PLANNING COMMISSION WORK SESSION
Wednesday, May 1, 2024 @ 6 PM
Town Hall – 2nd Floor, East Conference Room

AGENDA

CALL TO ORDER

ROLL CALL

WORK SESSION BUSINESS

- **2400019 – Abode of Liberation –** A request for a Special Use Permit for a lodging house located at 1324 Old Winchester Pike, identified by Tax Map 20A12-4-6. The property is zoned R-3, Residential District.

- **2400250 – Rappahannock HC, LLC** – A Rezoning Application requesting an amendment to the zoning map to reclassify 1321 Happy Creek Road, identified by Tax Map 20A21-2-4 from R-S, Suburban Residential District to R-1, Residential District.

OTHER

ADJOURNMENT

WORK SESSION

ITEM 1

SPECIAL USE PERMIT APPLICATOIN #2400019

ABODE OF LIBERATION

TOWN OF FRONT ROYAL

DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT
102 EAST MAIN STREET — **Main: 540.635.4236**
P.O. BOX 1560 — **Fax: 540.631.2727**
FRONT ROYAL, VA 2263 — **www.frontroyalva.com**

SPECIAL USE PERMIT REQUEST

FRSPU 2400019

APPLICANT:

NAME Abode of Liberation PHONE 540.454.2161

ADDRESS 1324 Old Winchester Pike, Front Royal, VA 22630

E-MAIL Jenelle@AbodeOfLiberation.com

PROPERTY OWNER:

NAME Jenelle Embrey PHONE 540.454.2161

ADDRESS 1324 Old Winchester Pike, Front Royal, VA 22630

E-MAIL Jenelle@AbodeOfLiberation.com

RECEIVED JAN - 5 2024 TOWN OF FRONT ROYAL PLANNING & ZONING DEPARTMENT

PROPERTY DESCRIPTION

PROPERTY ADDRESS 1324 Old Winchester Pike, Front Royal, VA 22630

TAX MAP ~~20A124~~ 20A12 SECTION ~~20A124~~ 4 BLOCK ~~20A124~~ LOT 6

SUBDIVISION NAME _____ ACREAGE .89

REQUEST

ZONING DISTRICT Residential District R-3 (permits a boarding house via SUP)

PROPOSED USE OF PROPERTY Nonprofit Boarding House for people of different abilities and their caregivers

SPECIFIC SPECIAL USE PERMIT REQUEST

Permission to bring my nonprofit boarding house into compliance via SUP

ATTACHMENTS --The following *must* be submitted with the application. Additional information may be required depending on the nature of the request.

1. Survey/Plat of property showing all **existing** improvements.
   (10 copies if larger than 11" X 17")
2. Site Plan Application — pd w/cc
3. Application Fee of $400.00 **Receipt #** 1072 **Date Paid** 1-5-2024
4. Additional information as required by the Dept. of Planning & Community Development.

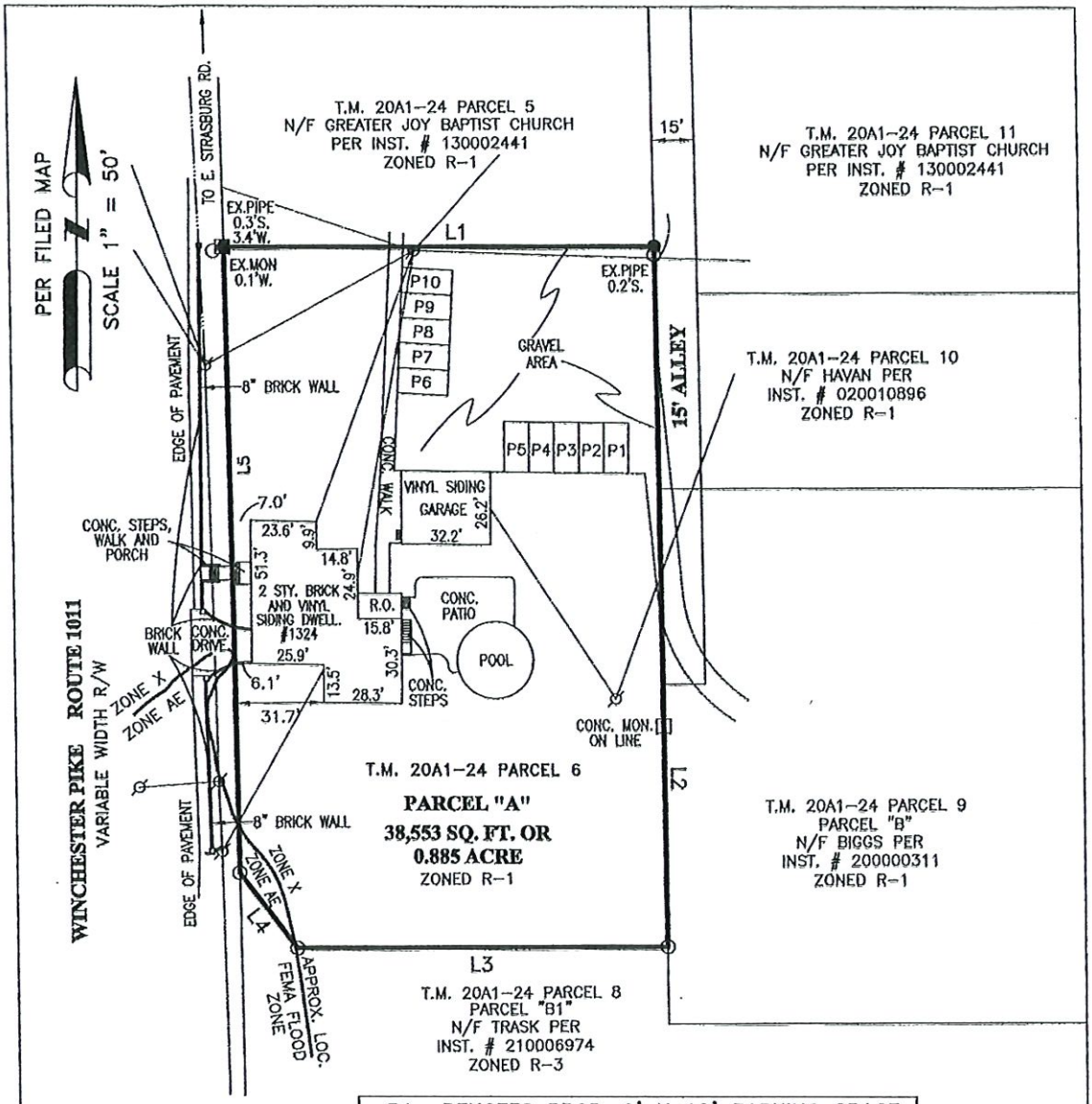
CERTIFICATION

I certify that the information provided with this application is correct to the best of my knowledge and should the special use permit be granted, the project will comply with the conditions imposed upon it and will be implemented only as approved by Town Council.

Signature Jenelle Embrey Date 3/19/2024

By submitting this application, the applicant grants permission to Town officials and employees to enter upon the property, which is the subject of this application, during reasonable hours and for purposes related to the application process.

Revised 4-21-2021



LINE	BEARING	DISTANCE
L1	N 89°04'00" E	155.40'
L2	S 01°05'00" E	251.00'
L3	S 89°04'00" W	134.00'
L4	N 37°45'50" W	33.64'
L5	N 01°25'00" W	224.08'

P1	DENOTES PROP. 9' X 18' PARKING SPACE.
ø	DENOTES UTILITY POLE.
●	DENOTES PIN SET.
□	DENOTES EXISTING CONC. MON.
○	DENOTES EXISTING PIN OR PIPE.
——	DENOTES OVERHEAD WIRES.

NO TITLE REPORT FURNISHED TO THIS OFFICE.
SUBJECT TO ANY AND ALL EASEMENT OF RECORD.

DERIVATION OF TITLE TO: JE NELLE EMBREY
PER INSTRUMENT # 200008957.

SUBJECT PARCEL SITUATED IN FLOOD ZONES X AND AE
PER FIRM MAP NO. 51187C0104C EFFECTIVE DATE
JUNE 3, 2008.

PROPERTY ZONED R-1.

SURVEY OF PARCEL "A" PER PLAT OF RE-SUBDIVISION OF
LOTS 1, 3 AND THE J.E. LENT LOTS AT RIVERTON
RECORDED IN DEED BOOK 273 PAGE 137

NORTH RIVER MAGISTERIAL DISTRICT

TOWN OF FRONT ROYAL

WARREN COUNTY, VA.

COMMONWEALTH OF VIRGINIA
Joseph G. Brogan Jr.
JOSEPH G. BROGAN, JR.
Lic No. 3209
12/26/2023
LAND SURVEYOR

PREPARED BY:
BROGAN LAND SURVEYING, PLC
P.O. BOX 1578
FRONT ROYAL, VA. 22630-0034
TEL. & FAX (540) 635-5657
AUGUST 13, 2020
DECEMBER 26, 2023 ADD PROP. PARKING

WORK SESSION

ITEM 2

REZONING APPLICATION #2400250

RAPPAHANNOCK HC, LLC

TOWN OF FRONT ROYAL ~102 East Main Street, Front Royal, Va. 22630 ~ 540-635-4236
Department of Planning & Zoning

~~FRREZON~~ 2400250

REZONING APPLICATION

APPLICANT

Name Rappahannock HC, LLC Phone 5402737498

Address 1016 Charles St. Fredericksburg, VA 22401

E-mail chornung@teamrdg.com

PROPERTY OWNER OF RECORD

Name Rappahannock HC, LLC Phone 5402737498

Address 1016 Charles St. Fredericksburg, VA 22401

PROPERTY DESCRIPTION

Location/Street Address 1321 Happy Creek Road

Number of lots: 104 Total Acreage 42.99

Tax Map Identification for each parcel (Map, Section, Block, & Lot):
20-A-212-4

Subdivision Name (if applicable) Ashton Green

RECEIVED
APR 04 2024
TOWN OF FRONT ROYAL
PLANNING & ZONING DEPARTMENT

REQUEST

Existing Zoning R-S Proposed Zoning R-1

Existing Use Vacant Proposed Use Single-Family Subdivision

ATTACHMENTS

The following should be submitted with a completed copy of this application. Additional information may be determined necessary depending on the nature of the request.

1. Application Fee *(Checks should be made out to the Town of Front Royal. Fees are as follows: 1 acre or less = $500, over 1 acre = $500 + $100 per acre after 1st acre, Downzoning = $400)*
2. Survey/Plat of the property with metes and bounds descriptions for all existing and proposed property lines and zoning district boundaries *(8 copies and a digital copy)*.
3. Environmental Site Assessment Phase I and Phase II *(unless waived by Director)*.
4. Traffic Impact Analysis *(if required)*
5. Written proffers. Proffers are voluntary but should be submitted in a written format approved by the Director.
6. Statement of Justification. As a separate document, provide a statement or statements that explain why you believe the property should be rezoned.

CERTIFICATION

I certify that the information provided with this application is correct to the best of my knowledge. The proffering system has been explained to me and I have read Sections 175-149 and 175-150 of the Town of Front Royal Zoning Ordinance pertaining to conditional zoning and proffering.

Signature of Property Owner

Signature of Applicant (if different)

City/County of Fredericksburg, Commonwealth of Virginia
The foregoing instrument was acknowledged before me this 3rd day of April, 2024 by Chris Hornung.
(Name of person seeking acknowledgement)

Notary Public
Notary registration number: 329916 My commission expires: 07.31.25

ARICA R. CONYERS NOTARY PUBLIC MY COMMISSION NUMBER 329916 COMMONWEALTH OF VIRGINIA

NOTICES

→ Staff will notify adjacent property owners of the rezoning request and the scheduled public hearing dates with the Planning Commission and Town Council.
→ Town Staff will place an advertisement in the local newspaper as required under Virginia Code §15.2-2204.
→ Town Staff will place a public hearing sign(s) at the location of the proposed rezoning.
→ Submission of this application does not establish a vested right as outlined under Virginia Code §15.2-2307.
→ By submitting this application, the applicant grants permission to the Town officials and employees to enter upon the property, which is the subject of this application, during reasonable hours and for purposes related to the application process.
→ When the applicant is different than the fee simple property owner, the signature by the fee simple property owner on this application shall be considered as authorization for the applicant to act as an agent for matters concerning this application.

OFFICE USE ONLY

Receipt # 1261 Date Paid 4-4-24 pd 4700.00 Check #1671
Planning Commission Hearing Date: _____ Recommendation: _____
Town Council Hearing Date: _____ Date Sent to Clerk: _____

Rezoning Justification for

Ashton Green

Town of Front Royal, Virginia

RAPPAHANNOCK
DEVELOPMENT GROUP

Rezoning Justification

Owner:	Rappahannock HC, LLC 1016 Charles Street, Fredericksburg, VA 22401
Owner:	Rappahannock HC, LLC
Representative:	Thomas Moore Lawson, Esquire Thomas Moore Lawson, P.C. Of Counsel-Williams Mullen P.O. Box 2740 Winchester, VA 22604 Ph: 540-665-0050 Fax: 540-722-4051 Email: tlawson@lsplc.com
Project Name:	"Ashton Green"
Property:	Tax Map Parcel 20-A-212-4 in the Town of Front Royal (the "Town"), Warren County, Virginia, consisting of 42.99 acres +/-, known as 1321 Happy Creek Road (the "Property")
Date:	April 3, 2024
RCP:	"Rezoning Concept Plan for Ashton Green," prepared by Greenway Engineering, dated March 8, 2024, last revised March 27, 2024, attached hereto as Exhibit A ("RCP")
Rezoning Request:	From R-S to R-1
Rezoning File No.:	R24-00____

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1. Project Overview

The Owner proposes rezoning the 43.0-acre Property from the Suburban Residential District ("R-S") to the Residential District ("R-1"). The Property's current Suburban Residential zoning permits the Owner to construct up to eighty-two (82) single-family detached residential units by-right. The proposed rezoning would permit narrower residential lots, allowing the Owner to construct an additional 22 residential lots for a total of one-hundred four (104) single-family residential units. The proposed density of 2.42 units per acre is more consistent with the surrounding development pattern of R-1 subdivisions and the Town's Comprehensive Plan. The rezoning would also allow the Owner to reserve additional preserved and recreational open space for the Property. The Owner is proposing to mitigate the impact of the additional residential units on Town and County capital improvements with cash proffers.

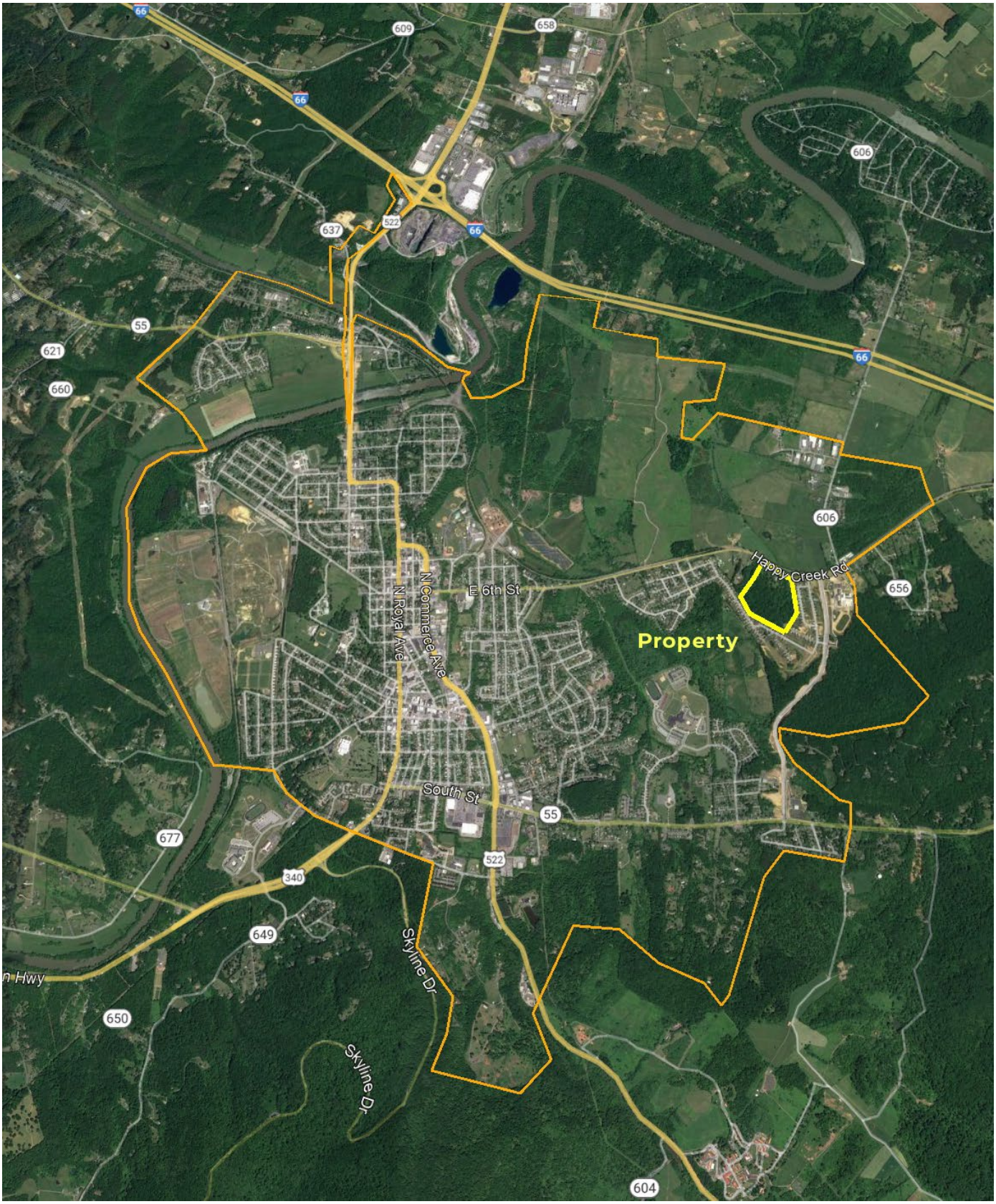


Figure 1. Property Location Map

2. Project Location

The Project is located on Town Tax Map Parcel 20-A2-12-4, totaling approximately 43.0 acres (see Figure 1). The Project was originally envisioned as a future phase of the Oden Ridge single-family residential subdivision. Oden Street, a public road, currently terminates at the Property with a temporary cul-de-sac which will be removed with the extension of Oden Street with the development of the Property. The Property is surrounded by single-family detached residential subdivisions. Oden Ridge subdivision abuts the Property to the east and Happy Creek Knolls lies to the south. The Property abuts Happy Creek Road to the north and a 4-acre Suburban Residential (R-S) zoned parcel to the west. To the east of the Happy Creek site, on the east side of Leach Run Parkway, is Warren County Middle School, which will serve future school-aged children residing on the Property. The expansive Warren Memorial Hospital is further south along Leach Run Parkway The 17,000-square-foot, three-story acute-care hospital includes 36 private patient rooms, 18 emergency beds, six observation beds, three operating rooms, and one cardiac catheterization lab. The 150-acre campus provides space for future expansion phases.

3. Project Description

The purpose of the proposed rezoning is to allow an increase in permitted single-family detached units on the Property from eighty-two 82 by-right units to one-hundred four (104) units, all as generally shown on the RCP and the Project Rendering provided as Exhibit B. The proposed development has a density of 2.42 dwelling units per acre and approximately 7.57 acres of open space, which accounts for 17.6% of the Property. The open space will be used for active and passive recreation, buffering, stormwater facilities and preservation of natural areas.

The Owner is proposing to rezone the Property from Suburban Residential District (R-S) to Residential District (R-1). Section 175-11 of the Town of Front Royal Municipal Code ("County") Zoning Ordinance states that the R-1 District standards "are designed to stabilize and protect the essential character of the areas so delineated, to promote and encourage a suitable environment for family life where there are children, to provide areas for suitable expansion of the Town as facilities are provided and to prohibit all commercial activities. Development is, therefore, limited to relatively low concentration, and permitted uses are limited to single-unit dwellings, plus selected additional uses, such as schools, parks, churches and certain public facilities that serve the residents of the district."

The R-1 District permits single-family detached dwellings by-right, with a minimum lot area of 10,000 s.f. (approximately ¼ acre) with public water and sewer. The average proposed lot size for the Project is 11,326 s.f. (0.26 acres). The minimum lot width in the R-1 District is 75' at the front setback which would permit a 50' wide single-family home. The Owner anticipates the homes within the Property to average 3,000 s.f. Examples of the types of homes proposed for the Project are provided in Exhibit C.

Primary access to the Project site will be provided via Oden Drive, with secondary access provided on Happy Creek Road. The Project also accommodates a future interparcel access stub to Tax Parcel # 20-A-212-14 should a road extension to the east be desired in the future. This connection is consistent with the Town's "Local Road Improvements Map" within the Comprehensive Plan (See Figure 2), which shows a future extension of Stuart Drive parallel to Happy Creek Road. The Owner is

not advocating that this connection be made but has designed the Project to allow for the extension if needed.

Figure 2. Local Roads Improvements Map

Prior to preparation of the RCP, Greenway Engineering performed a wetland delineation for the Property, which will be submitted to the U.S. Army Corps of Engineers for confirmation (See Exhibit D "Wetland Delineation Report"). There were no potential regulated waters, including wetlands, identified on the Property.

A Phase 1 Environmental Site Assessment Report (See Exhibit E "Phase 1 ESA") was conducted by ECS during the Owner's evaluation of the Property. In the Phase 1 ESA, ECS concluded that additional environmental assessment of the Property is not warranted at this time and cited the following:

> *"This assessment has revealed no evidence of recognized environmental conditions, controlled recognized environmental conditions, or significant data gaps in connection with the property."*

4. Planning and Zoning

The Project Property is currently zoned Suburban Residential (R-S) and has access to both public water and sewer. Based on the minimum lot size requirements for the R-S District, the Property could yield up to eighty-two (82) single-family detached dwelling units by-right. The proposed rezoning would permit narrower residential lots, allowing the Owner to construct an additional 22 residential lots for a total of one-hundred four (104) single-family residential units. The rezoning would also allow the Owner to reserve additional preserved and recreational open space for the Property.

The Property is identified as "Single-Family Residential (Medium Density)" in the Comprehensive Plan (see Figure 3). This land use is defined as follows:

> *One or more single-family dwellings with an overall density more than three (3) dwelling units per acre, and a maximum of six (6) dwelling units per acre. Includes single-family attached and single-family detached.*

The Project density of 2.42 units per acre is well below the maximum density of six units per acre recommended in the Comprehensive Plan and is more consistent with surrounding development patterns than the existing zoning designation allows. As shown in Table 1, the Project's proposed density is lower than the existing density of the Oden Ridge and Happy Creek Knolls single-family residential subdivisions, which average approximately 2.77 units per acre. These existing subdivisions are zoned R-1, the same zoning designation sought by the Owner. They feature recent home sales prices ranging from the mid-$300,000's to $500,000's. The Owner is requesting a rezoning of the Property to R-1 to allow it to be developed consistent with the Comprehensive Plan and these surrounding land uses.

The Owner believes that single-family detached dwellings are the most appropriate land use for the Property and is not pursuing zoning approval for single-family attached dwellings as envisioned as a permissible use by the Comprehensive Plan. In addition, the Owner is proffering to exclude other permitted uses with the R-1 District other than home occupations and accessory uses authorized under the district.

