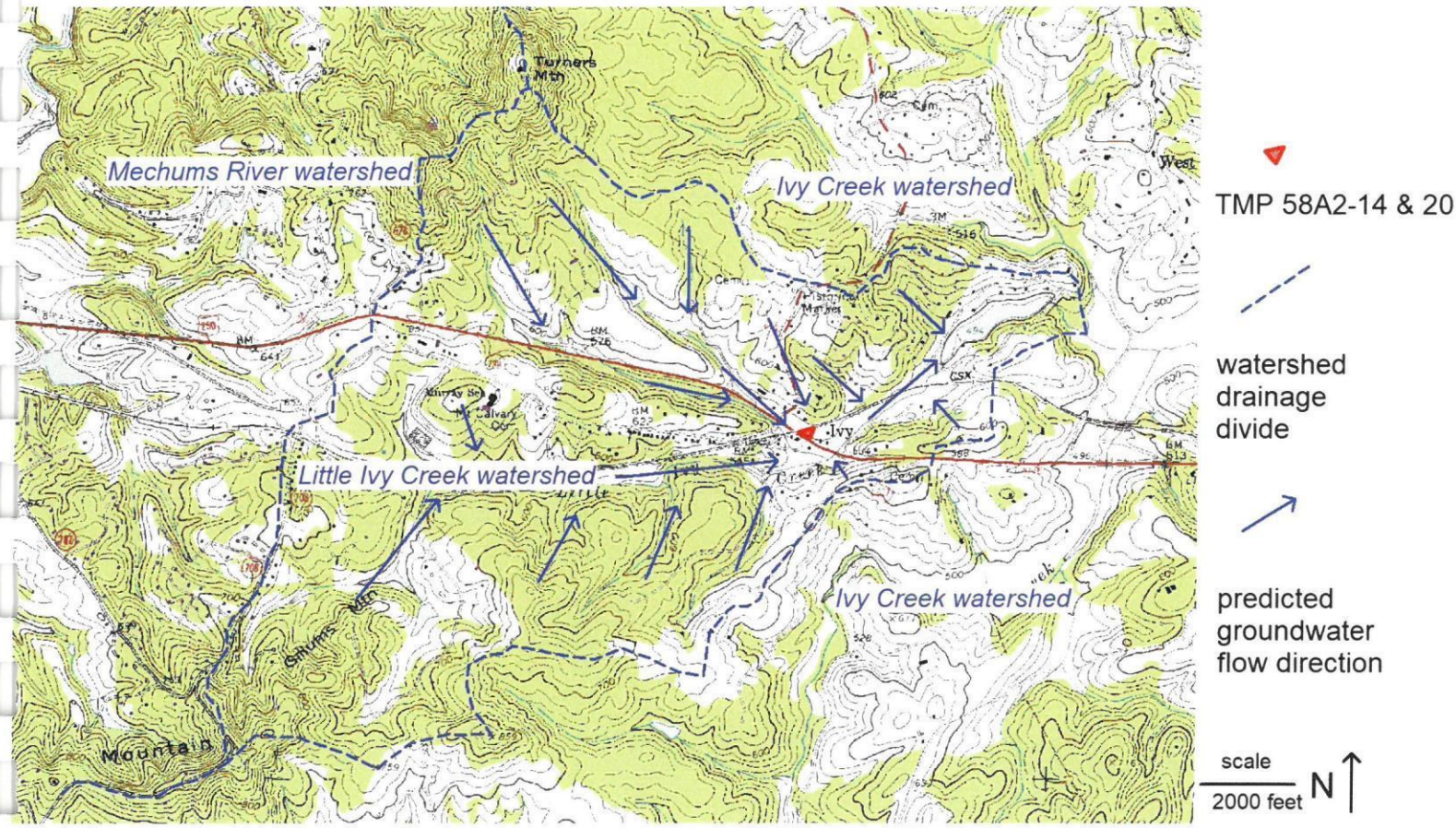
Hydrogeologic Assessment

Topography and hydrology

The parcels to be developed are located within the Little Ivy Creek watershed. Site elevations range between about 516 feet above sea level on the southeast edge along Ivy Road, to about 537 feet in the northeast corner at the rear of the property (Figures 2 and 3). The southern portion of the property slopes gently south toward the alluvial flood plain Little Ivy Creek. The western edge of the 100-year flood plain is about 100 feet south of the property. Slopes are steeper along the northern edge of the property. The landscape slopes upward to the north and west of the site, toward a drainage divide defined by Turners Mountain.