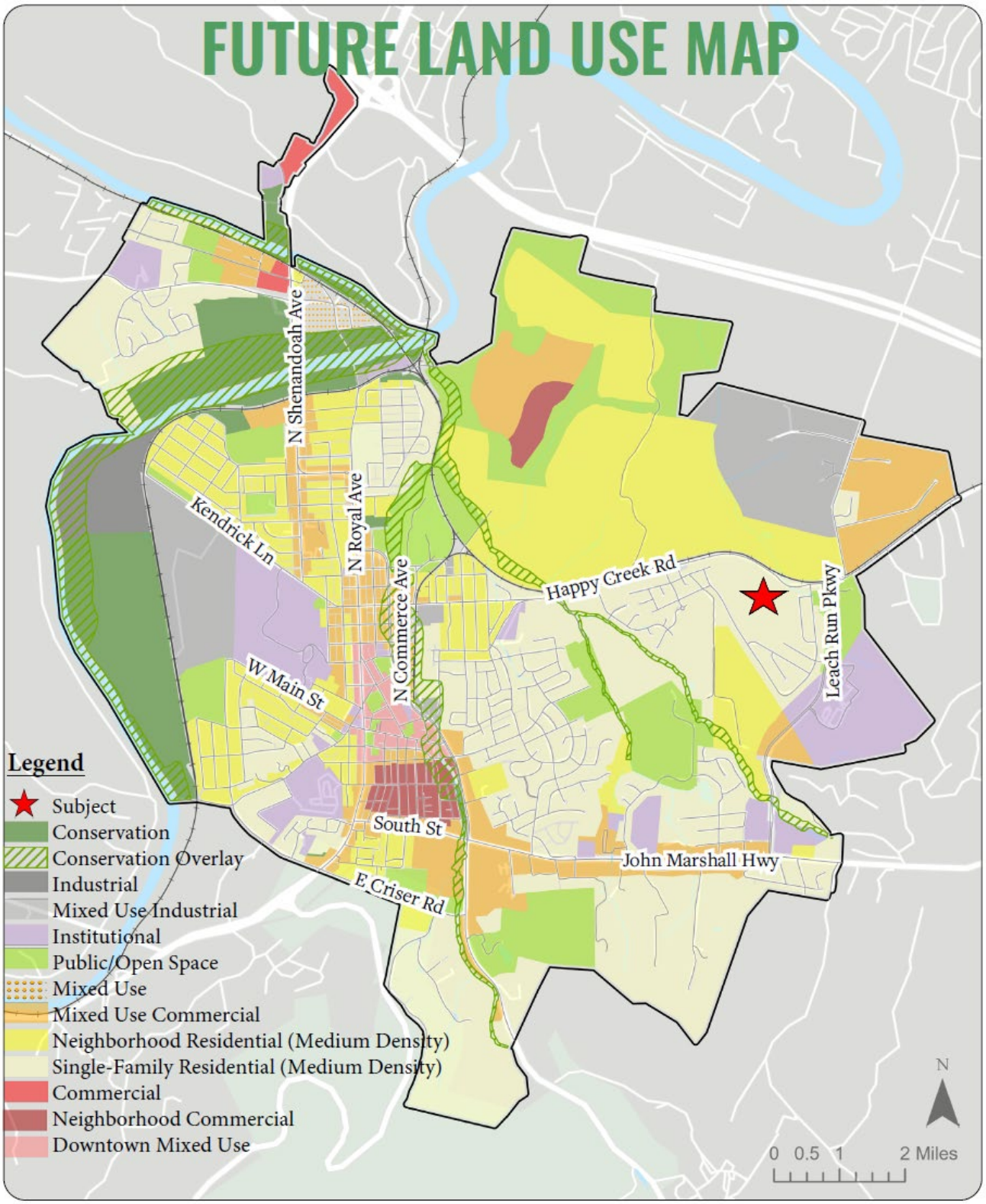


Figure 3. Future Land Use Map

Table 1. Density Comparison with Surrounding Subdivisions

Subdivision Name	Approx. Units/Ac.
Oden Ridge	2.68
Happy Creek Knolls	2.82
Average	**2.77**
Property	**2.42**

The Town's Action Strategies for the Leach Run Planning Area provides several Residential Land Use Policies that are met by the Project. These include:

1. Require future subdivision design that connects local streets with existing subdivision streets to create a more cohesive road network.
2. Ensure that future development is inclusive of pedestrian and recreational facilities, such as play areas or other amenities.

In summary, the Project: (i) is consistent with the land uses recommended in the Comprehensive Plan, (ii) is compatible with the existing uses in the area, specifically, the layout and density of the nearby subdivisions; (iii) will enhance the area's housing stock while maintaining the area's character; (iv) will provide onsite pedestrian and recreational facilities; and (v) is fiscally positive.

5. Public Facilities Impact

5.1 Fire and Rescue

The increased number of residential dwellings and citizens proposed by the Project will have minimal impact on the Town's fire and rescue facilities. The Property served by the Front Royal Volunteer Fire & Rescue Company 1, located approximately 3 miles from the Property on Commerce Avenue. Surplus annual tax revenues generated by the Project will offset any additional annual operating cost resulting from the approval of the proposed rezoning.

5.2 Schools

The Property is located within the Leslie Fox Keyser Elementary, Warren County Middle, and Warren County High school districts. All three schools are within 2 miles from the Property, including Warren County Middle, which was recently completed in 2017 and is less than a mile from the Property. Based on data from the Virginia Department of Education (VDOE), enrollment at each school has declined over the past five years and according to Warren County Public Schools (WCPS), all three schools are under their physical capacity limits.

Based on Warren County's Student Generation Rate of 0.364 (combined elementary, middle, and high school) students per dwelling unit (for single-family detached), the Project's 104 dwelling units will generate a net of 9 school-age children above the by-right (i.e., 104 units less 82 by-right units = 22

units evaluated) units at full build out. The 9 school-age children are anticipated to be distributed as follows: 4 elementary students, 2 middle school students, and 3 high school students.

Table 2 compares the projected number of future school-age children at the three zoned public schools with the current educational capacity. The projected addition of students at Leslie Fox Keyser Elementary will exceed its existing educational capacity. However, given the residual education capacity at Warren County Middle and Warren County High, the anticipated 5 new students for these schools will not surpass the educational capacities set by WCPS. These findings indicate that the Project will need to allocate funds to expand the educational capacity of the elementary school by an additional 4 students.

Table 2. Comparison of Current and Projected Educational Capacity

	Educational Capacity	Current Enrollment	Additional Students from Project	Enrollment w/ Project	Excess Educational Capacity	Direct Educational Capacity over Enrollment
LFKE	494	510	4	514	-20	-4
WCMS	800	530	2	533	267	0
WCHS	1,100	818	3	821	279	0

Warren County has long-term plans for a new elementary school to manage expected future enrollment growth. WCPS estimates that a new elementary school facility that can accommodate up to 600 students will cost approximately 29.9M, which amounts to $49,790 per student. Although there is no definitive timeline for a new elementary school at this time, the owner has included proffer considerations to address needed expansions to the elementary school system.

5.3 Parks, Buffers and Open Space

The Property will be served by existing Parks and Recreational Facilities within the Town, including Burrell Brooks Jr. Community Park, Skyline Soccerplex, Gertrude Miller Community Park, Chimney Field Park, and Lion's Park.

Approximately 17.6% of the Property will be maintained as permanent open space. The open space will include a tot lot, transitional buffers, stormwater facilities and preservation of natural areas. The tot lot will be constructed by the Owner prior to the issuance of an occupancy permit for the 75th unit within the Project and will be dedicated to the homeowner's association for future upkeep and maintenance. All buffers, landscaping, and setbacks will be as generally provided on the RCP and will conform to the applicable Zoning Ordinance requirements.

5.4 Water & Sewer

The Property will be served by public water and sewer already available to the Property. Based on preliminary conversations with Town staff, no offsite water or sewer improvements will be required to provide public utilities of sufficient capacity to the Property.

5.5 Transportation

A Traffic Impact Analysis (TIA) entitled "Traffic Impact Analysis Ashton Green Rezoning," prepared by Gorove Slade, dated March 29, 2024, has been submitted with this rezoning package and is attached as Exhibit I. The TIA provides the following conclusions:

> *"Based on the capacity and queueing analysis results, the proposed development will not have a substantial impact on the surrounding transportation and roadway network. Therefore, no improvements are recommended to mitigate the traffic generated by the proposed development."*

5.6 Stormwater Management

Stormwater management will be achieved through best management practices located regionally at drainage outfalls. All outfall locations will be analyzed to ensure the receiving channels are adequate and that the upstream stormwater management facilities detain the peak post development runoff in accordance with applicable state and Town requirements.

6. Fiscal Impacts

In general, new homes and residents generate new real estate, personal property, sales and use tax revenues, while also increasing the annual cost of governmental services, such as schools, law enforcement, and emergency services. In order to assess the anticipated annual fiscal impact of the Project, the Owner commissioned a fiscal impact analysis by S. Patz & Associates, Inc., which is titled "Fiscal Impact Analysis – Ashton Green," dated April 2024, attached hereto as Exhibit F ("Fiscal Impact Analysis"). The Fiscal Impact Analysis provides that the Project will generate (onsite and offsite) positive net tax benefits of **$407,620** annually at full buildout as summarized in Table 3.

Table 3. Happy Creek at Build-Out, Town of Front Royal, VA

	Onsite*	Offsite**	Total
Annual Town Revenues	$345,380	$255,770	$601,150
Annual Town Expenses	($105,600)	($87,930)	($193,530)
Net Fiscal Benefit	**$239,780**	**$167,840**	**$407,620**

* revenues/expenses generated or expended within the Property

** revenues/expenses generated or expended elsewhere within the Town

7. Capital Improvements Impact and Proffers

The Owner commissioned S. Patz & Associates to prepare a "School Proffer Analysis – Ashton Green," dated April 2024, attached hereto as Exhibit G. The additional 22 units created by the proposed rezoning are projected to generate a net increase in nine school-age children at build-out (4-elementary, 2-middle, 3-high) above the current by-right zoning. The County currently has excess capacity at the middle and high school level. Cash proffers to offset capital improvements to accommodate the 4 additional elementary students have been computed in the Proffer Analysis.

Exhibit H contains a draft proffer statement for the Project based on the Proffer Analysis. In addition to the school impact proffer, the Owner is voluntarily proffering an additional $320,840 in cash proffers ($3,085 per unit) to be used at the Town's discretion for transportation, parks, or other improvements within the Town. Proffers will be paid to the Town at the time of the issuance of Certificate of Occupancy for each of the 104 units.

EXHIBIT A

Rezoning Concept Plan

ASHTON GREEN

REZONING CONCEPT PLAN

HAPPY CREEK MAGISTERIAL DISTRICT
TOWN OF FRONT ROYAL, VIRGINIA

Sheet List Table

Sheet Number	Sheet Title
1	Cover Sheet
2	General Notes and Legend
3	Existing Conditions
4	Concept Layout Plan
5	Concept Illustrative Plan

VICINITY MAP

SCALE: 1" = 1000'

OWNER/APPLICANT
RAPPAHANNOCK HC,LLC
1016 CHARLES STREET
FREDERICKSBURG, VA 22401
(540) 656-2415

151 Windy Hill Lane
Winchester, Virginia 22602
Telephone: (540) 722-9455
Fax: (540) 722-9528
www.greenwayeng.com

GREENWAY ENGINEERING
FND 1971

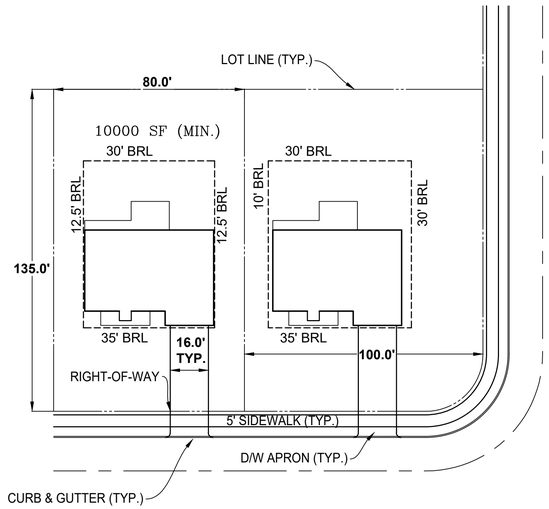
PROUDLY SERVING VIRGINIA & WEST VIRGINIA.
OFFICES IN: WINCHESTER, VA & MARTINSBURG, WV

COVER SHEET
ASHTON GREEN
REZONING CONCEPT PLAN
HAPPY CREEK MAGISTERIAL DISTRICT
TOWN OF FRONT ROYAL, VIRGINIA

COMMONWEALTH OF VIRGINIA
KEVIN A. SEWARD
Lic. No. 38586
04-05-2024
PROFESSIONAL ENGINEER

DATE:	04-05-2024
SCALE:	N/A
DESIGNED BY:	RAH/KAS
FILE NO.	6533R
SHEET 1 OF	5

PROJECT NOTES



TYPICAL LOT DETAIL
NTS

175-13 AREA AND FRONTAGE (R-1)

Area and frontage regulations shall be as follows:

175-48

Chapter 175 TOWN OF FRONT ROYAL MUNICIPAL CODE Chapter 175

A. On-lot water and sewer:
1. Minimum area per lot: forty thousand (40,000) square feet.
2. Minimum width at setback line: one hundred (100) feet.

B. Public water or public sewer:
1. Minimum area per lot: thirty thousand (30,000) square feet.
2. Minimum width at setback line: eighty (80) feet.

C. Public water and public sewer:
1. Minimum area per lot: ten thousand (10,000) square feet.
2. Minimum width at setback line: seventy-five (75) feet.

175-14 SETBACK (R-1)

Structures shall be located thirty-five (35) feet or more from any street right-of-way which is fifty (50) feet or greater in width or fifty-five (55) feet or more from the center of any street right-of-way less than fifty (50) feet in width; however, no building need be set back more than the average of the setback of the immediately adjoining structures on either side. A vacant lot fifty (50) feet or more in width may be assumed to be occupied by a building having a minimum setback.

175-15 YARDS (R-1)

A. Side: The minimum total width of the side yards shall be twenty-five (25) feet, with no one (1) side yard being less than ten (10) feet.

B. Rear: Each rear yard shall be a minimum of thirty (30) feet.

C. Front: The required depth of the front yard shall be as provided in Section 175-14. On lots of less than two (2) acres in size or where the front yard provided for any single-family dwelling is less than 150 feet, the main or front building facade and entrance shall be oriented toward the front yard of the property, unless an administrative variance is granted pursuant to Section 175-147.1.

(Added "C" 2-2-6-01-Effective Upon Passage)

D. Accessory buildings shall be setback from side and rear property lines by no less than five (5) feet.

(Added "D" 6-22-15-Effective Upon Passage)

175-16 LOT COVERAGE (R-1)

The maximum building coverage shall be thirty percent (30%).

175-49

Chapter 175 TOWN OF FRONT ROYAL MUNICIPAL CODE Chapter 175

175-17 HEIGHT (R-1)

A. Buildings may be erected up to two and one-half (2 1/2) stories, but not to exceed thirty-five (35) feet in height.

B. A public or semipublic building, such as a school, church or library, may be erected to a height of sixty (60) feet from grade, provided that required front, side and rear yards shall be increased one (1) foot for each foot in height over thirty-five (35) feet.

C. Church spires, belfries, cupolas, municipal water towers, chimneys, flues, flagpoles, television antennas and radio aerials are exempt. Parapet walls may be up to four (4) feet above the height of the building on which the walls rest.

D. No accessory building which is within twenty (20) feet of any party lot line shall be more than one (1) story high. All accessory buildings shall be less than the main building in height.

175-18 CORNER LOTS (R-1)

A. Of the two (2) or more yards of a corner lot with frontage along multiple streets, the front yard shall be established by the following criteria:

1. For new subdivision applications, the front yard shall be identified by the applicant on the subdivision site plan and approved by the Town on the approved final plat.

2. For new construction on existing corner lots where no front yard is designated on the approved final plat, the property owner shall determine the front yard on the Zoning Permit application and shall be approved by the Town on the approved Zoning Permit.

3. For existing structures, the front yard shall be the yard with frontage that the front façade of the primary building faces.

4. The approved front yard established by this Code Section shall only be changed by review and approval of a revised final plat approved by the Planning Commission. Such future requests shall be approved if the Planning Commission determines that the proposed front yard is consistent with other properties along the same street frontages.

(Amended "A" 6-22-15-Effective Upon Passage)

B. The side yard setback on the side facing the side street shall be thirty (30) feet or more for main buildings, and thirty-five (35) feet or more for accessory buildings.

(Amended "B" 6-22-15-Effective Upon Passage)

C. Each corner lot shall have a minimum width at the setback line of one hundred (100) feet.

D. The rear yard setback if facing a street shall be fifty (50) feet or more for both main and accessory buildings.

175-50

LEGEND

EXISTING INTERMEDIATE CONTOUR (330)
EXISTING INDEX CONTOUR (330)
EXISTING ROAD EDGE OF PAVEMENT
EXISTING ROAD CURB
EXISTING CONCRETE
EXISTING SIDEWALK
EXISTING DECK
EXISTING BUILDING
EXISTING FENCE
EXISTING VEGETATION
EXISTING STREAM
EXISTING WETLAND
EXISTING RAILROAD
EXISTING RAILROAD CENTERLINE
EXISTING WATERLINE
EXISTING WATERLINE EASEMENT
EXISTING STORM EASEMENT
EXISTING LOT LINE
PROPOSED ROW
PROPOSED LOT LINE
PROPOSED ROAD CENTERLINE
PROPOSED SWM FACILITY — SWM FACILITY

PROJECT INFORMATION

PARCEL IDENTIFICATION NO.	20-A-212-4
STREET ADDRESS:	1321 HAPPY CREEK ROAD
PROJECT SITE AREA:	42.99 ACRES
DISTURBED AREA:	42.99 ACRES
CURRENT ZONING:	R-S
CURRENT USE:	VACANT
PROPOSED ZONING:	R-1
PROPOSED USE:	RESIDENTIAL
MIN. LOT AREA:	10,000 SF
MIN. LOT WIDTH INTERIOR:	75 FT
MIN. LOT WIDTH CORNER:	100 FT
REQUIRED SETBACKS:	
FRONT:	35'
REAR:	30'
SIDE:	10' MIN. W/ MIN. TOTAL OF BOTH SIDES BEING NO LESS THAN 25'
PROVIDED SETBACKS:	
FRONT:	35'
REAR:	30'
SIDE:	10' MIN. W/ MIN. TOTAL OF BOTH SIDES BEING NO LESS THAN 25'
MAXIMUM BUILDING HEIGHT:	35' MAX
PROPOSED BUILDING HEIGHT:	35'
PARKING REQUIRED:	N/A
PARKING PROVIDED:	2 OFF-STREET SPACES PER LOT
REQUIRED OPEN SPACE:	N/A
PROVIDED OPEN SPACE:	7.57 ACRES OR 330,055 SF

DENSITY SUMMARY

ZONE	LOTS	ACRES	UNITS PER ACRES
R-1	104	42.99	2.42

151 Windy Hill Lane
Winchester, Virginia 22602
Telephone: (540) 722-8160
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GREENWAY ENGINEERING
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OFFICES IN: WINCHESTER, VA & MARTINSBURG, WV

GENERAL NOTES AND LEGEND

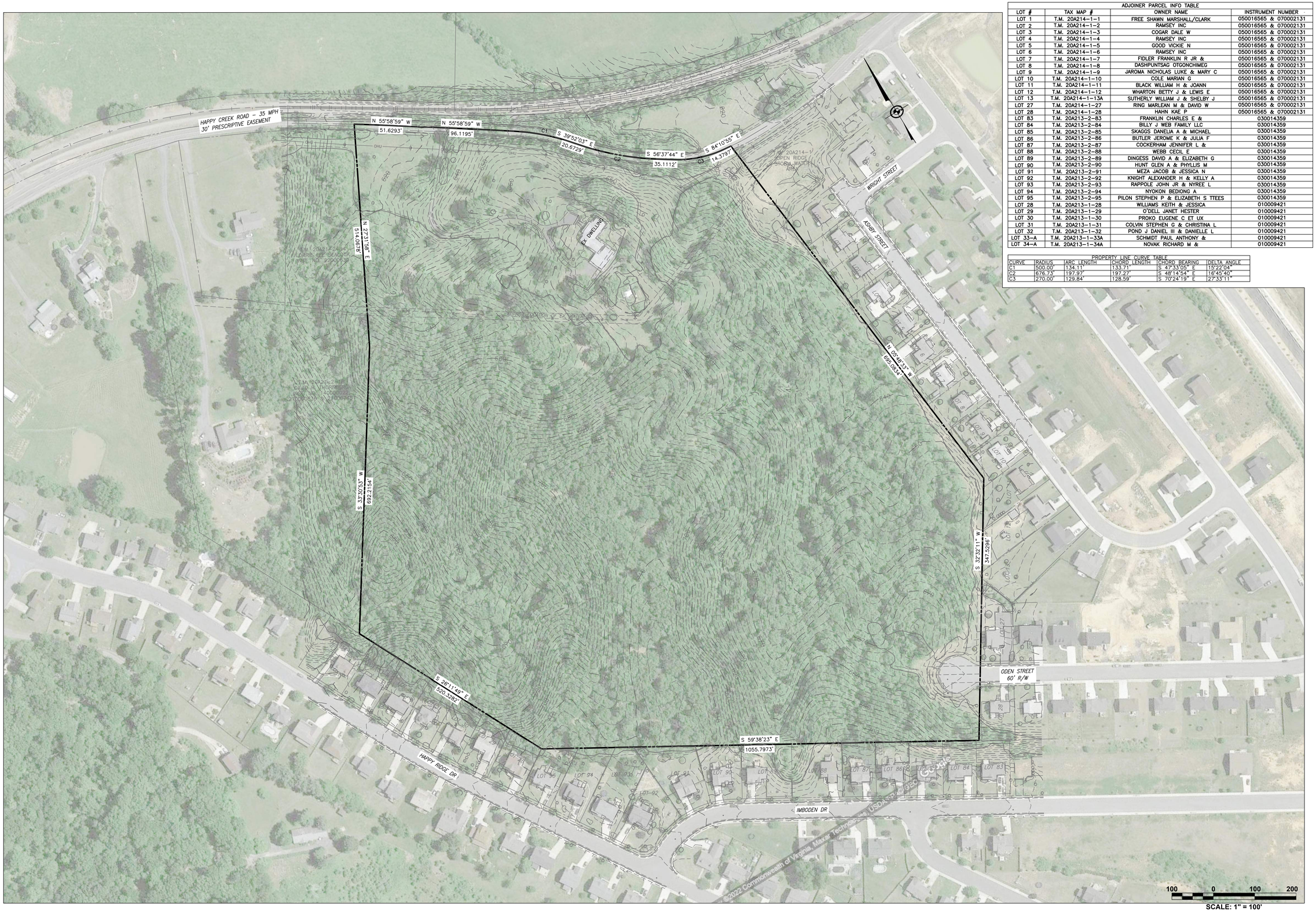
ASHTON GREEN

HAPPY CREEK MAGISTERIAL DISTRICT
TOWN OF FRONT ROYAL, VIRGINIA

Rev. No.	Date

COMMONWEALTH OF VIRGINIA
KEVIN A. SEWARD
Lic. No. 38586
04-05-2024
PROFESSIONAL ENGINEER

DATE: 04-05-2024
SCALE: N/A
DESIGNED BY: RAH/KAS
FILE NO. 6533R
SHEET 2 OF 5
DWG #



ADJOINER PARCEL INFO TABLE			
LOT #	TAX MAP #	OWNER NAME	INSTRUMENT NUMBER
LOT 1	T.M. 20A214-1-1	FREE SHAWN MARSHALL/CLARK	050016565 & 070002131
LOT 2	T.M. 20A214-1-2	RAMSEY INC	050016565 & 070002131
LOT 3	T.M. 20A214-1-3	COGAR DALE W	050016565 & 070002131
LOT 4	T.M. 20A214-1-4	RAMSEY INC	050016565 & 070002131
LOT 5	T.M. 20A214-1-5	GOOD VICKIE N	050016565 & 070002131
LOT 6	T.M. 20A214-1-6	RAMSEY INC	050016565 & 070002131
LOT 7	T.M. 20A214-1-7	FIDLER FRANKLIN R JR &	050016565 & 070002131
LOT 8	T.M. 20A214-1-8	DASHPUNTSAG OTGONCHIMEG	050016565 & 070002131
LOT 9	T.M. 20A214-1-9	JAROMA NICHOLAS LUKE & MARY C	050016565 & 070002131
LOT 10	T.M. 20A214-1-10	COLE MARIAN G	050016565 & 070002131
LOT 11	T.M. 20A214-1-11	BLACK WILLIAM H & JOANN	050016565 & 070002131
LOT 12	T.M. 20A214-1-12	WHARTON BETTY J & LEWIS E	050016565 & 070002131
LOT 13	T.M. 20A214-1-13A	SUTHERLY WILLIAM J & SHELBY J	050016565 & 070002131
LOT 27	T.M. 20A214-1-27	RING MARLEAN M & DAVID W	050016565 & 070002131
LOT 28	T.M. 20A214-1-28	HAHN KAE P	050016565 & 070002131
LOT 83	T.M. 20A213-2-83	FRANKLIN CHARLES E &	030014359
LOT 84	T.M. 20A213-2-84	BILLY J WEB FAMILY LLC	030014359
LOT 85	T.M. 20A213-2-85	SKAGGS DANELIA A & MICHAEL	030014359
LOT 86	T.M. 20A213-2-86	BUTLER JEROME K & JULIA F	030014359
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LOT 29	T.M. 20A213-1-29	O'DELL JANET HESTER	010009421
LOT 30	T.M. 20A213-1-30	PROKO EUGENE C ET UX	010009421
LOT 31	T.M. 20A213-1-31	COLVIN STEPHEN C & CHRISTINA L	010009421
LOT 32	T.M. 20A213-1-32	POND J DANIEL III & DANIELLE L	010009421
LOT 33-A	T.M. 20A213-1-33A	SCHMIDT PAUL ANTHONY &	010009421
LOT 34-A	T.M. 20A213-1-34A	NOVAK RICHARD M &	010009421