To a first approximation groundwater flow directions within a few hundred feet of the surface may be predicted to be down a hydraulic gradient that mimics surface topography. On this basis overall groundwater flow beneath the project site is predicted to be south to southeast, toward discharge in Little Ivy Creek.

Figure 3: Topography, watershed drainage divides, and predicted groundwater flow directions in the vicinity of TMP 58A2-14 & 20



Hydrogeology

In central Virginia, the physical characteristics of soils and the underlying bedrock are critical to the suitability of a given site to water well construction. Soils and weathered rock close to the surface serve as a "sponge" that captures rainwater, then feeds water downward to recharge fractures in the bedrock. Drinking water wells are normally constructed to tap water from deep bedrock fractures, while excluding potentially contaminated water that may exist in soils and weathered rock close to the surface. Groundwater becomes cleansed by passing downward through deeper soils and bedrock fissures. While the soils provide an excellent medium for recharge and groundwater storage, a successful well must intersect deeper water-bearing fracture networks in the bedrock that are interconnected with the soils as a source for recharge.

The soils on this site are classified as Yadkin clay loam, deeply eroded. These are described in the USDA Soil Survey as deep and well-drained, with moderate water storage capacity and moderate to high capacity to transmit water. These attributes are favorable for storage and transmission of groundwater. There is significant acreage up hydraulic gradient from the site to the north and west, which suggests potential for significant groundwater recharge from off site.

The crystalline bedrock beneath the project site is called porphyroblastic biotite gneiss. There is an exposure of this rock on the northern edge of the site in an erosion ditch on the slope leading up to the railroad bed (image left). This type of rock is very widespread in western Albemarle County.

The bedrock does not contain primary intergranular porosity through which groundwater might flow. Rather, groundwater flows in fractures and fissures, where such occur.

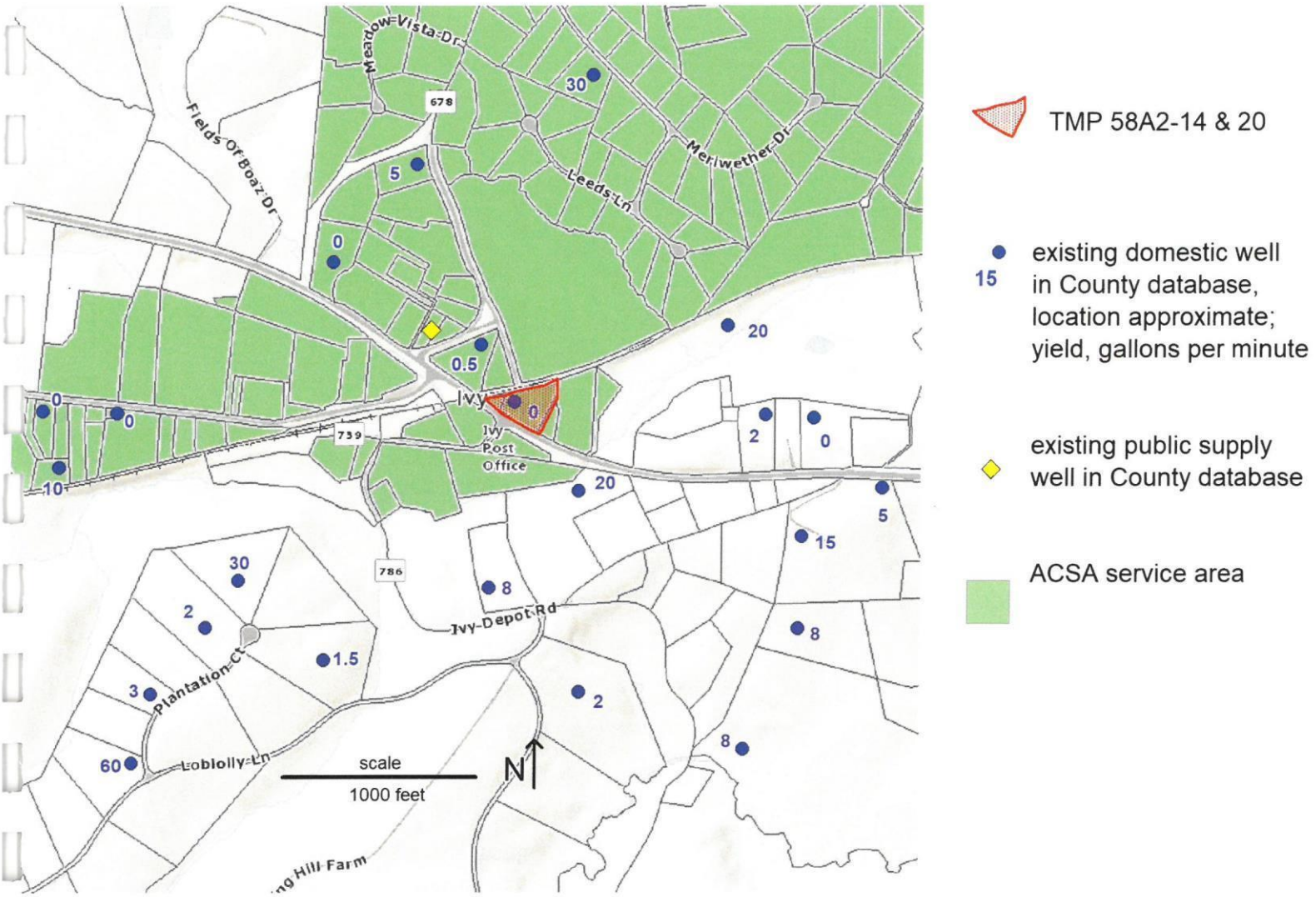


The reported yields from drilled wells are a good proxy for assessing the degree of bedrock fracture density, which has a direct correlation with the magnitude of yields of wells drilled into that rock.

Of 1536 database wells constructed in the porphyroblastic biotite gneiss bedrock present on this site, the average yield is 8.4 gallons per minute (GPM), and the average well depth is 218 feet. These numbers suggest that on average this type of rock is favorable in terms of fracture density.

Of 23 database wells in the vicinity of the site (Figure 4) in the County database, the average yield is 10 GPM, with a low of 0 GPM and a high of 60 GPM. Although 5 wells are reported as zero yield (dry holes), the numbers imply that overall bedrock fracture density is favorable to water well productivity in the vicinity of the project site. The existing well on the property is in the database as a zero yield well (drilled 1961, 122 feet deep). The applicant plans to abandon that well.

Figure 4: Existing wells in the County database in the vicinity of TMP 58A2-14 & 20, also showing ACSA service area extent



Water budget analysis of project impact

It is instructive to use quantitative water budget analysis to evaluate the proposed use of groundwater relative to natural groundwater recharge.

(data source: Sanford, W.E. and others, 2011, *Quantifying components of the hydrologic cycle in Virginia using chemical hydrograph separation and multiple regression analysis:* USGS Scientific Investigations Report 2011-5198)

Annual precipitation, Albemarle County: **46.8 inches--normal year**
25.7 inches--drought year (d)

Percentage of precipitation contributing to groundwater recharge, subtracting runoff and evapotranspiration: **32%**

Annual regional groundwater recharge: **14.98 inches**
8.39 inches (d)

Average regional daily groundwater recharge: .04104 inches = **.00342 feet**
.02299 inches = **.00192 feet (d)**

Daily recharge per acre: (.00342 feet) X (43560 square feet per acre)
= **149 cubic feet recharge per acre**
84 (d)

Gallons recharge per day per acre: 149 cubic feet X 7.48 gallons per cubic foot = **1115 gallons per day per acre**
682 (d)

Recharge area available on project site: (0.87 acres) – (0.466 acres new impervious surface) = **.404 acres**

Gallons per day natural recharge to site post development: (1115 gallons per acre) X (.404 acres) = **450 gallons per day**
275 gallons per day (d)

Predicted maximum daily groundwater withdrawal post development: **875 gallons per day**

Estimated proportion of daily withdrawal that is consumptive (water not returned to the ground on site through the drain field, for example water carried off-site in containers, or water lost to evaporation): **5%**, or **43.8 gallons per day.**

The proposed consumptive usage of groundwater amounts to about 10% of daily recharge to the site post development under normal precipitation, and about 16% during drought years.

Potential for proposed use to affect existing users of groundwater

While the County database contains records for many wells in the vicinity of the proposed project site (Figure 4), it is not clear which of these are still in service due to expansion of the ACSA service area. Regardless, TMP58A-14 & 20 is down hydraulic gradient from all existing wells on record. The water budget

analysis, above, suggests that a well drilled on this site and pumped to supply the modest demands of the proposed use would have no foreseeable impact on existing users of groundwater on nearby parcels.