PROPERTY LINE CURVE TABLE					
CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	500.00'	134.11'	133.71'	S 47°33'05" E	15°22'04"
C2	676.73'	197.97'	197.27'	S 48°14'54" E	16°45'40"
C3	270.00'	129.84'	128.59'	S 70°24'19" E	27°33'11"

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FND 1971

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OFFICES IN: WINCHESTER, VA & MARTINSBURG, WV

EXISTING CONDITIONS

ASHTON GREEN

HAPPY CREEK MAGISTERIAL DISTRICT
TOWN OF FRONT ROYAL, VIRGINIA

Rev. No.	Date

COMMONWEALTH OF VIRGINIA
KEVIN A. SEWARD
Lic. No. 38586
04-05-2024
PROFESSIONAL ENGINEER

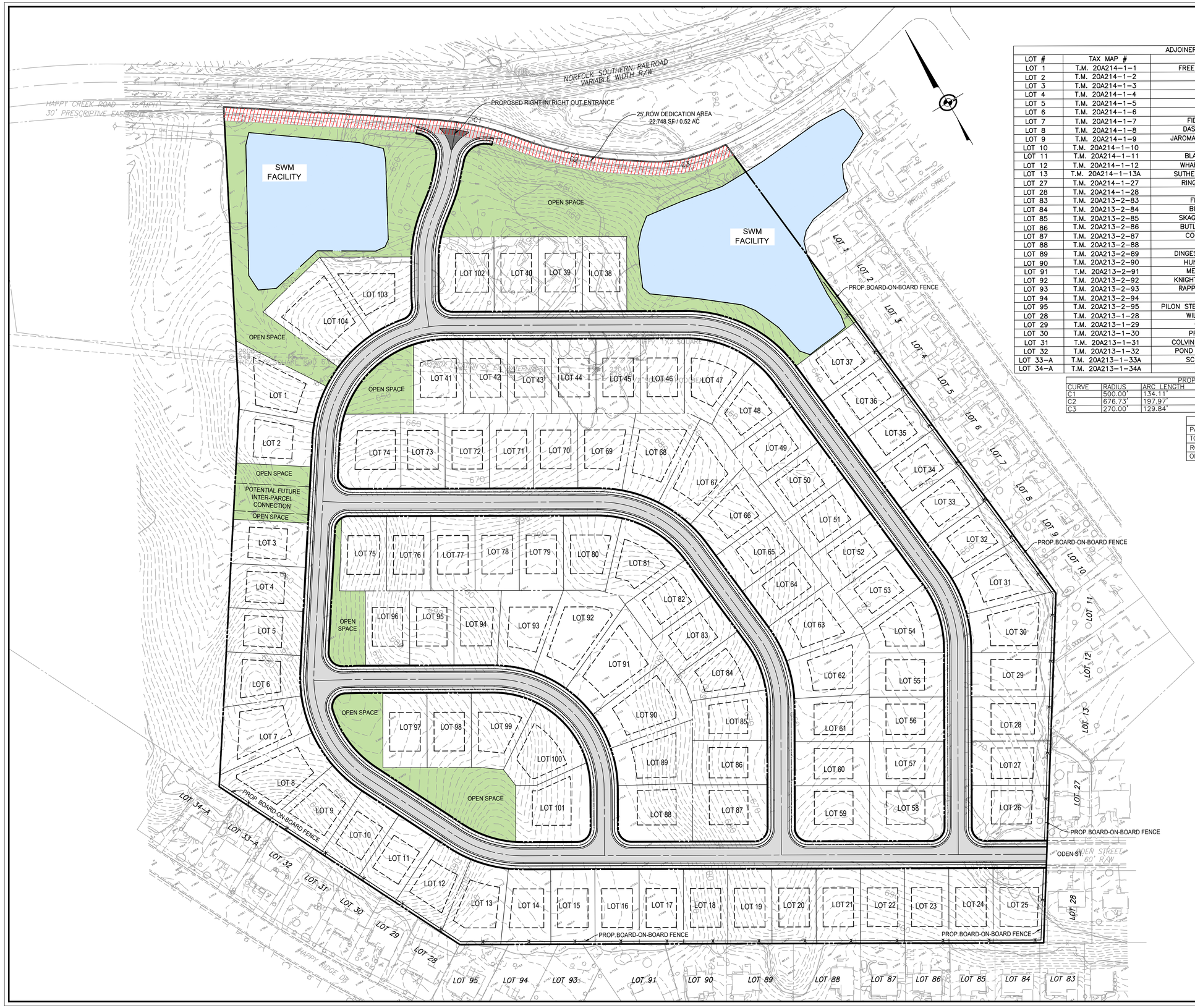
DATE: 04-05-2024

SCALE: AS SHOWN

DESIGNED BY: RAH/KAS

FILE NO. 6533R

SHEET 3 OF 5



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C3	270.00'	129.84'	128.59'	S 70°24'19" E	27°33'11"

AREA CALCULATIONS
PARCEL BOUNDARY=42.99 AC/1,872,807 SF
TOTAL LOT AREA=27.68 AC/1,205,740 SF
ROW AREA=7.21 AC/314,067 SF
OPEN SPACE AREA=7.57 AC/330,055 SF

LOT DENSITY			
ZONE	LOTS	ACRES	UNITS PER ACRES
R-1	104	42.99	2.42

LEGEND

- ROW DEDICATION AREA
- SWM FACILITY
- OPEN SPACE

151 Windy Hill Lane
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GREENWAY ENGINEERING

Concept Layout Plan

ASHTON GREEN

HAPPY CREEK MAGISTERIAL DISTRICT
TOWN OF FRONT ROYAL, VIRGINIA

COMMONWEALTH OF VIRGINIA
KEVIN A. SEWARD
Lic. No. 38586
04-05-2024
PROFESSIONAL ENGINEER

DATE:	04-05-2024
SCALE:	1" = 80'
DESIGNED BY:	RAH/KAS
FILE NO.	6533R
SHEET	4 OF 5

DATE: 04-05-2024	COMMONWEALTH OF VIRGINIA KEVIN A. SEWARD Lic. No. 38586 04-05-2024 PROFESSIONAL ENGINEER	Concept Illustrative Plan ASHTON GREEN HAPPY CREEK MAGISTERIAL DISTRICT TOWN OF FRONT ROYAL, VIRGINIA	GREENWAY ENGINEERING FND 1971 151 Windy Hill Lane Winchester, Virginia 22602 Telephone: (540) 662-4185 Fax: (540) 722-9528 www.greenwayeng.com
SCALE: 1" = 80'			
DESIGNED BY: RAH/KAS			
FILE NO. 6533R			
SHEET 5 OF 5			

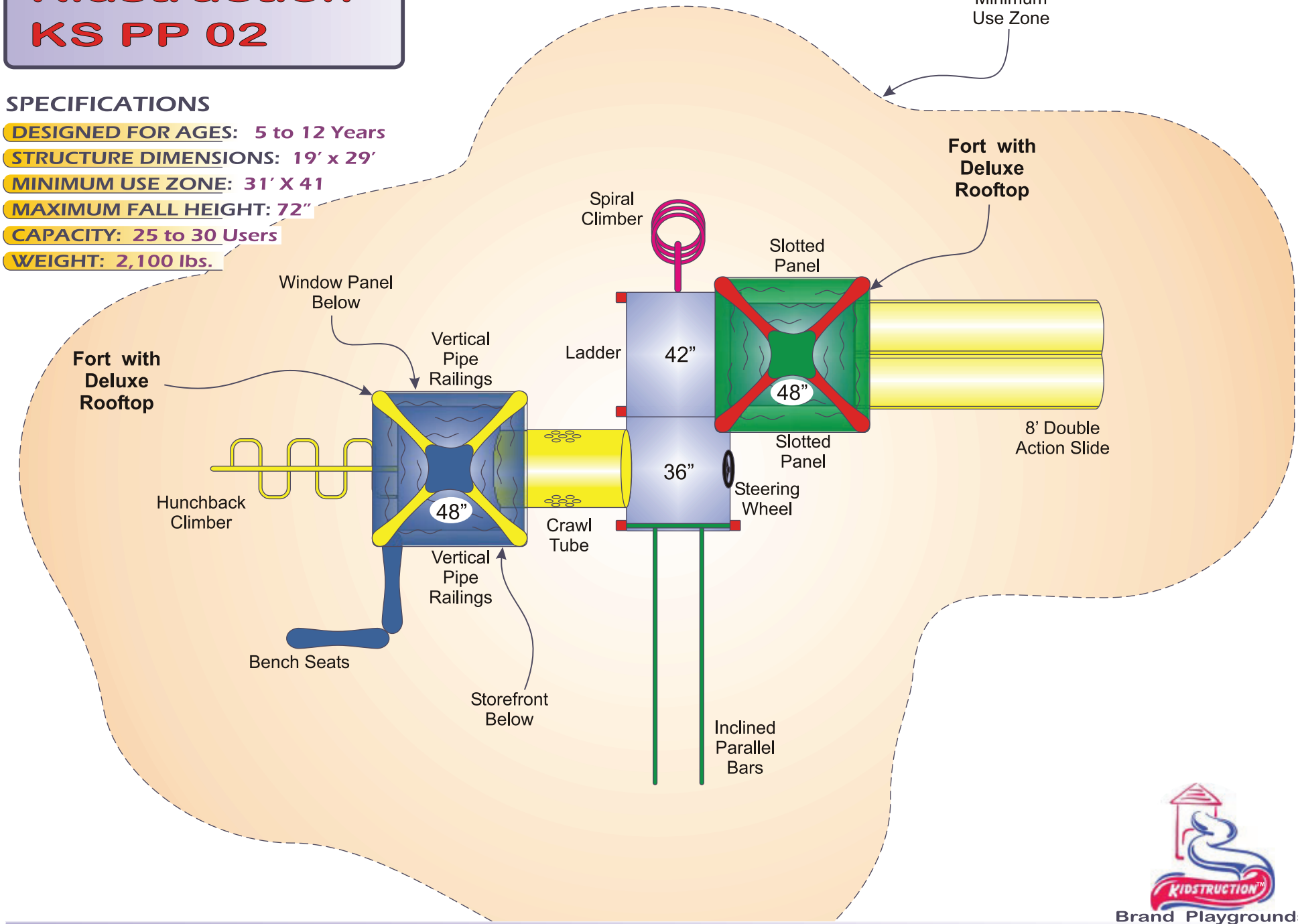
Exhibit B

Playground Equipment

Kidstruction™ KS PP 02

SPECIFICATIONS

- DESIGNED FOR AGES: 5 to 12 Years
- STRUCTURE DIMENSIONS: 19′ x 29′
- MINIMUM USE ZONE: 31′ X 41
- MAXIMUM FALL HEIGHT: 72″
- CAPACITY: 25 to 30 Users
- WEIGHT: 2,100 lbs.



Brand Playgrounds

© Playground and Shade Structures, Inc. www.kidstruction.com

Kidstruction™
KS PP 02

Brand Playgrounds

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KS PP 02

Brand Playgrounds

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EXHIBIT C

Proposed Elevations

PRODUCT ANALYSIS SHEET

Saint Lawrence

GENERAL FEATURES

Home Type: Single Family Detached

Series: Ryan Core

Footprint Min: 50′ x 42′-0″

Footprint Max: 62′-4′′ x 54′-4″

Mean Roof Height: 24′-4 1/4″

Ceiling Height: 9′-1 1/8″ First Floor
7′-11″ Basement & 8′-1 1/8″Second Floor

Base Square Footage: 3082
1st Floor: 1408
2nd Floor: 1674

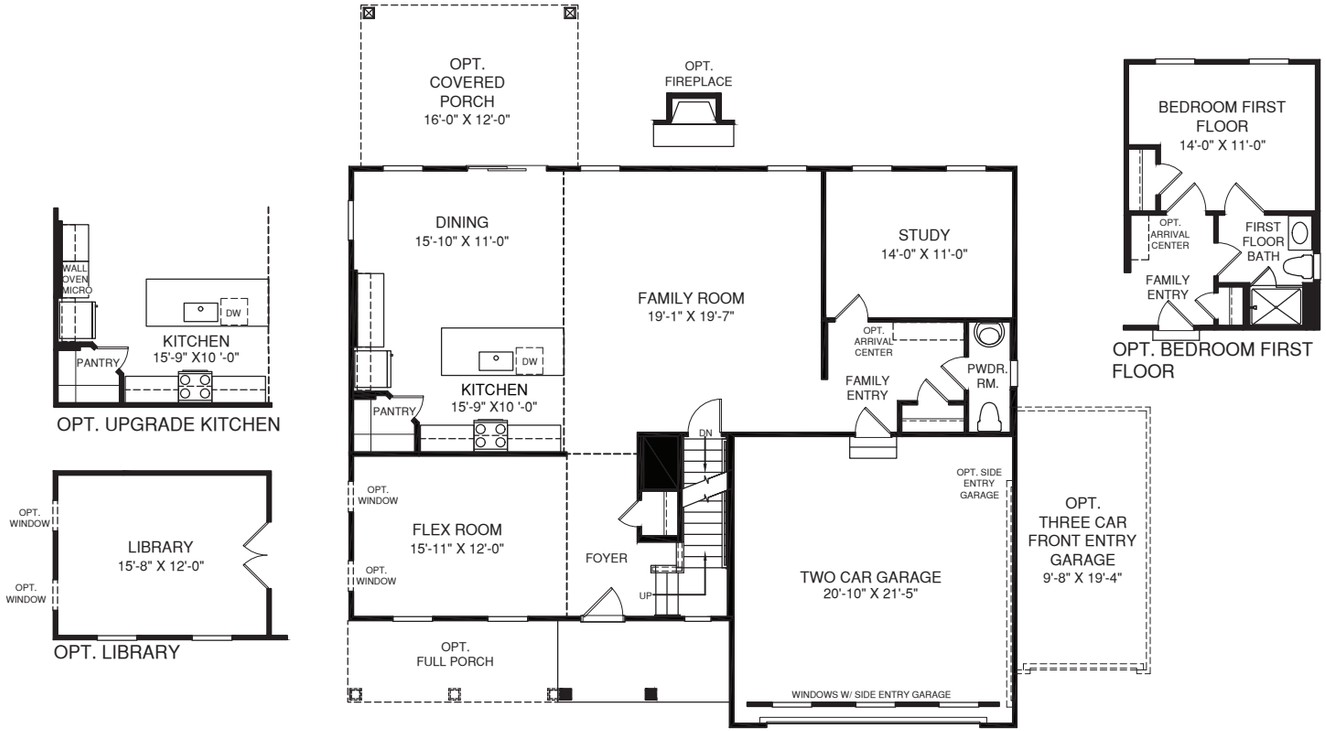
Available Foundations: Basement; Crawl, Slab

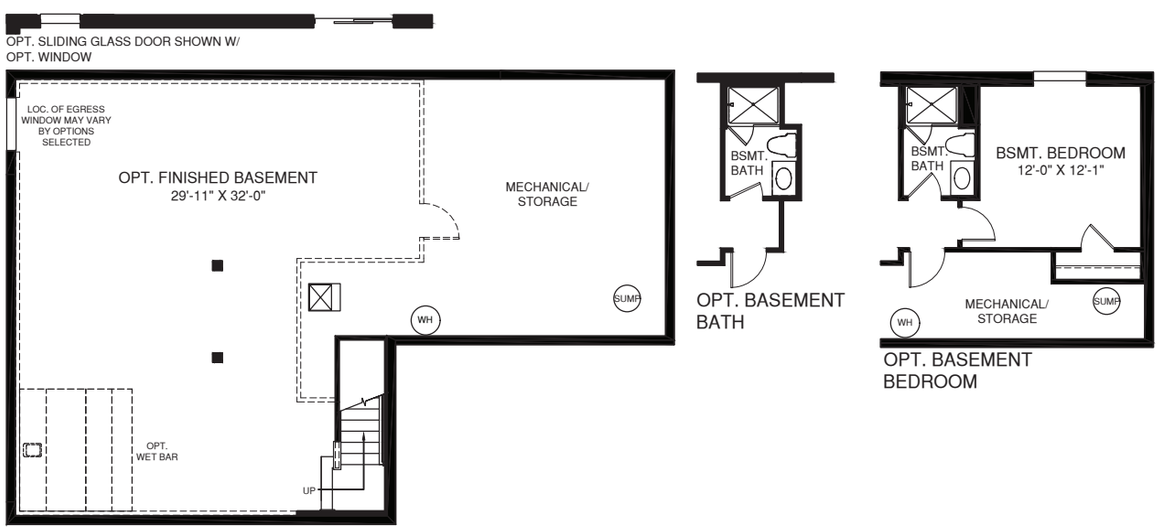
Garage Type: 2-car front or side entry; 3-car front entry

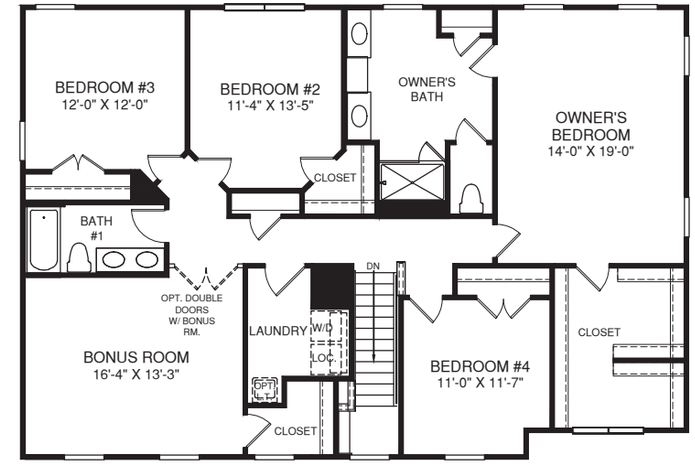
Veneers Available: Traditional full siding or full brick, partial brick & partial stone; Craftsman with stone or brick water table

SLR00-01

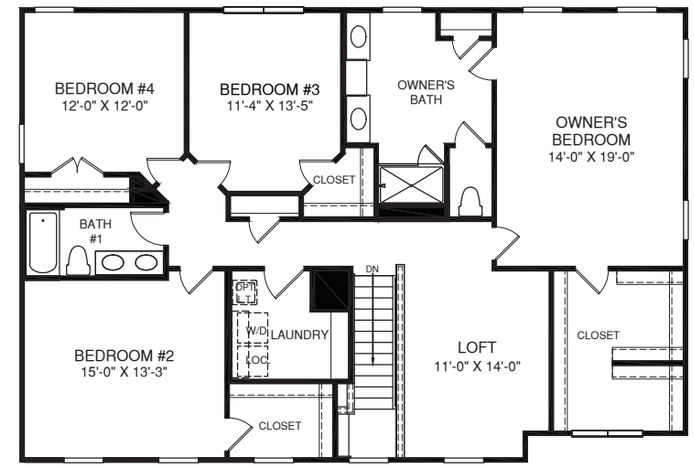
For Internal Use only. Information is believed to be correct at time of publication. Refer to most current blueprints for accuracy.

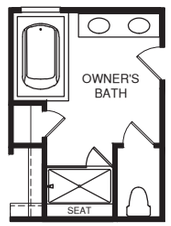




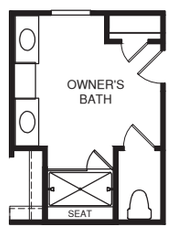


OPT. FOUR BEDROOM W/ BONUS ROOM

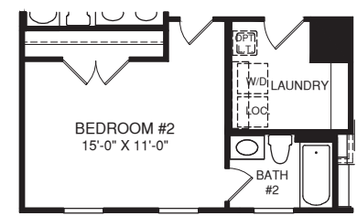




OPT. OWNER'S BATH W/ SOAKING TUB & SHOWER



OPT. OWNER'S BATH W/ ROMAN SHOWER



OPT. BATH #2

SLR00-01 Saint Lawrence

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PRODUCT ANALYSIS SHEET

Roanoke

GENERAL FEATURES

Home Type: Single Family Detached

Series: Ryan Core

Footprint Min: 50′ x 41′-0″

Footprint Max: 62′-8′′ x 53′-8″

Mean Roof Height: 24′-4 1/8″

Ceiling Height: 9′-1 1/8″ First Floor
7′-11″ Basement & 8′-1 1/8″Second Floor

Base Square Footage: 2756
1st Floor: 1272
2nd Floor: 1484

Available Foundations: Basement; Crawl, Slab

Garage Type: 2-car front or side entry; 3-car front entry

Veneers Available: Traditional full siding or full brick, partial brick & partial stone; Craftsman with stone or brick water table

RNK00-01

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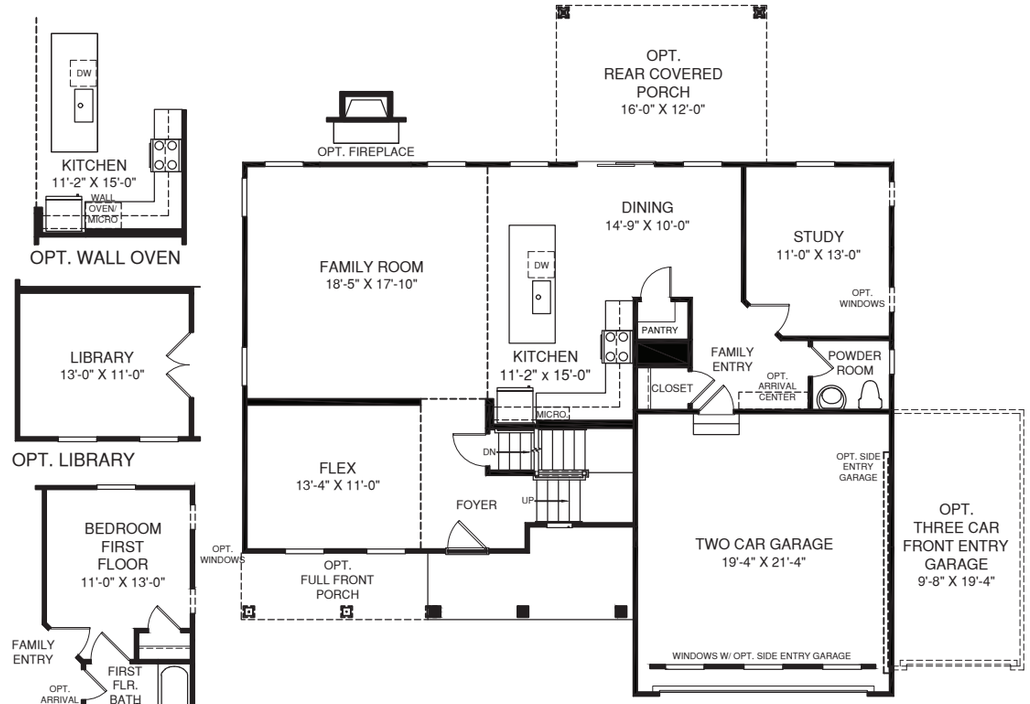
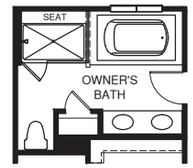
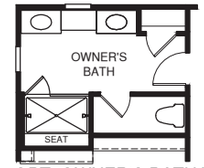
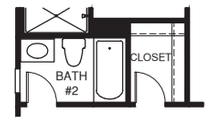




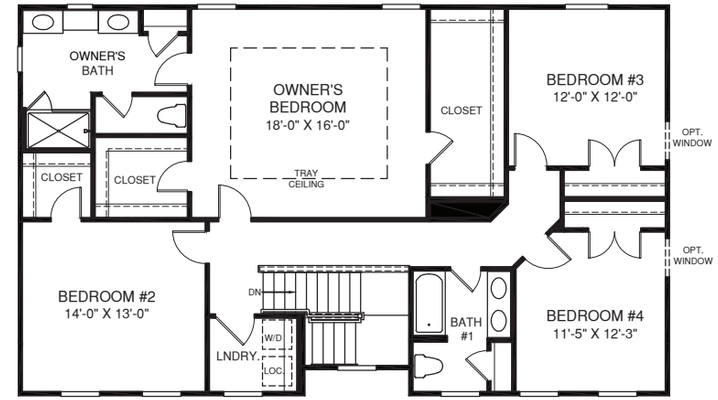
OPT. OWNER'S BATH W/ SOAKING TUB & SHOWER

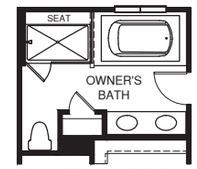


OPT. OWNER'S BATH W/ ROMAN SHOWER



OPT. BATH #2





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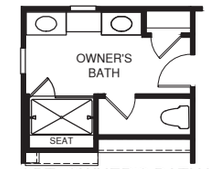
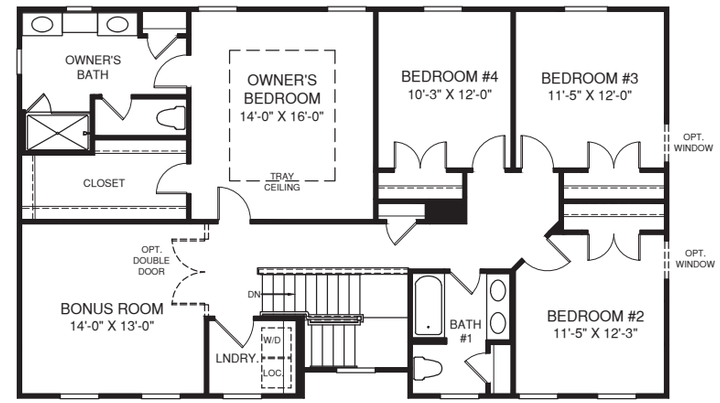
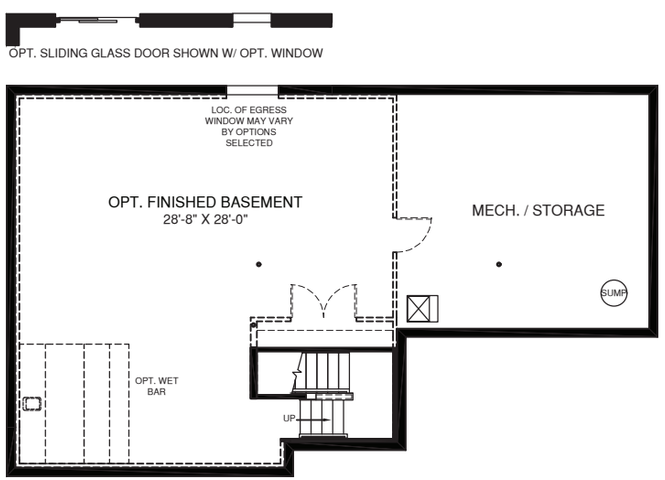
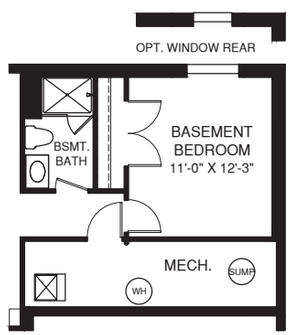


OPT. OWNER'S BATH W/ ROMAN SHOWER







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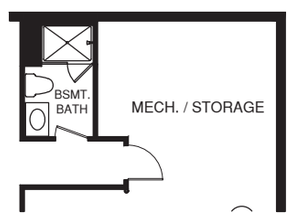

OPT. BASEMENT BATH

RNK00-01 Roanoke

For Internal Use only. Information is believed to be correct at time of publication. Refer to most current blueprints for accuracy.

EXHIBIT D

Wetland Delineation Report

Wetland Delineation Report

1321 Happy Creek Road
Front Royal

Warren County, Virginia

March 8, 2024

Prepared for:
Rappahannock Development Group
Chris Hornung

Prepared By:
Stephen White, LPSS
Greenway Engineering, Inc.

151 Windy Hill Lane
Winchester, VA 22602
Telephone 540-662-4185
Fax 540-722-4185
www.greenwayeng.com

File #6533R//SW

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Executive Summary

The waters of the U.S., including wetlands, identified during this investigation of 1321 Happy Creek Road project were delineated by Greenway Engineering (Greenway) in accordance with 33 CFR Part 328 – *Definition of Waters of the United States*, the 1987 *Corps of Engineers' Wetlands Delineation Manual* (the Manual)[1], and the Regional Supplement to the Manual (the Supplement)[2], and represent those areas that are most likely within the regulatory purview of the U.S. Army Corps of Engineers (USACE) and/or state agencies. The delineation of surface waters described by this report and plans constitutes an assessment of features at the site at the time of our site visits during the month of December 2023 and does not represent conditions which may exist in the future. This report outlines the review of the published resource materials, existing site conditions, and the results of the field investigation. This report does not represent a legal jurisdictional determination and any federally jurisdictional or isolated waters and wetlands which may be delineated for this project, and conversely the absence of said waters and wetlands, must be confirmed by the USACE. It is strongly recommended that the USACE be consulted in an effort to gain written confirmation of the delineation described by this report prior to engaging in any design or construction on the property described herein.

The appropriate permits must be obtained from the federal and/or state regulatory agencies prior to any proposed impacts to waters of the U.S./Commonwealth.

Project Contacts

Greenway Engineering, Inc
Stephen White
151 Windy Hill Lane
Winchester, VA 22602
540-662-4185
sjwhite@greenwayeng.com

Rappahannock Development Group
Chris Hornung
1016 Charles Street
Fredericksburg, Va. 22401

[1] Environmental Laboratory. (1987). "Corps of Engineers Wetlands Delineation Manual." Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

[2] U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont*, ed. J.S. Wakeley, R.W. Lickvar, and C.W. Noble. ERDC/EL TR-09-19 Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Project Description

The 1321 Happy Creek Road project described herein is located in Front Royal, VA in the central portion of Warren County. The project is located off Happy Creek Road and is situated on tax parcel 20A212-4 and is approximately 41.1 acres in size. The project consists of mostly hardwood forests with some open, grassy areas around the existing residential house. The proposed project consists of residential land development. The approximate center coordinates are 38.9259N latitude and -78.1589W longitude. The property is located within the Shenandoah area identified by Hydrologic Unit Code 02070007.

See Appendix B for an aerial overview of the project area.

Methodology

The Manual outlines a three-parameter approach to identifying wetlands: dominant hydrophytic vegetation, hydric soils, and indicators of surface and subsurface hydrology. All three parameters must be present for an area to be considered a jurisdictional wetland in accordance with these criteria, unless determined to be a "difficult wetland situation" as outlined in the Manual.
Any waters of the U.S. identified in this Project were classified according to the Cowardin System, as described in *Classification of Wetlands and Deepwater Habitats of the United States* (1979). This is a hierarchical system, which aids resource managers and others by providing uniformity of concepts and terms used to define wetlands according to hydrologic, geomorphologic, chemical, and biological factors.

Desktop Evaluation

Greenway Engineering performed a preliminary evaluation using available map resources prior to the field investigation. These resources included, but may not be limited to:

- Warren County Soil Survey (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey. Available online at: http://websoilsurvey.nrcs.usda.gov/)

- USGS 7.5' Quadrangle, Front Royal VA. (United States Department of the Interior, United States Geological Service, Washington, DC. Available online at: http://www.usgs.gov/)

- GIS data provided by the Warren County VA GIS Department.

- National Wetlands Inventory (United States Department of the Interior, United States Fish and Wildlife Service, Washington, DC. Available online at: http://www.fws.gov/)

The National Wetlands Inventory Map (NWI) identifies a potential stream in the northwestern corner of the property. There are no FEMA floodplains mapped on the property. See Appendix C for the Hydrography Map identifying the NWI Wetlands and County GIS hydrography data.

The soils, vegetation, and hydrology conditions are described in more detail in the following sections.

Soils

The National Technical Committee for Hydric Soils defines a hydric soil as a "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Hydric soil indicators are defined in the latest version of Field Indicators of Hydric Soils in the United States.[3] A hydric soil may also be identified by listing in The National List of Hydric Soils, published by the USDA Soil Conservation Service, and state and local hydric soils lists.

The Soil Survey of Warren County, Virginia was accessed through the Web Soil Survey on the Natural Resources Conservation Service (NRCS) website.

The following table summarizes the mapped soils within the project area. (see Appendix D for the Soils Map)

[3] *United States Department of Agriculture, Natural Resources Conservation Service. 2016. Field Indicators of Hydric Soils in the United States, Version 8.0. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils*

Table 1: Soil Summary Table

Warren County, Virginia

Symbol	Map Unit Name
17B	DRAYKE LOAM, 2 TO 7 PERCENT SLOPES
17C	DRAYKE LOAM, 7 TO 15 PERCENT SLOPES
19B	HAWKSBILL COBBLY LOAM, 2 TO 7 PERCENT SLOPES, OCCASSIONALLY FLOODED
21D	LEW CHANNERY LOAM, 7 TO 25 PERCENT SLOPES
39C	UNISON LOAM, 7 TO 15 PERCENT SLOPES

During the field investigation, soil pits were dug to describe soil morphological characteristics. Soil characteristics including texture, color (hue, value, and chroma), and odor were inspected for each sample. *Munsell Soil Color Charts* were used for determining the moist soil color. In order for the soil to be considered hydric, it must meet the definition of a hydric soil, which is "a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (USDA Soil Conservation Service 1994). Hydric soil indicators assist in identifying hydric soils, but an indicator is not required to be present as long as the definition is met, unless determined to be a "difficult wetland situation" as outlined in the Manual. The Results section of this report describes the soils onsite in more detail and also on the attached Data Sheets (Appendix F).

Vegetation

Plant species observed on the site were identified and the wetland indicator status for each species was determined from the 2020 *National Wetland Plant List* (U.S. Army Corps of Engineers 2020. National Wetland Plant List, version 3.5 https://wetland-plants.usace.army.mil/). Table 2 provides the definition for each plant indicator category. In order for the vegetation parameter to be met, the vegetation must meet the rapid test, dominance test, prevalence index, or morphological adaptation definition. Each of these tests is outlined in the Manual. Typically, if more than 50% of the dominant plant species are listed as FAC or wetter, then the hydrophytic vegetation condition is met, unless determined to be a "difficult wetland situation" as outlined in the Manual.

Table 2: Plant Indicator Status

Plant Indicator Category	Indicator Symbol	Definition
Obligate Wetland	OBL	Plants that always occur in standing water or in saturated soils
Facultative Wetland	FACW	Plants that nearly always occur in areas of prolonged flooding or require standing water or saturated soils but may, on rare occasions, occur in non-wetlands
Facultative	FAC	Plants that occur in a variety of habitats, including wetland and mesic to xeric non-wetland habitats but commonly occur in standing water or saturated soils
Facultative Upland	FACU	Plants that typically occur in xeric or mesic non-wetland habitats but may frequently occur in standing water or saturated soils
Obligate Upland	UPL	Plants that rarely occur in water or saturated soils

The vegetation is described in more detail in the Results section of this report and also on the attached Data Sheets (Appendix F).

Hydrology

The Manual and Supplement state that wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils that are saturated to the surface at some time during the growing season. Hydrologic indicators include, but are not limited to, sediment deposits, visual inundation, drift lines, soil erosion, and hummocking. Evidence of these indicators is present even during dry periods, and therefore are useful indicators of wetland hydrology. One primary indicator of hydrology or two secondary indicators must be present for this condition to be met, unless determined to be a "difficult wetland situation" as outlined in the Manual. See Appendix C for Hydrography maps that include NWI, Streams, and Floodplain maps from available GIS data.

The Results section of this report describes the hydrology for each wetland area and also on the attached Data Sheets (Appendix F).

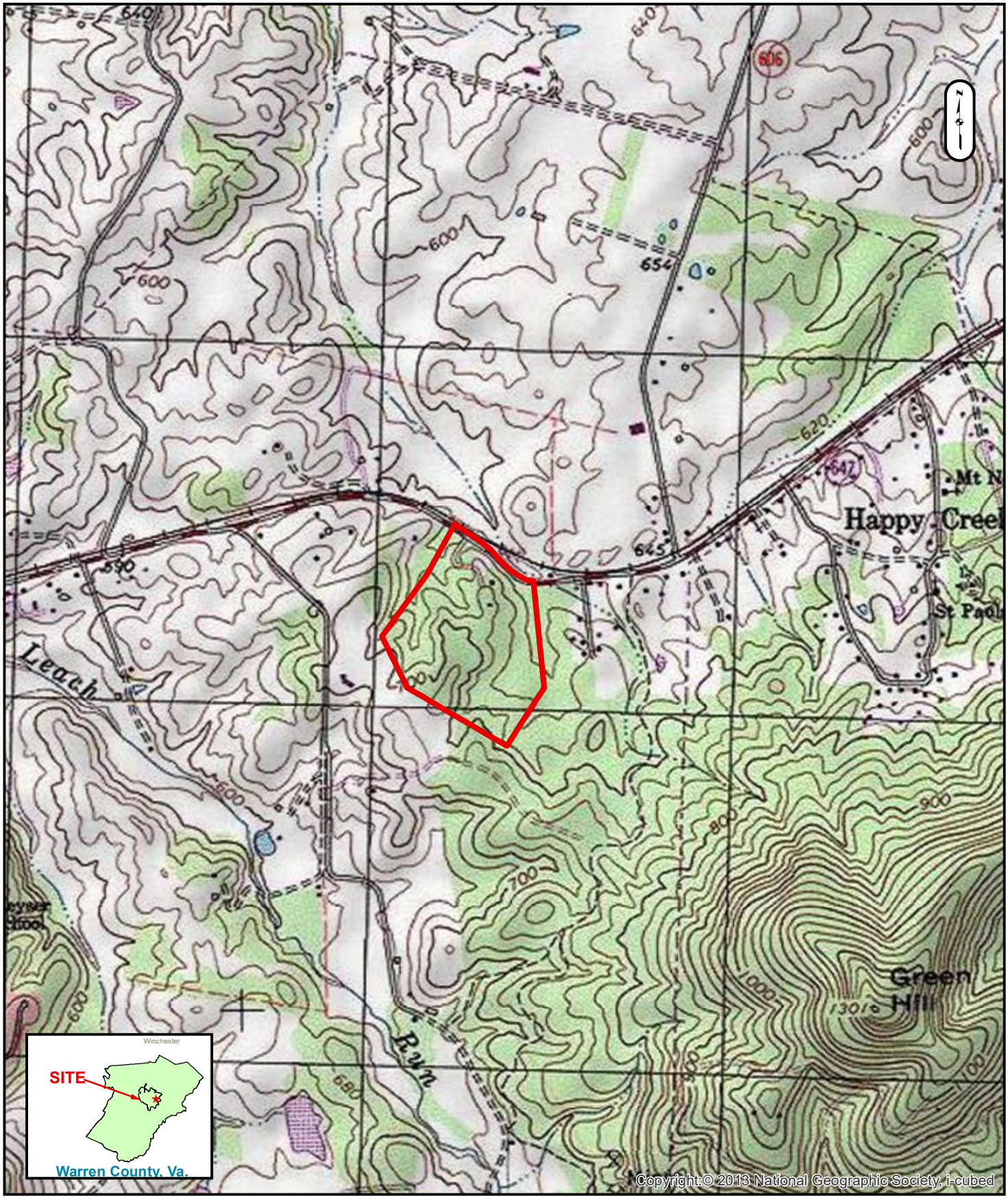
Results

There were no potential regulated waters, including wetlands, that were identified during this delineation. This is subject to confirmation by the USACE and/or the Virginia Department of Environmental Quality (DEQ). Three data points were evaluated within concave drainage swales, and none showed any criteria for wetlands. There were no suspect or wet areas observed during the site evaluation.

Table 3: Data Point Summary Table

Data Point	Mapped Soil Unit	Hydrophytic Vegetation	Wetland Hydrology	Hydric Soils	Community ID
DP1	17C	No	No	No	Upland Forest
DP2	17C	No	No	No	Upland Forest
DP3	39C	No	No	No	Upland Forest

Appendix A:
USGS Quadrangle Map



GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 6533R

LEGEND

Subject Parcel

1 Inch = 1,200 Feet

0 1,200 2,400 Ft.

APPENDIX A: USGS QUAD FRONT ROYAL

1321 HAPPY CREEK ROAD

WETLAND DELINEATION REPORT

LOCATION: WARREN COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix B:
Aerial Photograph

GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 6533R

LEGEND

Subject Parcel

1 Inch = 400 Feet

0 400 800 Ft.

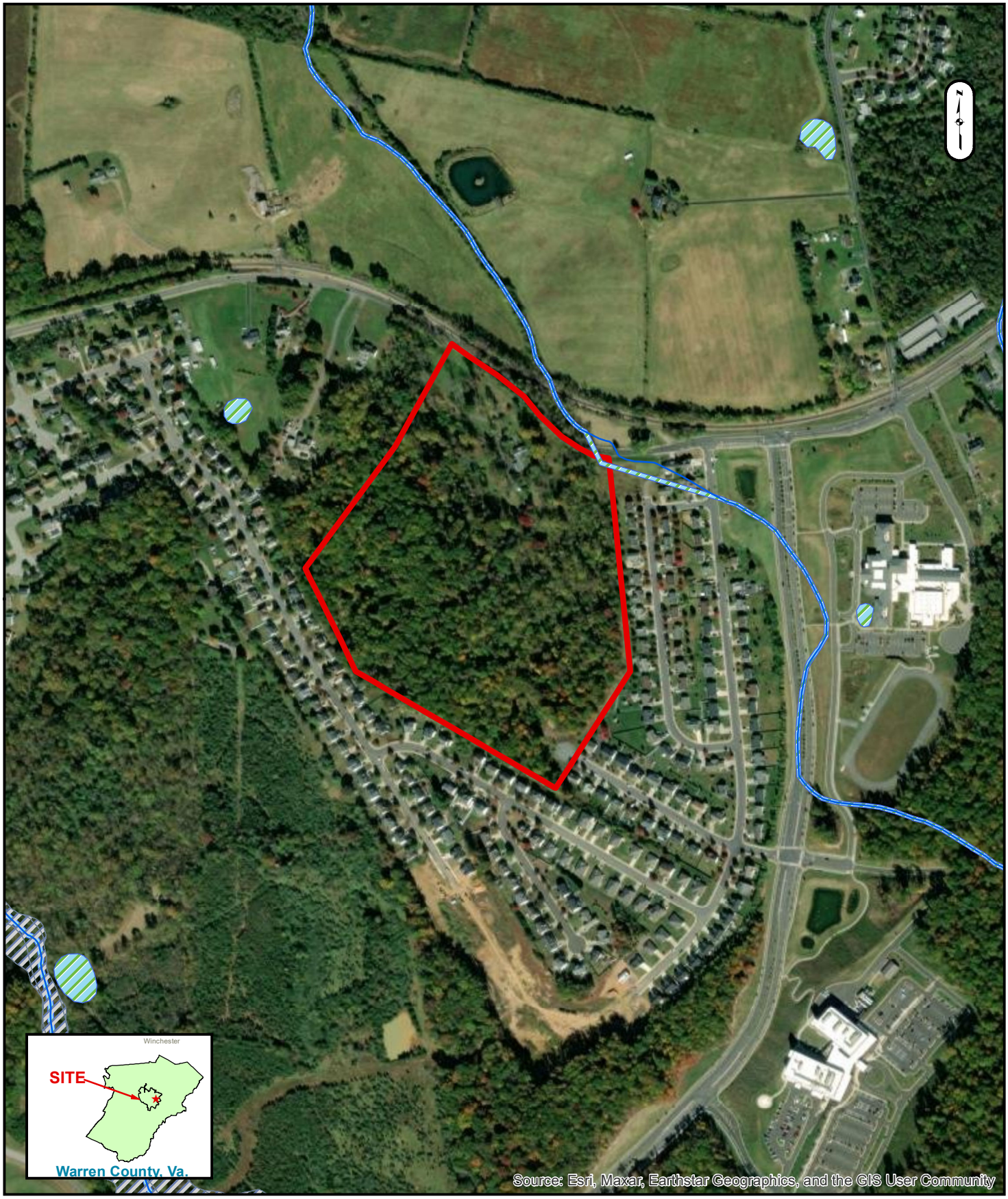
APPENDIX B: AERIAL OVERVIEW

1321 HAPPY CREEK ROAD
WETLAND DELINEATION REPORT

LOCATION: WARREN COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix C:
Hydrography Map



GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 6533R

LEGEND

- Subject Parcel
- Streams (GIS Data)
- 100 Year Floodplain
- Wetlands (NWI Data)

1 Inch = 600 Feet | 0 | 600 | 1,200 Ft.

APPENDIX C: HYDROGRAPHY MAP

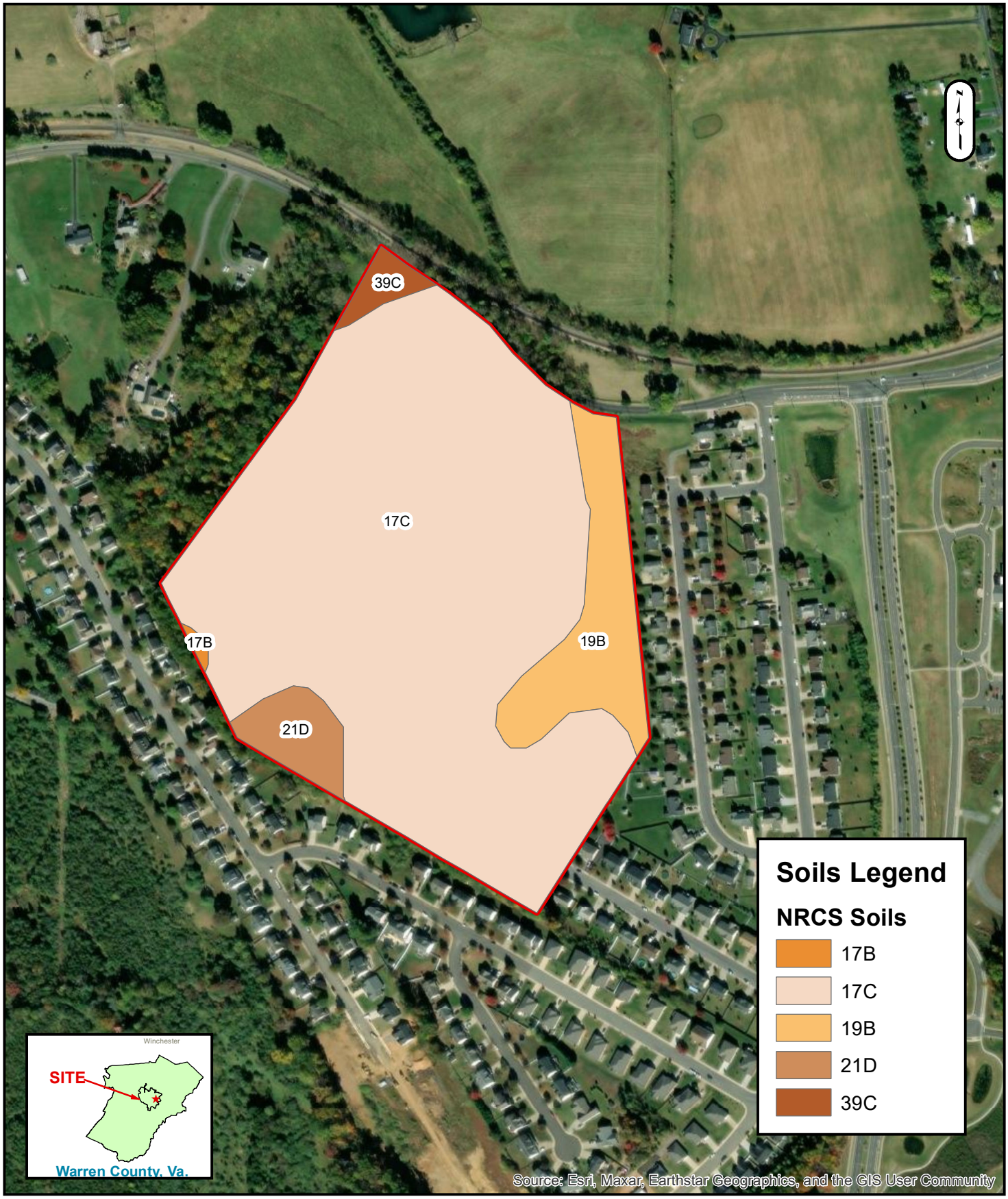
1321 HAPPY CREEK ROAD

WETLAND DELINEATION REPORT

LOCATION: WARREN COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix D:
NRCS Soils Map



GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 6533R

LEGEND

Subject Parcel

1 Inch = 400 Feet | 0 | 400 | 800 Ft.

APPENDIX D: SOILS MAP

1321 HAPPY CREEK ROAD
WETLAND DELINEATION REPORT

LOCATION | WARREN COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix E:
Wetland Delineation Map

GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 6533R

LEGEND

Data Point

1 Inch = 300 Feet | 0 | 300 | 600 Ft.

APPENDIX E: DELINEATION MAP

1321 HAPPY CREEK ROAD

WETLAND DELINEATION REPORT

LOCATION: WARREN COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix F:
Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: 1321 Happy Creek Road City/County: Warren Sampling Date: 11/16/2023

Applicant/Owner: Rappahannock Development Group State: VA Sampling Point: DP2

Investigator(s): SW Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 38.927138 Long: -78.159321 Datum: NAD 83

Soil Map Unit Name: Drayke Loam, 7 TO 15 PERCENT SLOPES NWI classification: _____

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? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (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 within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: DP2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		

Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 30)			
1. Solidago altissima	30	Yes	FACU
2. Rubus phoenicolasius	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1- Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 4/3	100					L	
3-14	7.5YR 5/6	90					CL	
	10YR 5/3	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal Prairie Redox (A16) (MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: 1321 Happy Creek Road City/County: Warren Sampling Date: 11/16/2023

Applicant/Owner: Rappahannock Development Group State: VA Sampling Point: DP2

Investigator(s): SW Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 38.927138 Long: -78.159321 Datum: NAD 83

Soil Map Unit Name: Drayke Loam, 7 TO 15 PERCENT SLOPES NWI classification: _____

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? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (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 within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: DP2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		

Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 30)			
1. Solidago altissima	30	Yes	FACU
2. Rubus phoenicolasius	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1- Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 4/3	100					L	
3-14	7.5YR 5/6	90					CL	
	10YR 5/3	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal Prairie Redox (A16) (MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: 1321 Happy Creek Road City/County: Warren Sampling Date: _____

Applicant/Owner: Rappahannock Development Group State: VA Sampling Point: DP3

Investigator(s): SW Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 38.928805 Long: -78.159745 Datum: NAD 83

Soil Map Unit Name: UNISON LOAM, 7 TO 15 PERCENT SLOPES NWI classification: _____

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? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (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 within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: DP3

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Robinia pseudoacacia	20	Yes	FACU
2. Juglans nigra	30	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	

Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 30)			
1. mowed grass			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		= Total Cover	

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1- Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 4/3	100					L	
3 - 14	10YR 5/8	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal Prairie Redox (A16) (MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Appendix G:
Project Area Photographs

Photo 1: Entrance to property off Oden Street. Photo facing West.