Potential for proposed use to impact sustainability of groundwater resources

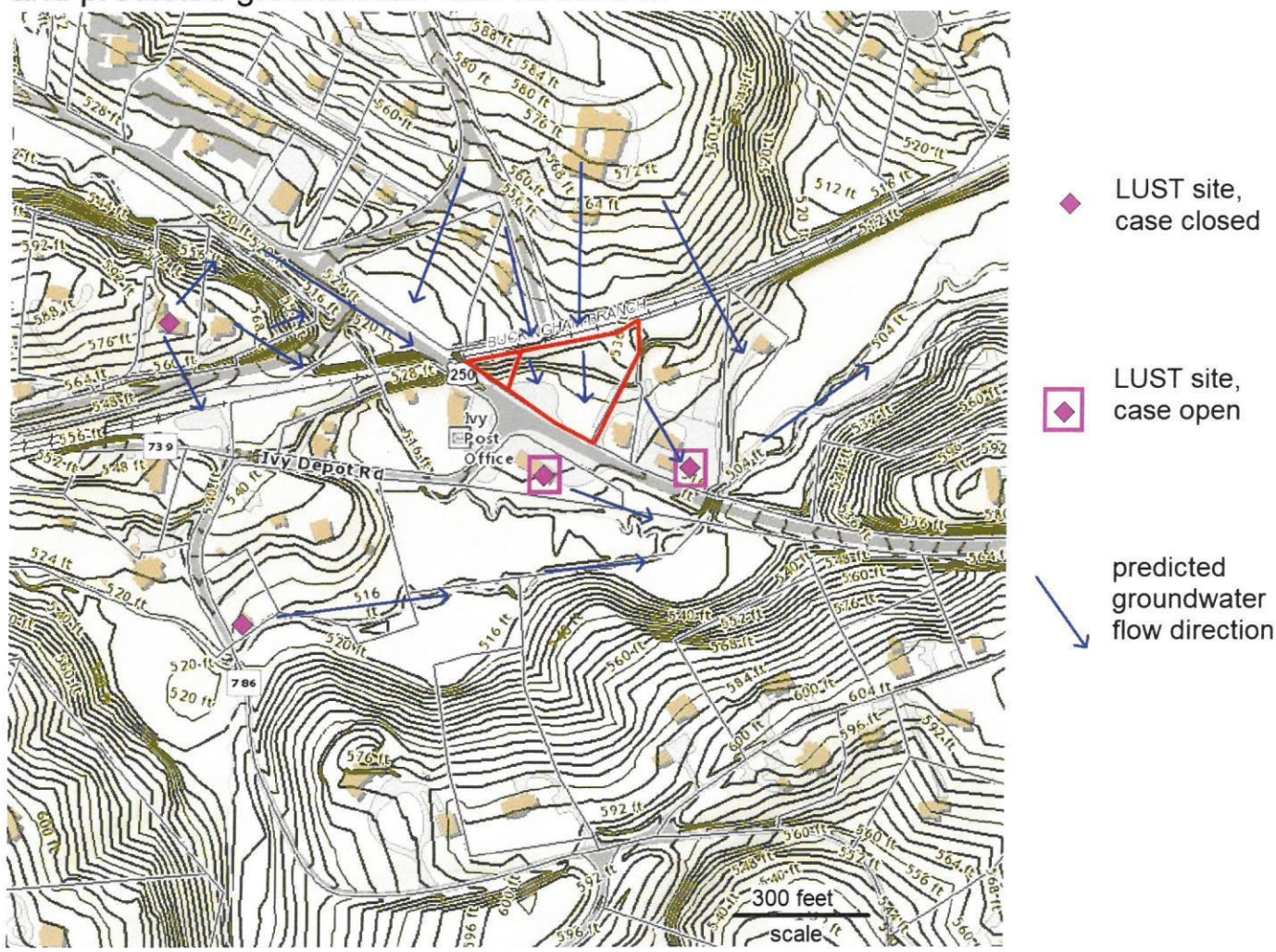
The proposed withdrawal of 875 GPD, of which roughly 844 GPD are returned to the ground as recharge through the drain field, would have no foreseeable impacts on regional groundwater resources in the long term.