Photo 2: General overview of property. Photo facing East.

Photo 3: Soil profile at Data Point 1.

Photo 4: Location of Data Point 1. Photo facing East.

Photo 5: Soil profile at Data Point 2.

Photo 6: Location of Data Point 2. Photo facing North.

Photo 7: Soil profile at Data Point 3.

Photo 8: Location of Data Point 3. Photo facing North.

Photo 9: General overview of property. Photo facing South.

Photo 10: General overview of property. Photo facing East.

Photo 11: General overview of property. Photo facing East.

Photo 12: General overview of property. Photo facing North.

Photo 13: General overview of property. Photo facing Northwest.

Photo 6: General overview of property. Photo facing South.

Photo 7: General overview of property. Photo facing East.

Photo 8: General overview of property. Photo facing South.

EXHIBIT E

Phase 1 ESA

PHASE I ENVIRONMENTAL SITE ASSESSMENT

HAPPY CREEK ROAD PARCEL

1321 HAPPY CREEK ROAD
FRONT ROYAL, VIRGINIA 22630

ECS PROJECT NO. 47:15516-A

FOR: RAPPAHANNOCK DEVELOPMENT GROUP

OCTOBER 30, 2023

October 30, 2023

Walton Mahon
Rappahannock Development Group
1016 Charles Street
Fredericksburg, Virginia 22401

ECS Project No. 47: 15516-A

Reference: Phase I Environmental Site Assessment Report, Happy Creek Road Parcel, 1321 Happy Creek Road, Front Royal, Warren County, Virginia 22630

Dear Mr. Mahon:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide you with the results of our Phase I Environmental Site Assessment (ESA) for the referenced site. ECS's services were provided in general accordance with ECS Proposal No. 47:29766-EP authorized on September 28, 2023 and generally meet the requirements of ASTM E1527-21, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, and in accordance with EPA Standards and Practices for All Appropriate Inquiries contained in 40 CFR Part 312.

If there are questions regarding this report, or a need for further information, please contact the undersigned.

Sincerely,

ECS Mid-Atlantic, LLC

Allison Popp
Environmental Scientist
apopp@ecslimited.com
703-471-8400

Christopher M. Elliott, CHMM
Environmental Principal
celliott@ecslimited.com
703-471-8400

Project Summary

Happy Creek Road Parcel
1321 Happy Creek Road
Front Royal, Virginia 22630

Report Section		No Further Action	REC	CREC	HREC	BER	Comment
4.0	User Provided Information	✔					
5.1	Federal ASTM Databases	✔					
5.2	State ASTM Databases	✔					
5.3	Additional Environmental Record Sources	✔					
6.0	Historical Use Information	✔					
7.0	Site and Area Reconnaissance	✔					
8.0	Additional Services	✔					
9.0	Interviews	✔					

ENVIRONMENTAL PROFESSIONAL STATEMENT

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Christopher M. Elliott, CHMM
Environmental Principal
October 30, 2023

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1.0 EXECUTIVE SUMMARY

ECS Mid-Atlantic, LLC (ECS) was contracted by Rappahannock Development Group to perform an ASTM International (ASTM) E1527-21, Phase I Environmental Site Assessment (ESA) of the Happy Creek Road Parcel located at 1321 Happy Creek Road in Front Royal, Warren County, Virginia (i.e. subject property). This Executive Summary is an integral part of the Phase I ESA report. ECS recommends that the report be read in its entirety.

The subject property is identified by Warren County as Tax Map Number 20A212-4 and is owned by theIndustrial Development Authority Town of Front Royal. The approximately 41.109-acre subject property is developed with a vacant single-family residence and associated storage shed that were reportedly constructed in 1969. The subject property is reportedly heated with electricity and receives water and sanitary sewer services from the town of Front Royal. A gravel driveway is located in the northern portion of the site and affords access to the subject property. The vacant residence contains three bedrooms, a kitchen, two and a half bathrooms, a living room, a dining room, a laundry room, a sun-room, a basement, and storage areas. A three-car garage is also attached to the structure. *De minimis* staining was observed in the garage and appears to have originated from regular vehicle use.

The remainder of the subject property consists of open grassy areas and wooded land. A water utility line transects the subject property from north to south, and an overhead power line transects the northern portion of the subject property. A pole-mounted transformer is located to the southeast of the subject property. The transformer is reportedly owned and maintained by the town of Front Royal. Staining, which could be indicative of leakage, was not observed on the transformer or surfaces in the vicinity of the transformer.

The subject property is located in a residential area of Front Royal, Virginia. Based on our review of site topography and conditions observed during the site reconnaissance, it is our professional opinion that properties to the south are presumed to be hydrogeologically up-gradient of the subject property. The adjoining properties to the north of the subject property consist of cleared agricultural land. The adjoining properties to the east, south, and west consist of single-family residences. ECS did not identify current activities, uses, or conditions at adjoining or nearby properties that are believed to present a recognized environmental condition (REC) at the subject property.

The adjoining properties to the north of the subject property consist of cleared agricultural land. The adjoining properties to the east, south, and west consist of single-family residences. ECS did not identify current activities, uses, or conditions at adjoining or nearby properties that are believed to present a recognized environmental condition (REC) at the subject property.

According to historical research, the subject property was undeveloped from 1939 until 1969, when a single-family home was constructed on the subject property. The surrounding area has developed slowly from a primarily rural area into a residential area over time. Residences were located to the east and west by the late 1930s. Additional residences were constructed to the east and west throughout the 1960s. Residential subdivisions were constructed to the west, south, and east from the mid-2000s through the mid-2010s. Warren County Middle School was constructed further east in 2016. No obvious indications of RECs were identified in the historical data review.

ECS previously conducted a Phase I ESA for this subject property in October 2023 (ECS Project Number 47:15516). The report indicated that the subject property was developed with a vacant single-family residence. ECS did not identify RECs for the subject property at the time the Phase I ESA was completed.

A regulatory database search report was provided by Environmental Risk Information Services (ERIS). The database search involves researching a series of Federal, State, Local, and other databases for facilities and properties that are located within specified minimum search distances from the subject property. The report did not identify the subject property on the databases researched. The ERIS report identified several off-site properties within the minimum ASTM search distances. Based on our review of reasonably ascertainable public records, issues associated with the listings in the database report are not believed to represent a REC for the subject property.

ASTM E1527-21 defines a "*data gap*" as: "a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information." A *"significant data gap"* is "a data gap that affects the ability of the environmental professional to identify a recognized environmental condition." Significant data gaps that would be expected to impact our ability to render a professional opinion concerning the subject property were not identified.

We have performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM E1527-21 of the Happy Creek Road Parcel located at 1321 Happy Creek Road in Front Royal, Warren County, Virginia, the subject property. Any exceptions to, or deletions from, this practice are described in Section 2.6 of this report. This assessment has revealed no evidence of recognized environmental conditions, controlled recognized environmental conditions, or significant data gaps in connection with the property.

1.1 Recommendations

It is the opinion of ECS Mid-Atlantic, LLC that additional environmental assessment of the subject property is not warranted at this time.

Table of Critical Dates

Item	Date
Report Issuance Date & Declaration by Environmental Professional	October 30, 2023
Date of Interview with Past and Present Owners and Occupants	October 4, 2023
Date of Recorded Environmental Cleanup Lien Search	N/A
Date of Government Record Review Report	October 3, 2023
Date of Visual Inspection of Subject and Adjoining Properties	October 4, 2023
Earliest Date of Interviews, Lien Search, Record Reviews, and Inspections	October 3, 2023
Report Viability Date	March 31, 2023

According to ASTM E1527-21: "...an environmental site assessment meeting or exceeding this practice is presumed to be viable when it is conducted within 180 days prior to the date of acquisition of the subject property (or, for transactions not involving an acquisition such as a lease or refinance, the date of the intended transaction). The dates of the components presented in 4.6.2(i), (iii), (iv), and (v) for interviews, review of government records, visual inspections, and declaration by environmental professional, shall be identified in the report. Completion of searches for recorded environmental cleanup liens (4.6.2(ii)) is a user responsibility; however, if the user has engaged the environmental professional to conduct these searches, then that date shall also be identified in the report." The 180-day viability period begins with the date of the earliest referenced resource noted above.

ECS was neither contracted to obtain information on environmental liens or activity and use limitations (AULs) nor have we been provided with information on environmental liens or AULs for our review. It should be noted by the User of this report that if the User does not obtain AUL information, the User that is seeking to qualify for an innocent landowner, a contiguous property owner, or a bona fide prospective purchaser liability defense may lose these rights to qualify under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

2.0 INTRODUCTION

ECS was contracted by Rappahannock Development Group to perform an ASTM E1527-21, Phase I Environmental Site Assessment (ESA) of the Happy Creek Road Parcel located at 1321 Happy Creek Road in Front Royal, Warren County, Virginia (i.e. subject property). A Site Location Map is provided in Appendix I.

2.1 Purpose and Reason for Performing Phase I ESA

The purpose of the ESA was to:

- identify the presence or likely presence of hazardous substances and/or petroleum in, on, or at the subject property due to a release (defined by 42 United States Code (USC) 9601.22) and/or likely release; or under conditions that pose a material threat of a future release in accordance with ASTM E1527-21. (Note: presence or likely presence of hazardous substances or petroleum in, on, or at the subject property may originate from onsite or offsite sources);
- conduct all appropriate inquiries as defined by ASTM E1527-21 and 40 Code of Federal Regulations (CFR) Part 312; and,
- provide a professional opinion regarding Recognized Environmental Conditions (RECs), Controlled Recognized Environmental Conditions (CRECs), and Historical Recognized Environmental Conditions (HRECs), as defined by ASTM E1527-21, in, on, or at the subject property.

The ESA should allow the Users the opportunity to qualify for landowner liability protection under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provided certain stipulations are met. The landowner liability protections are: an innocent landowner, a contiguous property owner, or a bona fide prospective purchaser. The User must meet the protection stipulations detailed in CERCLA to qualify as well as meet the User Obligations contained within the ASTM E1527-21 standard.

This ESA was requested by Rappahannock Development Group in anticipation of the redevelopment of the subject property. Therefore, ECS understands that the purpose of the ESA is to identify likely sources of releases to assist User with obtaining information as needed for the financial/business decisions of the User.

2.2 Scope of Services

The environmental assessment was conducted in general accordance with ASTM E1527-21, which is in accordance with EPA Standards and Practices for All Appropriate Inquiry (40 CFR §312.10). The environmental assessment was conducted under the supervision or responsible charge of an individual that qualifies as an environmental professional, as defined in 40 CFR §312.10.

ECS was contracted by Rappahannock Development Group to perform an ASTM E1527-21, Phase I Environmental Site Assessment (ESA) of the Happy Creek Road Parcel located at 1321 Happy Creek Road in Front Royal, Warren County, Virginia. ECS was not contracted to conduct additional services beyond the scope of a base ASTM E1527-21 Phase I ESA as part of this assessment.

2.3 Definitions

ASTM E1527-21 defines a "*recognized environmental condition (REC)*" as "(1) the presence of hazardous substances or petroleum products in, on, or at the subject property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment." For the purposes of this definition, "likely" is that which is neither certain nor proved, but can be expected or believed by a reasonable observer based on the logic and/or experience of the environmental professional, and/or available evidence, as stated in the report to support the opinions given therein.

ASTM E1527-21 defines a "*historical recognized environmental condition (HREC)*" as "a previous release of hazardous substances or petroleum products affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the subject property to any controls (for example, activity and use limitations or other property use limitations). A historical recognized environmental condition is not a recognized environmental condition."

ASTM E1527-21 defines a "*controlled recognized environmental condition (CREC)*" as "recognized environmental condition affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities with hazardous substances or petroleum products allowed to remain in place subject to implementation of required controls (for example, activity and use limitations or other property use limitations)."

ASTM E1527-21 defines a "*business environmental risk (BER)*" as "a risk that can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of commercial real estate, not necessarily related to those environmental issues required to be investigated in this practice." This assessment does not include ASTM Non-Scope items or identify business environmental risks unless specifically requested by the Client, and included in Section 8.0 of this report.

ASTM E1527-21 defines a "*de minimis condition" as "a* condition related to a release that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. A condition determined to be a *de minimis* condition is not a recognized environmental condition nor a controlled recognized environmental condition."

2.4 Limitations

The ESA involved a reconnaissance of the subject property and contiguous properties and a review of regulatory and historical information in general accordance with the ASTM standard and EPA regulation referenced herein. Non-scope considerations or additional issues such as asbestos, radon, wetlands, or suspected microbial growth were not assessed unless otherwise described in Section 8.0 of this report.

Note: Although potential vapor migration was considered as part of this ASTM E1527-21 Phase I ESA, the Phase I ESA was not intended to fully meet the requirements of the Vapor Encroachment Screen per the ASTM E2600 guide, which is beyond the scope of an ASTM E1527-21 Phase I ESA.

The conclusions and/or recommendations presented within this report are based upon a level of investigation consistent with the standard of care and skill exercised by members of the same profession currently practicing in the same locality under similar conditions. The intent of this assessment is to identify the potential for recognized environmental conditions in connection with the subject property; however, no environmental site assessment can completely eliminate uncertainty regarding the potential for recognized environmental conditions in connection with the subject property. The findings of this ESA are not intended to serve as an audit for health and safety compliance issues pertaining to improvements or activities at the subject property. ECS is not liable for the discovery or elimination of hazards that may potentially cause damage, accidents or injury.

Observations, conclusions and/or recommendations pertaining to environmental conditions at the subject property are necessarily limited to conditions observed, and or materials reviewed at the time this study was undertaken. It was not the purpose of this study to determine the actual presence, degree or extent of contamination, if any, at this subject property. This could require additional exploratory work, including sampling and laboratory analysis. No warranty, expressed or implied, is made with regard to the conclusions and/or recommendations presented within this report.

This report is provided for the exclusive use of Rappahannock Development Group. This report is not intended to be used or relied upon in connection with other projects or by other unidentified third parties. The use of this report by any undesignated third party or parties will be at such party's sole risk and ECS disclaims liability for any such third party use or reliance. The use of this report is subject to the same terms, conditions and scope of work reflected in this report and the associated proposal.

2.5 Data Gaps

ASTM E1527-21 defines a "*data gap*" as: "a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information." A *"significant data gap"* is "a data gap that affects the ability of the environmental professional to identify a recognized environmental condition."

Use of the subject property was generally documented back to 1939. Historical use of the subject property prior to 1939 could not be discerned based on reasonably ascertainable records reviewed. The ASTM E1527-21 standard requires review of reasonably ascertainable historical resources to develop a history of previous uses of the subject property, adjoining properties, and surrounding area from 1940 or first developed use, at intervals not to exceed five years. Review of reasonably ascertainable historical sources for this assessment has identified gaps in the historical record that exceeded five years during which the use of the subject property could not be discerned, which is considered a data failure per ASTM E1527-21. However, based on the apparent historical undeveloped and residential uses, and information gained from other sources, this data failure would not be expected to alter the findings of this ESA, and is not considered to be a significant data gap.

2.6 Limiting Conditions/Deviations

ASTM E1527-21 requires that the Environmental Professional identify limiting conditions, deletions, and deviations from the ASTM E1527-21 standard, if any, including client-imposed constraints.

The following conditions that limited our ability to observe the subject property and/or identify RECs were encountered while conducting this Phase I ESA:

Dense vegetation covered portions of the subject property and may have obscured environmentally significant features and direct observation of the ground surface. Due to the historically undeveloped wooded land this limiting condition would not be expected to alter the findings of this ESA, and is not considered to be significant.

The scope of this assessment was not intended to deviate from the ASTM E1527-21 Standard Practice unless otherwise noted within this report.

3.0 SUBJECT PROPERTY DESCRIPTION

A general description of the Subject Property is provided in the following Section. A Site Location Map is provided as **Figure 1**, a Topographic Map is provided as **Figure 2**, an Aerial Photograph is provided as **Figure 3**, and a Site Layout/Vicinity Map is provided as **Figure 4** located in Appendix I.

3.1 Subject Property Location and Legal Description

Site Name	Happy Creek Road Parcel
Property Address	1321 Happy Creek Road
Property City, State	Front Royal, Virginia
Property County	Warren County
Number of Parcels	One
Property ID Number	20A212-4
Property Size	Approximately 41.109 acres
Property Owner of Record	Industrial Development Authority Town of Front Royal
Property Legal Description	Residue James W Oden Property Subdivision LR03-10814

3.2 Physical Setting and Hydrogeology

United States Geological Survey (USGS) Topographic Map	
Quad Designation	Front Royal, Virginia
Date	2019
Subject Property Settings	
Geologic Province	Valley and Ridge
Average Subject Property Elevation (in feet or meters)	Approximately 690 feet above mean sea level
General Sloping Direction	The eastern portion of the subject property generally slopes east. The western portion of the subject property generally slopes northwest.
Bodies of Water	None
Presumed Direction of Groundwater Flow	North

Presumed Hydrogeological Up-gradient Direction	South

Nearby Properties' Setting	
General Sloping Direction	Properties to the north and east generally slope northwest; properties to the south generally slope north; and properties to the west generally slope northeast.
Bodies of Water	An intermittent stream is located to the north of the subject property. Leach Run is located approximately 1,900 feet to the southwest of the subject property.
General Directions of Surface Flow	North
Presumed Direction of Groundwater Flow	North

Regional groundwater flow in the immediate vicinity of the subject property is presumed to be generally toward the north. Regional influences such as dewatering, karst conditions, and impermeable soils may have an impact on groundwater flow. The actual groundwater flow direction cannot be determined without site-specific information obtained through the gauging of groundwater monitoring wells.

3.3 Current Use and Description of the Site

The subject property consists of an approximately 41.109-acre parcel of land that is currently utilized as a vacant single-family residence and wooded land. The subject property is improved with a single-family home that was reportedly constructed in 1969. The subject property is located in an area that can generally be described as residential.

4.0 USER PROVIDED INFORMATION

The ASTM standard includes disclosure and obligations of the User to help the Environmental Professional identify the potential for Recognized Environmental Conditions associated with the subject property. The ASTM E1527-21 User Questionnaire was submitted to and completed by Walton Mahon, representing Rappahannock Development Group (User of the report). Section 4.0 is based on the completed User Questionnaire. A copy of the completed User Questionnaire is included in Appendix II.

4.1 Title Information

ECS was provided with title commitment information by the User. The title information indicated that several easements were granted to the Town of Front Royal, Virginia, the Potomac Edison Company of Virginia, and Ramsey, Inc. for the maintenance/installation of water, sewer, and telephone lines and roadways. A Notice of Order and Judgement Affecting Interest in Real Estate was issued for the subject property in September 2001 regarding easements made for the maintenance of railroad corridors used by the Norfolk Southern Railway Company. No RECs were identified during our review of the provided title information.

4.2 Environmental Liens or Activity and Use Limitations

ECS was neither contracted to obtain information on environmental liens or activity and use limitations. ECS was provided a copy of the Commitment for Title Insurance Report by Rappahannock Development Group, dated September 22, 2023. The title information received did not indicate the presence of environmental liens or restrictions due to environmental conditions. A copy of the provided title information is included in Appendix II of this report.

The User stated they were not aware of any AULs associated with the subject property.

4.3 Specialized Knowledge

The User indicated that they did not possess specialized knowledge of the subject property.

4.4 Commonly Known or Reasonably Ascertainable Information

The User indicated that they were not aware of commonly known environmental concerns related to the subject property.

4.5 Valuation Reduction for Environmental Issues

According to the User, the purchase price being paid for the subject property reasonably reflects its fair market value.

4.6 Owner, Property Manager, and Occupant Information

The User indicated that the subject property is owned by Rappahannock HC, LLC, who can be reached at (540) 847-9669.

4.7 Degree of Obviousness

The User stated that they were not aware of obvious indicators that point to the presence or likely presence of contamination at the subject property.

5.0 RECORDS REVIEW

A regulatory records search of ASTM standard and supplemental databases was conducted for the subject property and is included in Appendix III. The regulatory search report in the appendix includes additional details about the regulatory databases that were reviewed. The regulatory records search involves searching a series of databases for facilities that are located within a specified distance from the subject property. The ASTM standard specifies an approximate minimum search distance from the subject property for each database. Pursuant to ASTM, the approximate minimum search distance may be reduced for each standard environmental record except for Federal NPL site list, and Federal RCRA TSD list. According to ASTM, government information obtained from nongovernmental sources may be considered current if the source updates the information at least every 90 days or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public. The following table indicates the standard environmental record sources and the approximate minimum search distances for each record.

Standard Environmental Record Sources	Approximate Minimum Search Distance Per ASTM (miles)	Subject Property	Off-Site Properties
Federal NPL	1.0	No	0
Federal Delisted NPL	0.5	No	0
Federal CERCLIS	0.5	No	0
Federal CERCLIS NFRAP	0.5	No	0
Federal RCRA CORRACTS	1.0	No	0
Federal RCRA non-CORRACTS TSD	0.5	No	0
Federal RCRA Generators	Subject Site and Adjoining Properties	No	0
Federal IC/EC	Subject Site Only	No	N/A
Federal ERNS	Subject Site Only	No	N/A
State and Tribal Hazardous Waste Sites (NPL Equivalent)	1.0	No	0

Standard Environmental Record Sources	Approximate Minimum Search Distance Per ASTM (miles)	Subject Property	Off-Site Properties
State and Tribal Hazardous Waste Sites (CERCLIS Equivalent)	0.5	No	0
State and Tribal Landfill and/or solid waste disposal sites	0.5	No	0
State and Tribal Leaking Tanks	0.5	No	1
State and Tribal Registered UST and AST	Subject Site and Adjoining Properties	No	0
State and Tribal IC/ EC	Subject Site Only	No	N/A
State and Tribal Voluntary Cleanup (VCP)	0.5	No	0
State and Tribal Brownfield Sites	0.5	No	0

Based on our knowledge of the subject property and the surrounding area, ECS attempts to verify and interpret this data. While this attempt at verification is made with due diligence, ECS cannot guarantee the accuracy of the record(s) search beyond that of information provided by the regulatory report(s). ECS makes no warranty regarding the accuracy of the database report information included within the regulatory report(s).

The regulatory database search was performed by Environmental Risk Information Services (ERIS), and their report is dated October 3, 2023. ECS did not modify the minimum ASTM search distances stipulated in the standard. The regulatory databases reviewed by ECS included supplemental databases researched by ERIS.

5.1 Federal ASTM Databases

5.1.1 Federal RCRIS - Generators

RCRIS identifies facilities that generate hazardous wastes as defined by the RCRA. Very small quantity generators (VSQG) (previously identified as conditionally exempt small quantity generators or CESQGs) generate less than 100 kilograms of hazardous waste, or less than 1 kilogram of acutely hazardous waste, per month. Small quantity generators (SQGs) generate between 100 and 1,000 kilograms of hazardous waste per month. Large quantity generators (LQGs) generate more than 1,000 kilograms of hazardous waste or more than 1 kilogram of acutely hazardous waste per month.

The subject property was not listed on the RCRA databases. No off-site properties within the minimum search distance of inquiry (adjoining properties) were reported by ERIS as being on the Federal RCRIS Generators database. One off-site property within 0.25 miles of the subject property was reported as being on the Federal RCRIS Generators database. Upon review, this listing is reported approximately 1,250 feet away from the subject property. Based on the distance from the subject property and/or relative topographic position, ECS does not believe issues at this listing would result in a REC for the subject property. Additional information pertaining to this listing can be viewed in the regulatory report included in Appendix III.

5.2 State ASTM Databases

5.2.1 Leaking Underground Storage Tank (LUST) List

The LUST list is a record of reported leaking underground storage tank incidents. The LUST list may also identify properties that have had soil and/or groundwater contamination associated with documented releases from aboveground storage tanks (ASTs), surface spills, and other sources.

The subject property was not listed on the LUST database. The database report lists one property within the designated search radius for this database. Upon review, this listing is reported approximately 1,970 feet away from the subject property. Based on the distance from the subject property and/or relative topographic position, ECS does not believe releases at this off-site listing would result in a REC for the subject property. Additional information pertaining to this listing can be viewed in the regulatory report included in Appendix III.

5.3 Additional Environmental Record Sources

5.3.1 Additional Non-ASTM Federal Databases

5.3.1.1 Alternative Fueling Stations Database

The Alternative Fueling Stations database is a list of sites reported by the U.S. Department of Energy's Alternative Fuels Data Center. These sites can include facilities that use alternative fuels such as biodiesel, compressed natural gas, ethanol, hydrogen, propane, liquefied natural gas, and renewable diesel.

The subject property was not listed on the Alternative Fueling Stations database. The database report lists one property within the designated search radius for this database. Upon review, this listing is reported approximately 1,250 feet away from the subject property. Based on the distance from the

subject property and/or relative topographic position, ECS does not believe issues at this listing would result in a REC for the subject property. Additional information pertaining to this listing can be viewed in the regulatory report included in Appendix III.

5.3.1.2 Mineral Resources Data System (MRDS) Database

The Mines MRDS database is a list of sites reported on the Mineral Resources Data System, which is monitored by the United States Geological Survey (USGS).

The subject property was not listed on the Mines MRDS database. The database report lists four facilities within the designated search radius for this database. Upon review, these listings are reported more than 3,840 feet away from the subject property. Based on the distance from the subject property and/or relative topographic position, ECS does not believe these off-site listings would have issues that result in a REC for the subject property. Additional information pertaining to these listings can be viewed in the regulatory report included in Appendix III.

5.3.2 Additional Non-ASTM State Databases

5.3.2.1 SPILLS

The SPILLS database is a list of Pollution Response Program (PREP) reports monitored by the Virginia Department of Environmental Quality.

The subject property was not listed on the SPILLS database. The database report lists one facility within the designated search radius for this database. This listing is discussed below:

> **Retention Pond Equipment Washout, Happy Creek Road and Ewell Street.** This facility is located approximately 455 feet to the east, across Ewell Street, and is situated in a presumed cross-gradient hydrogeological position relative to the subject property. This site is listed with one closed SPILLS case. SPILLS Case #99468 was opened at this site in June 2017 and closed the following September regarding reports of a construction company rinsing its equipment into the retention pond. Based on our review of reasonably ascertainable information, including relative distance from the subject property, issues related to this listing are not considered to present a REC for the subject property.

5.3.3 Other Proprietary Databases

Neither the subject property nor properties within the designated search radii were identified on the additional proprietary databases researched for this assessment.

5.3.4 Unmapped (Unplottables) Facilities and Sites

No properties were identified on the Unplottables Summary List.

5.4 Regulatory Review Summary

A regulatory database search report was provided by ERIS. The database search involves researching a series of Federal, State, Local, and other databases for facilities and properties that are located within specified minimum search distances from the subject property. The report did not identify the subject property on the databases researched. The ERIS report identified several off-site properties within the minimum ASTM search distances. Based on our review of reasonably ascertainable public records, ECS does not consider the listings to be potential sources of soil, groundwater, or vapor impact on the subject property. Therefore, ECS does not believe that the off-site listings would have issues that result in RECs for the subject property.

6.0 HISTORICAL USE INFORMATION

6.1 Aerial Photograph Review

ECS reviewed aerial photographs of the subject property and immediately surrounding properties for evidence of former usage which may indicate potential environmental issues. The aerial photographs were obtained from ERIS. The aerial photographs reviewed were dated 1937, 1945, 1950, 1960, 1972, 1977, 1984, 1989, 1997, 2004, 2005, 2006, 2008, 2009, 2011, 2012, 2014, 2016, 2018, 2021, and 2022. Aerial photographs dated prior to 1937 were not available for review. The ECS review is dependent on the quality and scale of the photographs. The following is a description of relevant information from the aerial photographs:

Year(s)	Subject Property	Adjoining Properties	REC? (yes or no)
1937	The northern portion of the subject property appeared to be cleared, vacant land. The southern portion of the subject property appeared to be vacant, wooded land.	An apparent road and railroad bordered the subject property to the north. Apparent residences were located to the west of the subject property. Apparent agricultural land and associated outbuildings were located further southwest.	No
1945-1960		Apparent residences were located to the east of the subject property.	No
1972-1997	The northern portion of the subject property appeared to be developed with a single-family residence.	Additional apparent residences were constructed to the east, southwest, and northwest of the subject property.	No
2004-2006		Apparent single-family residences were constructed to the west of the subject property. Land to the east and south appeared to be under development. An apparent residence was constructed further north.	No
2008-2014		Apparent single-family residences were constructed to the east of the subject property. Land to the southeast appeared to be under development.	No

Year(s)	Subject Property	Adjoining Properties	REC? (yes or no)
2016-2022		Additional apparent single-family residences were constructed to the east and southeast of the subject property. An apparent school was constructed further east.	No

6.2 Sanborn Fire Insurance Map Review

In an effort to identify past uses, ECS utilized ERIS to search for historical Sanborn Fire Insurance Maps (Sanborn) for the subject property and surrounding area. Sanborn maps were not available for this area. The absence of such maps generally indicates that the subject property is located in an area where Sanborn maps were not produced because the area was rural or it was not economically feasible. ECS does not expect the lack of Sanborn maps to impact our ability to render a professional opinion concerning the subject property given the amount of historical information obtained from our research, the USGS topographic map, aerial photographs, city directories, and other historical records obtained. A copy of the Unmapped Property report is included within Appendix IV.

6.3 Historical USGS Topographic Maps

Topographic maps are produced by the USGS for various time periods. ECS reviewed topographic maps of the subject property and immediately surrounding properties for evidence of former usage that may indicate potential environmental issues. The topographic maps were obtained from ERIS and were dated 1939, 1944, 1967, 1978, 1986, 1994, 2016, and 2019. Topographic maps dated prior to 1939 were not available for review. The following is a description of relevant information from the topographic maps:

Year(s)	Subject Property	Adjoining Properties	REC? (yes or no)
1939-1944	No structures were depicted on the subject property. A stream was depicted along the northern property boundary.	A road and railroad were depicted along the northern border of the subject property. Structures were depicted to the east, southwest, and west of the subject property.	No
1967	No structures were depicted on the subject property. The subject property was shaded as primarily wooded land.	Additional structures were depicted to the east and west.	No

Year(s)	Subject Property	Adjoining Properties	REC? (yes or no)
1978-1994	Two structures and a road were depicted in the northern portion of the subject property.	Additional structures were depicted to the east and southwest. An unimproved road/ trail was depicted to the south.	No
2016-2019	The northern portion of the subject property was shaded as cleared/developed land. The remainder of the subject property was shaded as wooded land. Individual structures were not depicted on the 2016 and 2019 topographic maps.	Adjoining properties were shaded primarily as cleared/ developed land. Individual structures were not depicted on the 2016 and 2019 topographic maps.	No

6.4 City Directory Review

One of the ASTM standard historical sources to be reviewed for previous subject property uses is local street directories, commonly known as City Directories. The purpose of the directory review is to identify past occupants of the subject property, adjoining properties, or nearby properties. In some rural areas, street directories information is limited.

ECS reviewed city directories obtained from ERIS. The subject property address utilized for the research was 1321 Happy Creek Road. The directories reviewed were dated 1961, 1964, 1967, 1971, 1976, 1981, 1985, 1986, 1992, 1996, 2000, 2003, 2008, 2012, 2016, 2020, and 2022. The directories reviewed prior to 1985 did not provide listings for the subject property or surrounding area. Directories dated prior to 1961 were not available for review. A copy of the city directory report is included in Appendix IV. The following is a description of relevant information from the city directories:

Year(s)	Listed Occupants	REC? (yes or no)
Subject Property		
1321 Happy Creek Road		
2016-2022	The Oden family	No
1985-1986	Robert C. Sheaffer	No
Adjoining Properties		
1174 Happy Creek Road		
1985-2022	Several residential occupants	No

Year(s)	Listed Occupants	REC? (yes or no)
1405 Happy Creek Road		
2016-2022	Jerry McDonald	No
2000-2012	Jerry McDonald Sawmill	No
1996	Jerry McDonald	No
1205 Happy Creek Road		
2012	The Oden family	No
1201 Happy Creek Road		
1996	The Oden family	No

6.5 Property Tax Files

Property tax files may include records of past ownership, appraisals, maps, sketches, photos, or other information kept by the local jurisdiction for property tax assessment purposes. According to the Warren County tax assessor online information, the subject property is owned by Industrial Development Authority Town of Front Royal. The subject property is listed as a 41.109-acre parcel with Tax Map Number 20A212-4. Additionally, the on-site building is reported as being constructed in 1969.

6.6 Recorded Land Title Records

Recorded land title records may include leases, land contracts, and AULs recorded by the local jurisdiction. Land title records may provide only a list of the names of previous owners and may be of limited use; however, they may provide useful information about uses or occupancy of the property when employed in combination with other sources.

ECS was provided with title commitment information by the User. No RECs were identified during our review of the provided title information. A copy of the provided title information is included in Appendix II of this report.

6.7 Building Department Records

The term building department records means those records of the local government indicating permissions of the local government to construct, alter or demolish improvements on the property.

Building permits were not available for the subject property via ERIS. ECS contacted Warren County to determine if they had historical information regarding the subject property. A Freedom of Information Act (FOIA) request was submitted to Warren County on October 3, 2023. No information has been received at the time of the report completion. If information is received that changes the conclusions or recommendations of this report, ECS will forward the information to the Client.

6.8 Zoning/Land Use Records

The term zoning/land use records refer to records of the local government indicating the uses permitted by the government in particular zones within its jurisdictions.

ECS reviewed zoning/land use records obtained from the Warren County online tax assessor information. The subject property is currently zoned for single-family residential (R-S) use.

6.9 Previous Reports

ECS previously conducted a Phase I ESA for this subject property in October 2023 (ECS Project Number 47:15516). The report indicated that the subject property was developed with a vacant single-family residence. ECS did not identify RECs for the subject property at the time the Phase I ESA was completed.

6.10 Other Historical Sources

Other credible historical sources may be reviewed to identify past uses of the subject property. These sources may include websites, county or state road maps, historical society documents, or local library information.

6.10.1 State Environmental Agency

A FOIA request was sent to the Virginia Department of Environmental Quality (VDEQ) on October 2, 2023, regarding the hazardous material responses, the installation, removal, or closure in place of USTs and ASTs, and the use, storage, generation, spillage and disposal of petroleum products or hazardous materials at the subject property. The VDEQ responded on October 3, 2023, stating that no records were found for the subject property.

6.10.2 County Agency

Warren County was contacted to determine if they had historical information regarding environmental issues or responses at the subject property. A FOIA request was submitted to Warren County on October 3, 2023, 2023. Warren County responded on October 4, 2023, stating that no records were found for the subject property.

6.10.3 Local Fire Department

The Warren County Fire Department was contacted to determine if they had historical information regarding environmental issues or responses at the subject property. A FOIA request was submitted to the Warren County Fire Department on October 4, 2023. No information has been received at the time of the report completion. If information is received that changes the conclusions or recommendations of this report, ECS will forward the information to the Client.

6.11 Historical Use Summary

According to historical research, the subject property was undeveloped from 1939 until 1969, when a single-family home was constructed on the subject property.

The surrounding area has developed slowly from a primarily rural area into a residential area over time. Residences were located to the east and west by the late 1930s. Additional residences were constructed to the east and west throughoutthe 1960s. Residential subdivisions were constructed to the west, south, and east from the mid-2000s through the mid-2010s. Warren County Middle School was constructed further east in 2016. No obvious indications of RECs were identified in the historical data review.

7.0 SITE AND AREA RECONNAISSANCE

7.1 Methodology

Joseph Saldaña of ECS conducted the field reconnaissance on October 4, 2023. ECS was accompanied during the reconnaissance by Joe Petty with the Warren County Economic Development Authority. The weather at the time of the reconnaissance was 80 degrees Fahrenheit and clear. Observations were made from a walking reconnaissance around the perimeter, around the buildings, through the buildings and along several transects across the subject property, where accessible. Access or visibility limitations, if any, are discussed in Section 2.6. Subject property photographs are included in Appendix V.

7.2 On-Site Features

7.2.1 Observed Geologic, Hydrogeologic, Hydrologic, and Topographic Conditions

The subject property consists primarily of wooded land and rolling hills. The eastern portion of the subject property was observed to slope generally to the east and the western portion of the subject property was observed to slope generally to the northwest. Several apparently dry intermittent stream beds were observed to transect the wooded areas of the subject property.

7.2.2 Past Site Uses

During the site reconnaissance, ECS observed the subject property for evidence of past occupancy or usage that could indicate the presence of environmental concerns. Based on current site conditions observed during the site reconnaissance, ECS did not identify evidence of past uses or occupancy that would indicate the presence of a REC for the subject property.

7.2.3 Current Uses

The approximately 41.109-acre subject property is developed with a vacant single-family residence and associated storage shed that were reportedly constructed in 1969. The subject property is reportedly heated with electricity and receives water and sanitary sewer services from the town of Front Royal. A gravel driveway is located in the northern portion of the site and affords access to the subject property. The vacant residence contains three bedrooms, a kitchen, two and a half bathrooms, a living room, a dining room, a laundry room, a sunroom, a basement, and storage areas. A three-car garage is also attached to the structure. *De minimis* staining was observed in the garage and appears to have originated from regular vehicle use.

The remainder of the subject property consists of open grassy areas and wooded land. A water utility line transects the subject property from north to south, and an overhead power line transects the northern portion of the subject property. A pole-mounted transformer is located to the southeast of the subject property. The transformer is reportedly owned and maintained by the town of Front Royal. Staining, which could be indicative of leakage, was not observed on the transformer or surfaces in the vicinity of the transformer.

The table below lists pertinent features of interest that were assessed for the subject property. Relevant information regarding pertinent features is discussed further in this section.

Feature	Yes	No
Hazardous Substances and Petroleum Products in Connection with Identified Uses	✔	
Hazardous Substance and Petroleum Product Containers Not in Connection with Identified Uses		✔
Drums, Totes, and Intermediate Bulk Containers		✔
Unidentified Substance Containers		✔
Underground or Aboveground Storage Tanks		✔
Strong, Pungent or Noxious Odors		✔
Standing Surface Water and Pools or Sumps Containing Liquids Likely to be Hazardous Substances or Petroleum Products		✔
Known or Suspect PCB-containing Equipment	✔	
Stains or Corrosion to Floors, Walls or Ceilings	✔	
Stained Soil or Pavement		✔
Floor Drains and Sump Pumps		✔
Pits, Ponds or Lagoons		✔
Stressed Vegetation		✔
Solid Waste Mounds or Non-natural Fill Materials		✔
Water/Wastewater Discharge		✔
Groundwater Wells		✔
Septic Systems or Cesspools		✔
Hydraulic Equipment (Elevators, Lifts, Compactors, Etc.)		✔
Dry Cleaning		✔
Specialized Industrial Equipment		✔
Onsite Electrical Generators		✔
Oil-water Separators		✔

Hazardous Substances and Petroleum Products in Connection with Identified Uses

Several containers of paint and routine cleaners were observed in the storage shed. A rusted and apparently empty 55-gallon drum was observed in the southeastern portion of the subject property. The observed drums and containers were situated on soil and concrete surfaces. Staining was not observed on the drum and containers or the ground surfaces in their vicinity.

Known or Suspect PCB-containing Equipment

A pole-mounted transformer is located to the southeast of the subject property. The transformer is reportedly owned and maintained by the town of Front Royal. Non-PCB stickers were not observed on the transformer. Staining, which could be indicative of leakage, was not observed on the transformer or surfaces in the vicinity of the transformer.

Note that fluorescent light ballasts, caulk, paint, or other materials that may contain PCBs, and are located inside and are part of the building or structure, are outside the scope of this practice.

Stains or Corrosion to Floors, Walls or Ceilings

Staining was observed on the floors of the three-car garage and is believed to originate from regular vehicular use. The staining is approximately two square feet in area and is considered a *de minimis* condition for the subject property.

7.3 Adjoining and Nearby Properties

Contiguous and nearby properties were observed during a walking and vehicular reconnaissance of the subject property boundary and public places. The subject property is located in a residential area of Front Royal, Warren County, Virginia.

Direction	Description	Relative Gradient	REC
North	A railroad and cleared agricultural land are located to the north of the subject property.	Down-gradient	No
East	Single-family residences are located to the east of the subject property.	Down-gradient	No
South	Single-family residences are located to the south of the subject property.	Up-gradient	No
West	Single-family residences are located to the west of the subject property.	Cross-gradient	No

Pertinent features of environmental concern were not observed on adjoining or nearby properties during the site reconnaissance.

7.4 Site and Area Reconnaissance Summary

According to our site observations and a review of adjoining and nearby properties, the subject property is used as a single-family residence and wooded land. The subject property is located in a residential area of Front Royal, Virginia. Details pertaining to our on-site and off-site observations are referenced previously. We did not identify RECs associated with the subject property or neighboring properties and businesses during the reconnaissance.

8.0 ADDITIONAL SERVICES

ASTM guidelines identify non-scope issues, which are beyond the scope of this practice. Non-scope issues have the potential to be business environmental risks. Some of these non-scope issues include; asbestos-containing building materials, radon, lead-based paint, lead in drinking water, wetlands, and suspected microbial growth.

ECS was not authorized to assess non-scope issues in conjunction with this assessment.

9.0 INTERVIEWS

Joseph Saldaña interviewed Joe Petty during the site reconnaissance on October 4, 2023. He has been associated with the subject property for over two years, and has limited knowledge related to the subject property and associated activities. Mr. Petty indicated that he is not aware of 1) any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, at, or from the subject property; 2) any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on or from the subject property; or 3) any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products.

Copies of interview documentation are included in Appendix II.

ECS interviewed local government officials and agencies via written Freedom of Information Act requests. The information gained from such sources is included in Section 6.10.

10.0 FINDINGS AND CONCLUSIONS

10.1 Findings and Opinions

The subject property is identified by Warren County as Tax Map Number 20A212-4 and is owned by theIndustrial Development Authority Town of Front Royal. The approximately 41.109-acre subject property is developed with a vacant single-family residence and associated storage shed that were reportedly constructed in 1969. The subject property is reportedly heated with electricity and receives water and sanitary sewer services from the town of Front Royal. A gravel driveway is located in the northern portion of the site and affords access to the subject property. The vacant residence contains three bedrooms, a kitchen, two and a half bathrooms, a living room, a dining room, a laundry room, a sun-room, a basement, and storage areas. A three-car garage is also attached to the structure. *De minimis* staining was observed in the garage and appears to have originated from regular vehicle use.

The remainder of the subject property consists of open grassy areas and wooded land. A water utility line transects the subject property from north to south, and an overhead power line transects the northern portion of the subject property. A pole-mounted transformer is located to the southeast of the subject property. The transformer is reportedly owned and maintained by the town of Front Royal. Staining, which could be indicative of leakage, was not observed on the transformer or surfaces in the vicinity of the transformer.

The subject property is located in a residential area of Front Royal, Virginia. Based on our review of site topography and conditions observed during the site reconnaissance, it is our professional opinion that properties to the south are presumed to be hydrogeologically up-gradient of the subject property. The adjoining properties to the north of the subject property consist of cleared agricultural land. The adjoining properties to the east, south, and west consist of single-family residences. ECS did not identify current activities, uses, or conditions at adjoining or nearby properties that are believed to present a recognized environmental condition (REC) at the subject property.

The adjoining properties to the north of the subject property consist of cleared agricultural land. The adjoining properties to the east, south, and west consist of single-family residences. ECS did not identify current activities, uses, or conditions at adjoining or nearby properties that are believed to present a recognized environmental condition (REC) at the subject property.

According to historical research, the subject property was undeveloped from 1939 until 1969, when a single-family home was constructed on the subject property. The surrounding area has developed slowly from a primarily rural area into a residential area over time. Residences were located to the east and west by the late 1930s. Additional residences were constructed to the east and west throughout the 1960s. Residential subdivisions were constructed to the west, south, and east from the mid-2000s through the mid-2010s. Warren County Middle School was constructed further east in 2016. No obvious indications of RECs were identified in the historical data review.

ECS previously conducted a Phase I ESA for this subject property in October 2023 (ECS Project Number 47:15516). The report indicated that the subject property was developed with a vacant single-family residence. ECS did not identify RECs for the subject property at the time the Phase I ESA was completed.

A regulatory database search report was provided by Environmental Risk Information Services (ERIS). The database search involves researching a series of Federal, State, Local, and other databases for facilities and properties that are located within specified minimum search distances from the subject property. The report did not identify the subject property on the databases researched. The ERIS report identified several off-site properties within the minimum ASTM search distances. Based on our review of reasonably ascertainable public records, issues associated with the listings in the database report are not believed to represent a REC for the subject property.

10.2 Significant Data Gaps

ASTM E1527-21 defines a "*data gap*" as: "a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information." A *"significant data gap"* is "a data gap that affects the ability of the environmental professional to identify a recognized environmental condition." Significant data gaps that would be expected to impact our ability to render a professional opinion concerning the subject property were not identified.