Contaminant threats affecting the proposed site

A Phase 1 Environmental Assessment of the property was conducted in 2019 by ECS Mid-Atlantic LLC (attached to this report). This assessment found four documented LUST (leaking underground storage tank) cases within 1000 feet of the site. (Figure 5).

In reviewing these cases, none appear to pose potential impacts to the project

Figure 5: LUST sites on record within 1000 feet of TMP58A-14 & 20 and predicted groundwater flow directions



site. The two sites listed as "closed" are hydraulically up gradient from the property. Neither is considered a potential threat to groundwater quality on TMP58A-14 & 20 because of their "closed" status and relative distance from the site. The two "open" cases are closer to the site, but both are down gradient hydraulically from the site, and not likely to impact a well drilled on site.

A comprehensive study was conducted at the Scott's Exxon LUST site, located 300 feet southeast of the project site (Sullivan International Corporation, 2013, attached to this report). The data from this study confirm that groundwater flow in the area is toward the south-southeast, which would carry contaminants away from TMP58A-14 & 20. A domestic well on 58A2-20A, which is between the Scott's Exxon site and the proposed development site, was tested and found to be impacted by MBTE contamination from the spill. It is advisable that any well drilled on the proposed development site be tested for possible contaminants.

Threats of contamination by proposed project

There are no perceived threats to groundwater quality by the proposed use.

Reserve wellfield

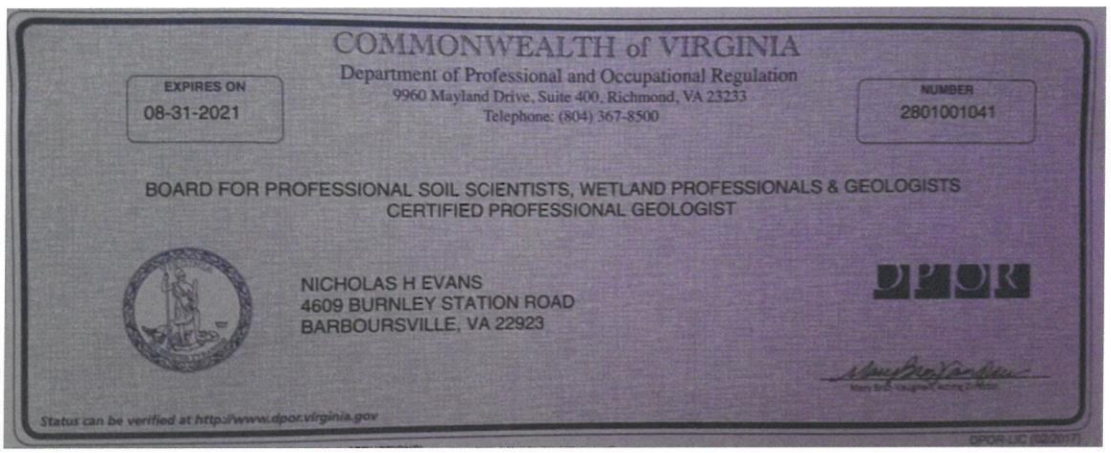
The limited size of the property poses potential challenges to siting a replacement well if the supply well for the project becomes compromised in some way.

Groundwater management plan

Offset groundwater recharge lost due to impervious surface created during development by infiltrating runoff on-site to the extent possible.

Submitted by Nicholas H. Evans, CPG # 2801 001041

September 3, 2020 _____


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S:\HDSA\932 Ivy_Project\CAD\Sheets\CLOSE4 SITE.dwg | Plotted on 3/24/2022 5:19 PM | by Clint Shiflett



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CLINT W. SHIFLETT — COMMONWEALTH OF VIRGINIA — LICENSED PROFESSIONAL ENGINEER — 3-24-2022

SHEET NO.	C4.0
PROJECT NO.	42932
SCALE	1" = 20'
DESIGNED BY	C. SHIFLETT
DRAWN BY	C. SHIFLETT
CHECKED BY	A. FONTAINE
DATE	12-10-2020

IVY PROPER - FINAL SITE PLAN

ALBEMARLE COUNTY, VIRGINIA

LAYOUT PLAN

DATE	REVISION DESCRIPTION
2021-06-24	COUNTY COMMENTS
2021-09-14	COUNTY COMMENTS
2021-11-29	COUNTY COMMENTS
2022-01-17	COUNTY COMMENTS: FOR APPROVAL
2022-03-24	COUNTY COMMENTS: FOR APPROVAL

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