10.3 De Minimis Conditions

The following *de minimis* condition was identified by ECS during the completion of this assessment:

- Staining was observed on the floors of the three-car garage and is believed to originate from regular vehicular use. The staining is approximately two square feet in area and is considered a *de minimis* condition for the subject property.

10.4 Conclusions

We have performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM E1527-21 of the Happy Creek Road Parcel located at 1321 Happy Creek Road in Front Royal, Warren County, Virginia, the subject property. Any exceptions to, or deletions from, this practice are described in Section 2.6 of this report. This assessment has revealed no evidence of recognized environmental conditions, controlled recognized environmental conditions, or significant data gaps in connection with the property.

10.5 Recommendations

It is the opinion of ECS Mid-Atlantic, LLC that additional environmental assessment of the subject property is not warranted at this time.

11.0 REFERENCES

ASTM E1527-21. Standard Practice for Environmental Site Assessment, Phase I Environmental Site Assessment Process.

ERIS Database Report. Order Number: 23100200645, Happy Creek Road Parcel: 1321 Happy Creek Road, Front Royal, Virginia 22630. Dated October 3, 2023.

ERIS Directory Search. Order Number: 23100200645, Happy Creek Road Parcel: 1321 Happy Creek Road, Front Royal, Virginia 22630. Dated October 5, 2023.

ERIS Fire Insurance Maps Report. Order Number: 23100200645, Happy Creek Road Parcel: 1321 Happy Creek Road, Front Royal, Virginia 22630. Dated October 3, 2023.

ERIS Historical Aerials Report. Order Number: 23100200645, Happy Creek Road Parcel: 1321 Happy Creek Road, Front Royal, Virginia 22630. Dated October 4, 2023.

ERIS Topographic Map Report. Order Number: 23100200645, Happy Creek Road Parcel: 1321 Happy Creek Road, Front Royal, Virginia 22630. Dated October 3, 2023.

Property Owner Interview with Mr. Joe Petty with Warren County Economic Development Authority, dated October 4, 2023.

Old Republic National Title Insurance Company. "Commitment for Title Insurance". Dated September 22, 2023.

Warren County GIS website, accessed on October 12, 2023.

Appendix I: Figures

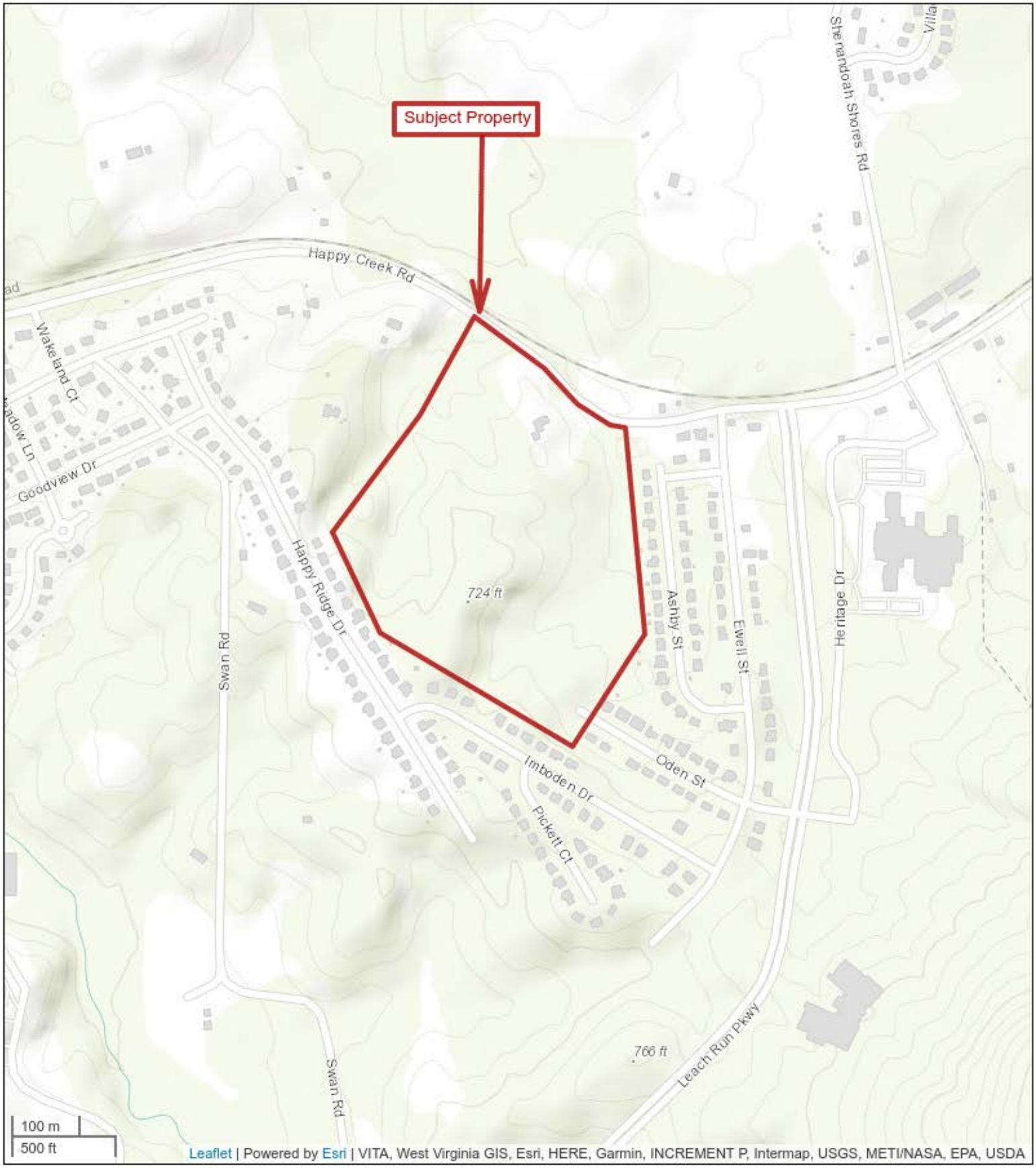

Figure 1

Site Location Map
Happy Creek Road Parcel
1321 Happy Creek Road
Front Royal, Virginia 22630

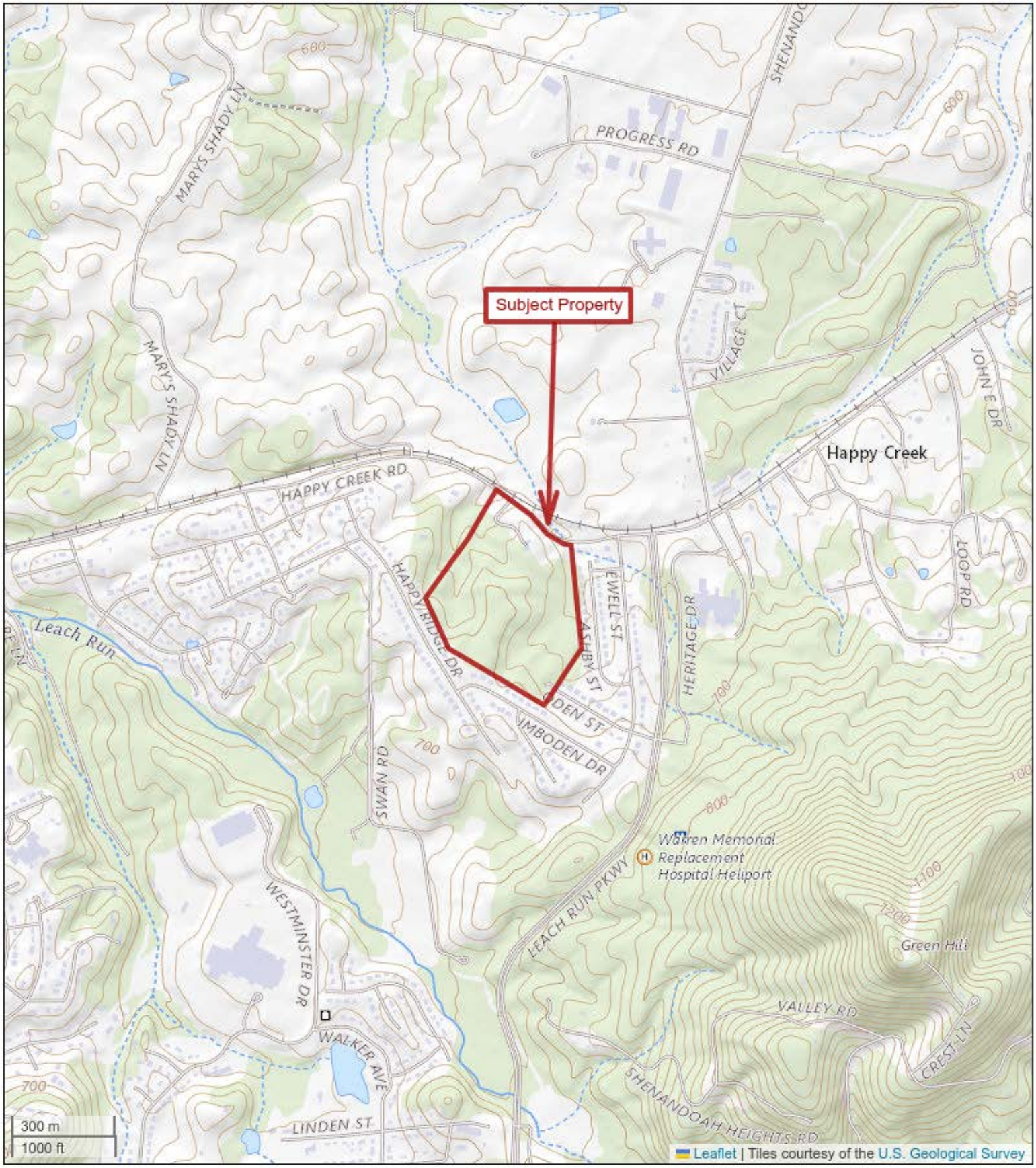

Figure 2

USGS Topographic Map
Happy Creek Road Parcel
1321 Happy Creek Road
Front Royal, Virginia 22630

Figure 3

Aerial Photograph
Happy Creek Road Parcel
1321 Happy Creek Road
Front Royal, Virginia 22630

Figure 4

Site Plan
Happy Creek Road Parcel
1321 Happy Creek Road
Front Royal, Virginia 22630

Appendix II: Interviews, Correspondence and User Questionnaire

Environmental Questionnaire for User

Completion required for conformance with ASTM E 1527-21. Failure to provide this information may preclude CERCLA liability protections for the property purchaser. Please return answered form to ECS.

Site Name: Happy Creek

Name and Title of Person Completing Questionnaire (Please Print):

Walton Mahon, VP

Signature of Person Completing Questionnaire:

Date: 9-28-23

Name of Your Company and Your Contact Number (Please Print):

Rappahannock Development Group (540-847-9669)

ASTM E 1527-21 indicates that, "Either the user shall make known to the environmental professional the reason why the user wants to have the Phase I Environmental Site Assessment performed or, if the user does not identify the purpose of the Phase I Environmental Site Assessment, the environmental professional shall assume the purpose is to qualify for an LLP to CERCLA liability and state this in the report." As the user of this ESA, what is the reason for conducting the Phase I ESA? If this question is unanswered, ECS will assume that the user's reason for the ESA is to qualify for landowner liability protections to CERCLA liability.

Please state reason for having ESA performed: The property will be developed into a residential subdivision. An ESA is required by the homebuilder for the delivery of finished lot

Will you provide Property Title Records and a Legal Description to ECS?

Please select one: **NO** ☐ **YES** ☑

Will you provide a 50-year chain of title abstract to ECS?

Please select one: **NO** ☐ **YES** ☑

Please Send Information Promptly

(1a.) **Environmental liens that are filed or recorded against the site (40 CFR 312.25).** ASTM E 1527-21 states that the user should perform a review of recorded land title records and judicial records for environmental liens or activity and use limitations for the site. Please forward the results of the land title record and judicial record review. If you would prefer, ECS can obtain this information from a third party provider for **an additional fee**. Please let ECS know if you would like to contract ECS for this service.

Please select one: **Client to Provide** ☑ **ECS to Obtain** ☐

(1b.) **Activity and use limitations that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26).** Are you aware of any activity and use limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

(2.) **Specialized knowledge -** As the user of this ESA do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

(3.) **Commonly known or reasonably ascertainable information about the property (40 CFR 312.30).** Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example:

(a.) Do you know the past uses of the property?

Please select one: **NO** ☑ **YES** ☐
If yes, please state uses: _____

(b.) Do you know of specific chemicals that are present or once were present at the property?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

(c.) Do you know of spills or other chemical releases that have taken place at the property?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

(d.) Do you know of any environmental cleanups that have taken place at the property?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

(4.) **Relationship of the purchase price to the fair market value of the property if it were not contaminated (40 CFR 312.29).** Does the purchase price being paid for this property reasonably reflect the fair market value of the property?

Please select one: **NO** ☐ **YES** ☑
If no, please explain: _____

If you are aware that there is a difference, is the lower purchase price because contamination is known or believed to be present at the property?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

(5.) **Parcel Property Owner(s) & Contact Number(s):**

A. [redacted] Rappahannock HC, LLC
B. 540-847-9669
C. _____
D. _____

Property Manager and Occupant(s) & Contact Number(s)

Property Manager: _____
Occupant/Tenant: _____
Occupant/Tenant: _____

(6.) **The degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).** As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

Please select one: **NO** ☑ **YES** ☐
If yes, please explain: _____

Interview Documentation

Contact Name: Joe Pettit	Date: 10/4/23 Time: 1300
Relationship to Property: X Owner ___ Key Site Manager ___ Occupant ___ Other:	Method of contact: ___ Telephone X In Person ___ Email ___ Other:
Years of knowledge related to the Subject Property: 2	
NOTES:	

Interview Part I

Are there any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, at, or from the subject property?	Yes ☐	No ☒
Are there any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on or from the subject property?	Yes ☐	No ☒
Are there any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products?	Yes ☐	No ☒

Interview Part II

ASTM 1527-21 requires that interviewees be asked about the presence of the following specific environmental features:

Feature	Yes	No	Unknown	Details
Hazardous Substances and Petroleum Products in Connection with Identified Uses	X			Paint, household cleaners
Hazardous Substance and Petroleum Product Containers Not in Connection with Identified Uses		X		
Drums, Totes, and Intermediate Bulk Containers		X		
Unidentified Substance Containers		X		
Underground or Aboveground Storage Tanks		X		
Strong, Pungent or Noxious Odors		X		
Standing Surface Water and Pools or Sumps Containing Liquids Likely to be Hazardous Substances or Petroleum Products		X		
Known or Suspect PCB-containing Equipment	X			Pole-mounted transformer
Stains or Corrosion to Floors, Walls or Ceilings	X			Oil stain in garage
Stained Soil or Pavement		X		
Floor Drains and Sump Pumps		X		
Pits, Ponds or Lagoons		X		
Stressed Vegetation		X		
Solid Waste Mounds or Non-natural Fill Materials		X		
Water/Wastewater Discharge		X		
Groundwater Wells		X		
Septic Systems or Cesspools		X		
Elevators		X		
Dry cleaning		X		
Specialized Industrial Equipment		X		
Onsite Emergency Electrical Generators		X		
Oil-water Separators		X		
Hydraulic Lifts		X		

Interview Part III:

Are there any of the following environmentally significant documents available:

Feature	Yes	No	Unknown	Details
Environmental Site Assessment Reports	☐	☐	☒	
Site Investigation Reports	☐	☐	☒	
Environmental Compliance Audit Reports	☐	☐	☒	
Environmental Permits (solid waste disposal, hazardous waste disposal, wastewater, NPDES, underground injections, or air permits)	☐	☐	☒	
Registrations for underground storage tanks or aboveground storage tanks	☐	☐	☒	
Safety Data Sheets	☐	☐	☒	
Community Right-to-know Plans	☐	☐	☒	
Safety Plans	☐	☐	☒	
Geologic or hydrogeologic reports	☐	☐	☒	
Reports related to self-directed or other cleanup activities at the subject property	☐	☐	☒	
Notices or other correspondence from any government agency relating to past or current violations of environmental laws with respect to the subject property	☐	☐	☒	
Environmental liens encumbering the property	☐	☐	☒	
Hazardous waste generator notices or reports (i.e. EPA ID Number, RCRA reporting)	☐	☐	☒	
Geotechnical Studies	☐	☐	☒	

If "yes" to any of the above, request copies of relevant reports.

ALTA COMMITMENT FOR TITLE INSURANCE

Issued by Old Republic National Title Insurance Company

NOTICE

IMPORTANT-READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and the Commitment Conditions, Old Republic National Title Insurance Company, (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I-Requirements have not been met within 6 months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Issued through the Office of:
Old Republic National Title Insurance Company
1800 Bayberry Court
The Meridian Building, Suite 104
Richmond, VA 23226
Phone: 804-281-7490

Authorized Signatory

OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY
A Stock Company
1408 North Westshore Blvd., Suite 900, Tampa, Florida 33607
(612) 371-1111 *www.oldrepublictitle.com*

By C Monroe President

Attest David Wold Secretary

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by Old Republic National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; and Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

COMMITMENT CONDITIONS

1. DEFINITIONS

   a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.

   b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.

   c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

   d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.

   e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

   f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.

   g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

   h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.

   i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.

   j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I-Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

   a. the Notice;

   b. the Commitment to Issue Policy;

   c. the Commitment Conditions;

   d. Schedule A;

   e. Schedule B, Part I-Requirements; and

   f. Schedule B, Part II-Exceptions; and

   g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

   The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

   a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:

      i. comply with the Schedule B, Part I-Requirements;

ii. eliminate, with the Company's written consent, any Schedule B, Part II-Exceptions; or

iii. acquire the Title or create the Mortgage covered by this Commitment.

b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.

c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.

d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.

e. The Company is not liable for the content of the Transaction Identification Data, if any.

f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I-Requirements have been met to the satisfaction of the Company.

g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II-Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.

f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES

This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION

ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

SCHEDULE A

1. Commitment Date: **September 22, 2023 at 8:00 am**

2. Policy to be issued:

   (a) 2021 ALTA Owner's Policy (07-01-21)

   Proposed Insured: **Rappahannock HC, LLC, a Virginia limited liability company**

   Proposed Amount of Insurance: **$1,852,500.00**

   (b) 2021 ALTA Loan Policy (07-01-21)

   Proposed Insured: **TO BE DETERMINED**

   Proposed Amount of Insurance: **TO BE DETERMINED**

3. The estate or interest in the Land described at the Commitment Date is **Fee Simple**.

4. The Title is, at the Commitment Date, vested in:

   Moveon8, LLC, a Virginia limited liability company

5. The land is described as follows:

****TENTATIVE DESCRIPTION****
(The land described as follows is tentative and not in insurable form)

ALL that certain lot or parcel of land lying and being situate in the Town of Front Royal, Happy Creek Magisterial District of Warren County, Virginia, being described as "Remainder TM 20A21-2-4, containing 41.1090 acres, more or less, noted as "area by subtraction, (No survey of TM 20A21-2-4 was made or implied) on that certain plat entitled "Plat Showing Minor Subdivision of the Property of James W. Oden & Betty H. Oden Deed Book 125 at Page 241, Town of Front Royal, Warren County, Virginia, Happy Creek Magisterial District", prepared by Charles E. Walls, L.S., dated April 2, 2003 and recorded in the Clerk's Office of the Circuit Court of Warren County, Virginia in Instrument No. 030010814, Slide 200 L & M. (No survey has been done of subject property, shown as notation only on this referenced plat).

BEING a portion of the same real estate conveyed to Industrial Development Authority of the Town of Front Royal and the County of Warren, Virginia a/k/a Economic Development Authority of the Town of Front Royal and The County of Warren, Virginia by Deed from Moveon8, LLC, a Virginia limited liability company, dated September 14, 2021, recorded October 13, 2021, in the Clerk's Office, Circuit Court, Warren County, Virginia, at Instrument No. 210008884.

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NOTE: The following is provided for information only and should be verified with appropriate taxing authority.

REAL ESTATE TAX INFORMATION:

Tax Assessment for 2023

Tax Map# 20A212 4
Account# 9533
Physical Address: 1321 Happy Creek Rd.
Description: 41.109 acres
Name: Industrial Development Authority of the Town of Front Royal
Land Assessment: $791,000.00
Improvements: $337,400.00
Total Assessment: $1,128,400.00
Total Taxes: $EXEMPT

Town of Front Royal Taxes: EXEMPT

NOTE: Taxes are paid twice yearly on June 5 and December 5.

NOTE: Taxes are DELINQUENT for the year 2021 for Warren County
NOTE: Taxes are DELINQUENT for the years 2019, 2020, and 2021 for Town of Front Royal

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SCHEDULE B - I
COMMITMENT

REQUIREMENTS

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

   (a) Satisfactory Deed of Confirmation from Moveon8, LLC, a Virginia limited liability company, in accordance with the Court's Order in Case No. CL19000398-00, including appropriate recitals and confirming the conveyance to the Industrial Development Authority of the Town of Front Royal and the County of Warren, Virginia a/k/a Economic Development Authority of the Town of Front Royal and The County of Warren, Virginia, a political subdivision of the Commonwealth of Virginia.
   Note: Moveon8, LLC was not an existing entity at the time of the attempted conveyance recorded as Instrument No. 210008884. Its legal status was automatically canceled June 30, 2021 for failure to pay its registration fee. Accordingly, the appropriate parties at the time of the attempted conveyance would have been the Managers at the time of cancellation as Trustees in Liquidation. Moveon 8, LLC should be reinstated with the VA SCC prior to the execution of the required Deed of Confirmation. The applicable window of reinstatement has not expired.

   NOTE: Furnish a copy of the Operating Agreement for Moveon8, LLC, a Virginia limited liability company, for review by the Company prior to closing. Said Deed of Confirmation required above must be executed by all of its Managers.

   (b) Warranty Deed from Industrial Development Authority of the Town of Front Royal and the County of Warren, Virginia a/k/a Economic Development Authority of the Town of Front Royal and The County of Warren, Virginia, a political subdivision of the Commonwealth of Virginia, vesting fee simple title in Rappahannock HC, LLC, a Virginia limited liability company.

   NOTE: The Company must be provided with satisfactory evidence that execution and delivery of the deed required above is in accordance with applicable laws affecting the conveyance of lands owned by the Commonwealth of Virginia.

   NOTE: the Company requires that said Special Warranty Deed conveys the satisfactory acceptable description as required herein (Requirement No. 5 below). Alternatively, the Seller can convey the record legal description with special warranty and quitclaim as to the foregoing.

   (c) Deed of Trust from Rappahannock HC, LLC, a Virginia limited liability company securing your loan.

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Note: Certification or other satisfactory evidence that the limited liability company has been properly formed and is in good standing and that the above required instruments have been properly executed pursuant to and in accordance with its Articles of Organization and written Operating Agreement.

Note: All members of the limited liability company, or the managing member(s) designated in the Operating Agreement, must join in the execution of any instrument(s) required herein. In lieu thereof, such instrument(s) must be executed by the member(s) designated and authorized to act on behalf of the limited liability company as set forth in a satisfactory resolution signed by all members; the resolution shall be provided to the Company prior to closing.

5. Provide the Company with an insurable legal description of the property as the Land described in Schedule A herein is not in insurable form. Upon receipt of satisfactory acceptable description, this commitment shall be amended or otherwise modified.

6. Provide the Company with a satisfactory executed Owner's Affidavit. In the event the Company is not furnished such Owner's Affidavit, the following will appear as exceptions in Schedule B of the Policy(ies):
(i) Rights of parties in possession.
(ii) Any lien, or right to a lien, for services, labor, or material heretofore or hereafter furnished, imposed by law and not shown by the public records.

7. Payment and release of record of the land described in Schedule A hereof from the lien of the following Deed(s) of Trust:

Deed of Trust from Industrial Development Authority of the Town of Front Royal and The County of Warren, Virginia, a political subdivision of the Commonwealth of Virginia to Michael L. Bryan and John P. Bowers, Trustees for The First Bank and Trust Company, dated March 2, 2022, recorded March 2, 2022, as Instrument No. 220001404, to secure $12,350,000.00. Corrected by Correction to Credit Line Deed of Trust, dated May 3, 2022, recorded May 10, 2022, as Instrument No. 220003036.

8. Payment of real estate taxes for the year 2021 for Warren County, including an Administrative fee in the amount of $30, plus penalties and interest which have accrued.

9. Payment of real estate taxes for the years 2019, 2020, and 2021 for Town of Front Royal, plus penalties and interest which have accrued.

10. Should the Company be requested to issue an ALTA 3.1 zoning endorsement, the Company must be provided with the following items:

(a) A satisfactory Zoning Certificate or Letter addressed to the Company from the appropriate department of the jurisdiction where the property is located. The Certificate or letter should address:
1. The current zoning classification of the property, with a copy of the applicable section of the Zoning Ordinance listing the permitted uses, and special conditions, if any.
2. Whether the property is in compliance with its zoning classification.
3. The current use of the property and whether that is a permitted use.
4. Advise if any re-zoning petition for the parcel is currently pending.

(b) Satisfactory zoning report, survey or surveyor's certification which specifically addresses the coverage provided in paragraph 2 (b) of the endorsement, i.e., height of buildings, square footage of

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buildings, building set back lines, and number of parking spaces.

11. Should the Company be requested to issue any of the ALTA 9-06 series endorsements, ALTA 28-06 series endorsement or any other survey related endorsement, the Company must be furnished a current survey prepared in accordance with the Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys and satisfactory evidence of compliance with all terms and provisions including the payment of any assessments required under instruments set forth under Schedule B, Section II.

12. Furnish copies of all instruments to this transaction for review by the Company prior to closing. This Commitment is subject to such additional requirements and/or exceptions as may be deemed necessary by the Company upon review of said documents and upon full disclosure of the structure and all facts of this transaction.

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SCHEDULE B, PART II - EXCEPTIONS

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and conditions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I-Requirements are met.

1. **Taxes, special assessments and/or fees, for the portion of the year 2023 in which the property is not exempt and subsequent years, not yet due and payable.**

2. **Any encumbrance, violation, variation, adverse circumstance, boundary line overlap, or encroachment (including an encroachment of an improvement across the boundary lines of the Land), but only if the encumbrance, violation, variation, adverse circumstance, boundary line overlap, or encroachment would be disclosed by an accurate and complete land title survey of the Land.**

3. **Rights of tenants under unrecorded leases.**
   Note: This exception will be deleted upon receipt of satisfactory Owner's Affidavit stating that there are no tenants.

4. **Easements, terms, duties, conditions, and provisions as contained in Notice of Order and Judgment Affecting Interest in Real Estate, dated September 5, 2001, recorded August 18, 2005, as Instrument No. 050010169.**

5. **Easements as granted to Ramsey, Inc., by Deed of Easement dated June 2, 2006, recorded June 5, 2006, as Instrument No. 060005977, including terms and conditions contained therein.**

6. **Easement to The Potomac Edison Company of Virginia, dated May 24, 1974, recorded November 24, 1974, in Deed Book 219, page 288.**

7. **Easement to The Potomac Edison Company of Virginia, dated July 13, 1971, recorded July 13, 1971, in Deed Book 183, page 501.**

8. **Easement to the Town of Front Royal, Virginia, dated March 12, 1974, recorded May 8, 1974, in Deed Book 210, page 571.**

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From:	Warren County Freedom of Information Act (FOIA) Requests
To:	Joseph Walter Saldana
Cc:	Allie Popp
Subject:	[EXTERNAL] RE: FOIA Request
Date:	Wednesday, October 4, 2023 8:53:38 AM

Please be advised that your FOIA request made on October 3, 2023, has been reviewed. The documentation you have requested does not exist. If you would like to submit another FOIA request, please let us know.

Thank you,
Caitlyn J. Shelton
FOIA Officer
Office of County Adminstration
220 N. Commerce Avenue, Suite 100
Front Royal, Virginia 22630
Phone: (540) 636-6674

THIS MESSAGE IS INTENDED SOLELY FOR THE INDIVIDUAL(S) NAMED IN THE HEADER. THIS MESSAGE MAY CONTAIN MATERIAL THAT IS PRIVILEGED OR CONFIDENTIAL. IF YOU ARE NOT ONE OF THE INTENDED RECIPIENTS, PLEASE DO NOT READ, COPY, USE OR DISCLOSE THIS MESSAGE TO OTHERS; PLEASE NOTIFY THE SENDER BY REPLYING TO THIS MESSAGE; AND THEN PLEASE DELETE THIS MESSAGE FROM YOUR SYSTEM. THANK YOU.

From: Joseph Walter Saldana <JSaldana@ecslimited.com>
Sent: Tuesday, October 3, 2023 1:09 PM
To: Warren County Freedom of Information Act (FOIA) Requests <foia@warrencountyva.gov>
Cc: Allie Popp <APopp@ecslimited.com>
Subject: FOIA Request

Hello,

Per the Freedom of Information Act, ECS Mid-Atlantic, LLC (ECS) requests copies of any file information your office may maintain regarding the hazardous material responses, the installation, removal, or closure in place of underground or aboveground petroleum storage tanks (USTs/ ASTs), or the use, storage, generation, spillage or disposal of petroleum products or hazardous materials at the referenced property in Front Royal, Virginia:

1321 Happy Creek Road

Thank you,

JOSEPH WALTER SALDANA | Environmental Scientist
ECS MID-ATLANTIC, LLC
T 703.471.8400 **D** 703.318.5401 **C** 571.208.4090

14026 Thunderbolt Place, Suite 100, Chantilly, VA 20151-3232
JSaldana@ecslimited.com | www.ecslimited.com

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Confidential/proprietary message/attachments. Delete message/attachments if not intended recipient.

From: West, Pamela (DEQ)
To: Allie Popp
Subject: [EXTERNAL] FOIA Request - 1321 Happy Creek Road, Front Royal
Date: Tuesday, October 3, 2023 9:52:55 AM
Attachments: image001.png

Good morning,

DEQ was not able to locate any records responsive to your request.

Thank you,

Pam West
General Administration Coordinator
Virginia Department of Environmental Quality
4411 Early Road
Harrisonburg, VA 22801
804-698-4512

Appendix III: Regulatory Records Documentation

DATABASE REPORT

Project Property:	*Happy Creek Road Parcel* *1321 Happy Creek Road* *Front Royal VA 22630*
Project No:	*47:15516-A*
Report Type:	*Database Report*
Order No:	*23100200645*
Requested by:	*ECS Limited*
Date Completed:	*October 3, 2023*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

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Notice: IMPORTANT LIMITATIONS and YOUR LIABILITY

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Executive Summary

Property Information:

Project Property:	*Happy Creek Road Parcel* *1321 Happy Creek Road Front Royal VA 22630*
Project No:	*47:15516-A*

Coordinates:

Latitude:	*38.92598559*
Longitude:	*-78.158987*
UTM Northing:	*4,312,401.45*
UTM Easting:	*746,285.85*
UTM Zone:	*UTM Zone 17S*

Elevation:	*687 FT*

Order Information:

Order No:	*23100200645*
Date Requested:	*October 2, 2023*
Requested by:	*ECS Limited*
Report Type:	*Database Report*

Historicals/Products:

Aerial Photographs	*Historical Aerials (with Project Boundaries)*
City Directory Search	*CD - 2 Street Search*
ERIS Xplorer	*ERIS Xplorer*
Excel Add-On	*Excel Add-On*
Fire Insurance Maps	*US Fire Insurance Maps*
Physical Setting Report (PSR)	*Physical Setting Report (PSR)*
Product Summary	*Product Summary for Aerials, FIMs & Topos*
Topographic Map	*Topographic Maps*
Vapor Screening Tool	*Vapor Screening Tool*

Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
Standard Environmental Records								
Federal								
NPL	Y	1	0	0	0	0	0	0
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	0.5	0	0	0	0	-	0
SEMS	Y	0.5	0	0	0	0	-	0
ODI	Y	0.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	0.5	0	0	0	0	-	0
CERCLIS	Y	0.5	0	0	0	0	-	0
IODI	Y	0.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	0.5	0	0	0	0	-	0
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	0.5	0	0	0	0	-	0
RCRA LQG	Y	0.25	0	0	0	-	-	0
RCRA SQG	Y	0.25	0	0	**1**	-	-	**1**
RCRA VSQG	Y	0.25	0	0	0	-	-	0
RCRA NON GEN	Y	0.25	0	0	0	-	-	0
RCRA CONTROLS	Y	0.5	0	0	0	0	-	0
FED ENG	Y	0.5	0	0	0	0	-	0
FED INST	Y	0.5	0	0	0	0	-	0
LUCIS	Y	0.5	0	0	0	0	-	0
NPL IC	Y	0.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	0.5	0	0	0	0	-	0
FEMA UST	Y	0.25	0	0	0	-	-	0
FRP	Y	0.25	0	0	0	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
DELISTED FRP	Y	0.25	0	0	0	-	-	0
HIST GAS STATIONS	Y	0.25	0	0	0	-	-	0
REFN	Y	0.25	0	0	0	-	-	0
BULK TERMINAL	Y	0.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0
SUPERFUND ROD	Y	1	0	0	0	0	0	0
DOE FUSRAP	Y	1	0	0	0	0	0	0
State								
SWF/LF	Y	0.5	0	0	0	0	-	0
LST	Y	0.5	0	0	0	**1**	-	**1**
DELISTED LST	Y	0.5	0	0	0	0	-	0
UST	Y	0.25	0	0	0	-	-	0
AST	Y	0.25	0	0	0	-	-	0
TANK	Y	0.25	0	0	0	-	-	0
DELISTED TANK	Y	0.25	0	0	0	-	-	0
INST	Y	0.5	0	0	0	0	-	0
VRP	Y	0.5	0	0	0	0	-	0
BROWNFIELDS	Y	0.5	0	0	0	0	-	0
Tribal								
INDIAN LUST	Y	0.5	0	0	0	0	-	0
INDIAN UST	Y	0.25	0	0	0	-	-	0
DELISTED INDIAN LST	Y	0.5	0	0	0	0	-	0
DELISTED INDIAN UST	Y	0.25	0	0	0	-	-	0
County	***No County standard environmental record sources available for this State.***							

Additional Environmental Records

Federal

FINDS/FRS	Y	PO	0	-	-	-	-	0
TRIS	Y	PO	0	-	-	-	-	0
PFAS NPL	Y	0.5	0	0	0	0	-	0
PFAS FED SITES	Y	0.5	0	0	0	0	-	0
PFAS SSEHRI	Y	0.5	0	0	0	0	-	0
ERNS PFAS	Y	0.5	0	0	0	0	-	0
PFAS NPDES	Y	0.5	0	0	0	0	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
PFAS TRI	Y	0.5	0	0	0	0	-	0
PFAS WATER	Y	0.5	0	0	0	0	-	0
PFAS TSCA	Y	0.5	0	0	0	0	-	0
PFAS E-MANIFEST	Y	0.5	0	0	0	0	-	0
PFAS IND	Y	0.5	0	0	0	0	-	0
HMIRS	Y	0.125	0	0	-	-	-	0
NCDL	Y	0.125	0	0	-	-	-	0
TSCA	Y	0.125	0	0	-	-	-	0
HIST TSCA	Y	0.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	0.5	0	0	0	0	-	0
ICIS	Y	PO	0	-	-	-	-	0
FED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED FED DRY	Y	0.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
FUDS MRS	Y	1	0	0	0	0	0	0
FORMER NIKE	Y	1	0	0	0	0	0	0
PIPELINE INCIDENT	Y	PO	0	-	-	-	-	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	0.25	0	0	0	-	-	0
SMCRA	Y	1	0	0	0	0	0	0
MRDS	Y	1	0	0	0	0	**4**	**4**
LM SITES	Y	1	0	0	0	0	0	0
ALT FUELS	Y	0.25	0	0	**1**	-	-	**1**
CONSENT DECREES	Y	0.25	0	0	0	-	-	0
AFS	Y	PO	0	-	-	-	-	0
SSTS	Y	0.25	0	0	0	-	-	0
PCBT	Y	0.5	0	0	0	0	-	0
PCB	Y	0.5	0	0	0	0	-	0
State								
SPILLS	Y	0.125	0	**1**	-	-	-	**1**
PC SPILLS	Y	0.125	0	0	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
DRYCLEANERS	Y	0.25	0	0	0	-	-	0
Tribal	***No Tribal additional environmental record sources available for this State.***							
County	***No County additional environmental record sources available for this State.***							
	Total:		0	**1**	**2**	**1**	**4**	**8**

**** PO – Property Only***
**** 'Property and adjoining properties' database search radii are set at 0.25 miles.***

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
1	SPILLS	Retention Pond Equipment Washout	Happy Creek Road x Ewell Street , Front Royal Front Royal VA ***Incident ID | Status | Closure Date:*** 99468 | Closed | 9/12/2017	ENE	0.09 / 455.04	-45	17
2	RCRA SQG	WARREN MEMORIAL HOSPITAL	351 VALLEY HEALTH WAY FRONT ROYAL VA 22630 ***EPA Handler ID:*** VAR000536961	SE	0.24 / 1,251.99	25	18
2	ALT FUELS	New Warren Memorial	351 Valley Health Way Front Royal VA 22630 ***ID:*** 199227	SE	0.24 / 1,251.99	25	21
3	LST	Heinrich Kahrs Residence	1656 Happy Creek Rd Front Royal VA 22630 ***CEDS Fac ID | Case Status:*** 200000220221 | Closed ***RST Status Ind:*** Closed	ENE	0.37 / 1,967.09	-46	21
4	MRDS	HAPPY CREEK MINES	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID:*** 10080697	SSE	0.73 / 3,847.51	87	22
5	MRDS	SEIBEL IRON MINES, INC. MINE	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID:*** 10179410	SSE	0.74 / 3,912.02	84	23
6	MRDS	SEIBEL IRON MINES, INC. MINE	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID:*** 10203803	SSE	0.81 / 4,257.56	55	23
7	MRDS	SEIBLE MINE	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID:*** 10080696	E	0.87 / 4,573.89	24	24

Executive Summary: Summary by Data Source

Standard

Federal

RCRA SQG - RCRA Small Quantity Generators List

A search of the RCRA SQG database, dated Jul 10, 2023 has found that there are 1 RCRA SQG site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
WARREN MEMORIAL HOSPITAL	351 VALLEY HEALTH WAY FRONT ROYAL VA 22630 ***EPA Handler ID**: VAR000536961*	SE	0.24 / 1,251.99	2

State

LST - Leaking Petroleum Storage Tanks

A search of the LST database, dated Jul 19, 2023 has found that there are 1 LST site(s) within approximately 0.50 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
Heinrich Kahrs Residence	1656 Happy Creek Rd Front Royal VA 22630 ***CEDS Fac ID | Case Status**: 200000220221 | Closed* ***RST Status Ind**: Closed*	ENE	0.37 / 1,967.09	3

Non Standard

Federal

MRDS - Mineral Resource Data System

A search of the MRDS database, dated Mar 15, 2016 has found that there are 4 MRDS site(s) within approximately 1.00 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HAPPY CREEK MINES	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID**: 10080697*	SSE	0.73 / 3,847.51	4
SEIBEL IRON MINES, INC. MINE	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID**: 10179410*	SSE	0.74 / 3,912.02	5
SEIBEL IRON MINES, INC. MINE	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID**: 10203803*	SSE	0.81 / 4,257.56	6

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
SEIBLE MINE	WARREN COUNTY FRONT ROYAL VA 22630 ***Dep ID**: 10080696*	E	0.87 / 4,573.89	7

ALT FUELS - Alternative Fueling Stations

A search of the ALT FUELS database, dated Aug 30, 2023 has found that there are 1 ALT FUELS site(s) within approximately 0.25 miles of the project property.

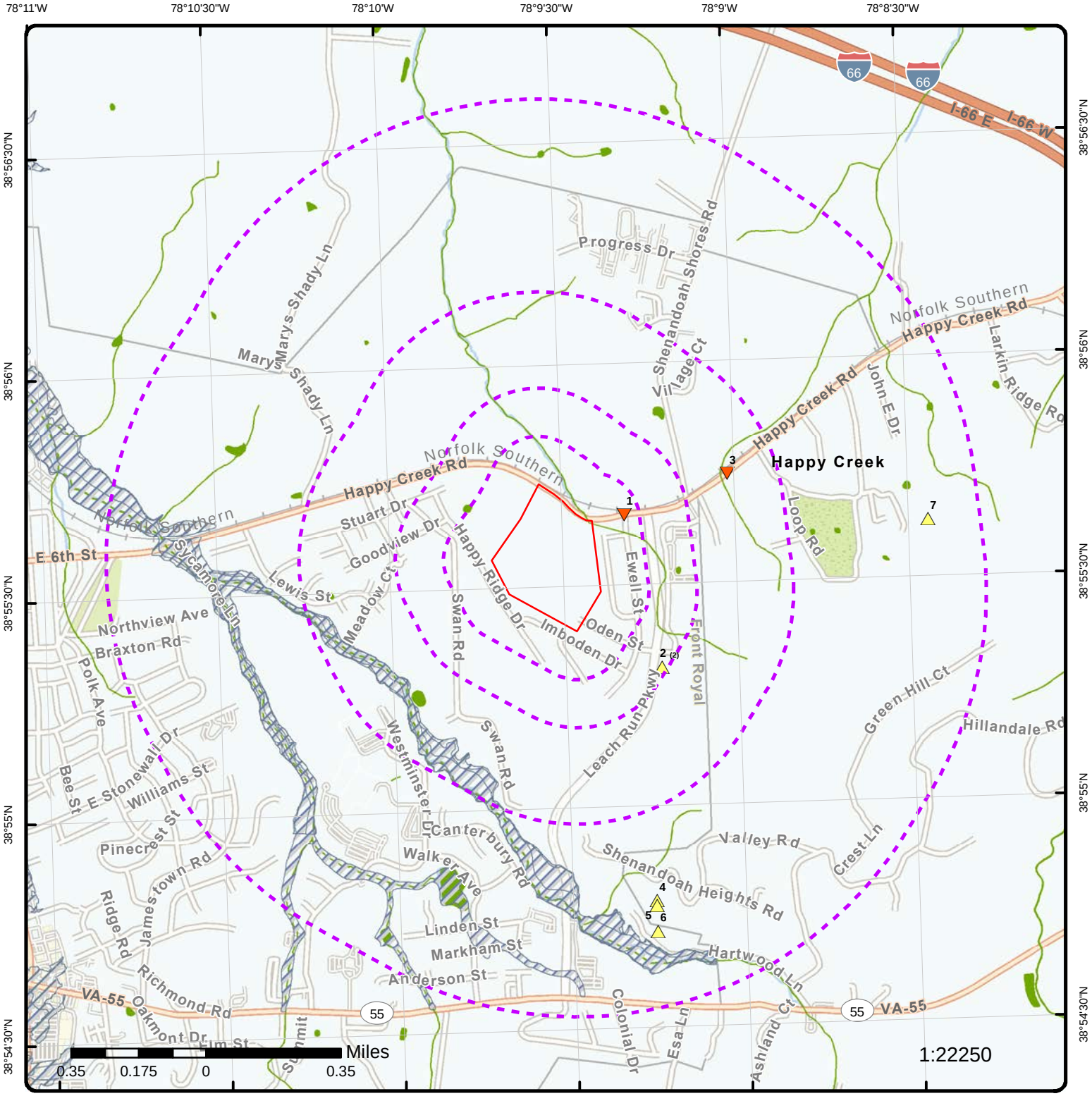
Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
New Warren Memorial	351 Valley Health Way Front Royal VA 22630 ***ID**: 199227*	SE	0.24 / 1,251.99	2

State

SPILLS - Spills

A search of the SPILLS database, dated Jul 17, 2023 has found that there are 1 SPILLS site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
Retention Pond Equipment Washout	Happy Creek Road x Ewell Street , Front Royal Front Royal VA ***Incident ID | Status | Closure Date**: 99468 | Closed | 9/12/2017*	ENE	0.09 / 455.04	1



Map: 1.0 Mile Radius

Order Number: 23100200645

Address: 1321 Happy Creek Road, Front Royal, VA

Project Property

Buffer Outline

Sites with Higher Elevation

Sites with Same Elevation

Sites with Lower Elevation

Sites with Unknown Elevation

Areas with Higher Elevation

Areas with Same Elevation

Areas with Lower Elevation

Areas with Unknown Elevation

Freeways; Highways

Traffic Circle; Ramp

Major & Minor Arterial

Traffic Circle; Ramp

Local Road

Rail

State

Country

National Wetland

Indian Reserve Land

Plume

100 Year Flood Zone

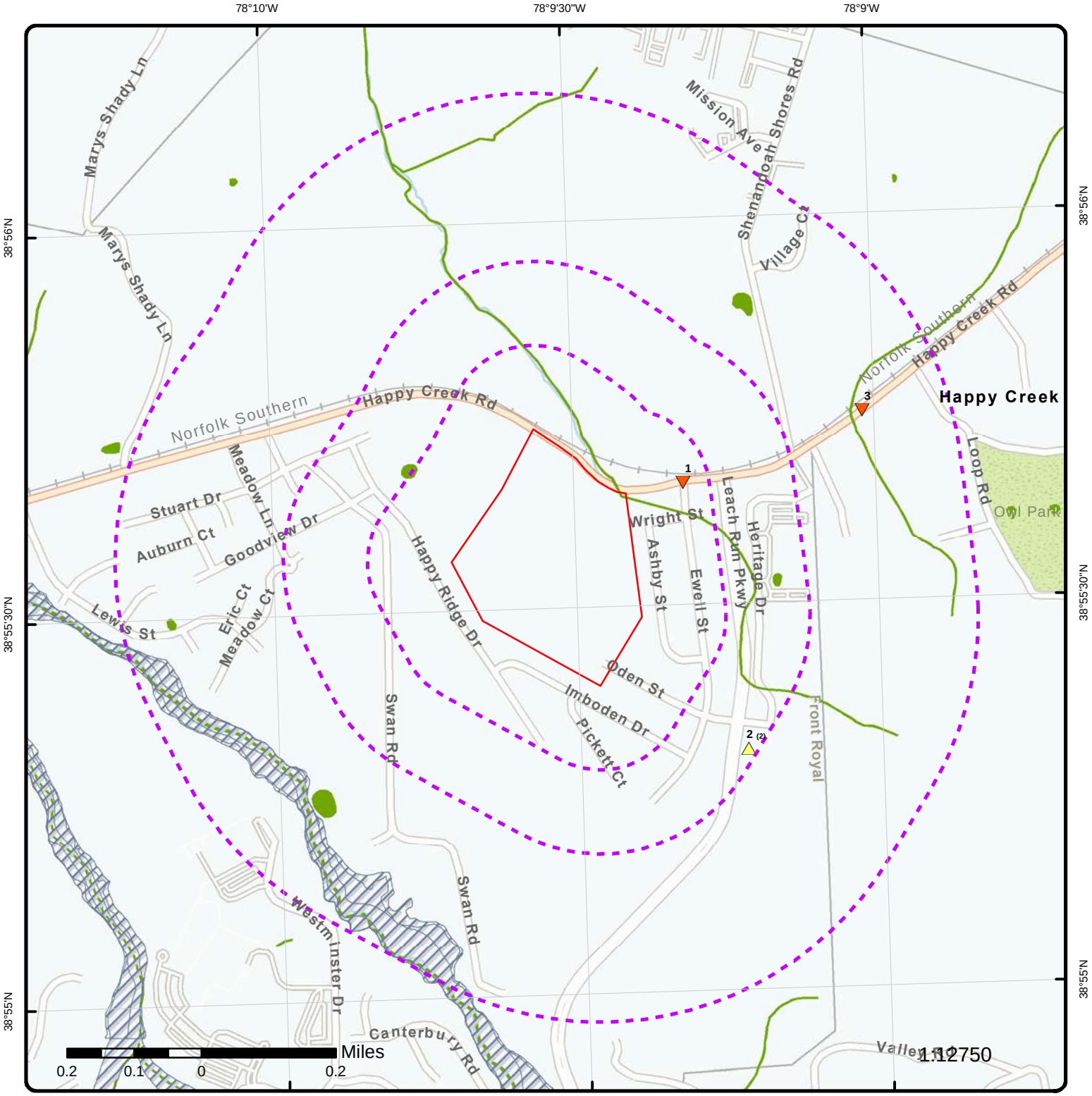
500 Year Flood Zone

FWS Special Designation Areas

National Priorities List (Active, Delisted, Proposed, Institutional Control)

Source: © 2021 ESRI StreetMap Premium

© ERIS Information Inc.



Map: 0.5 Mile Radius

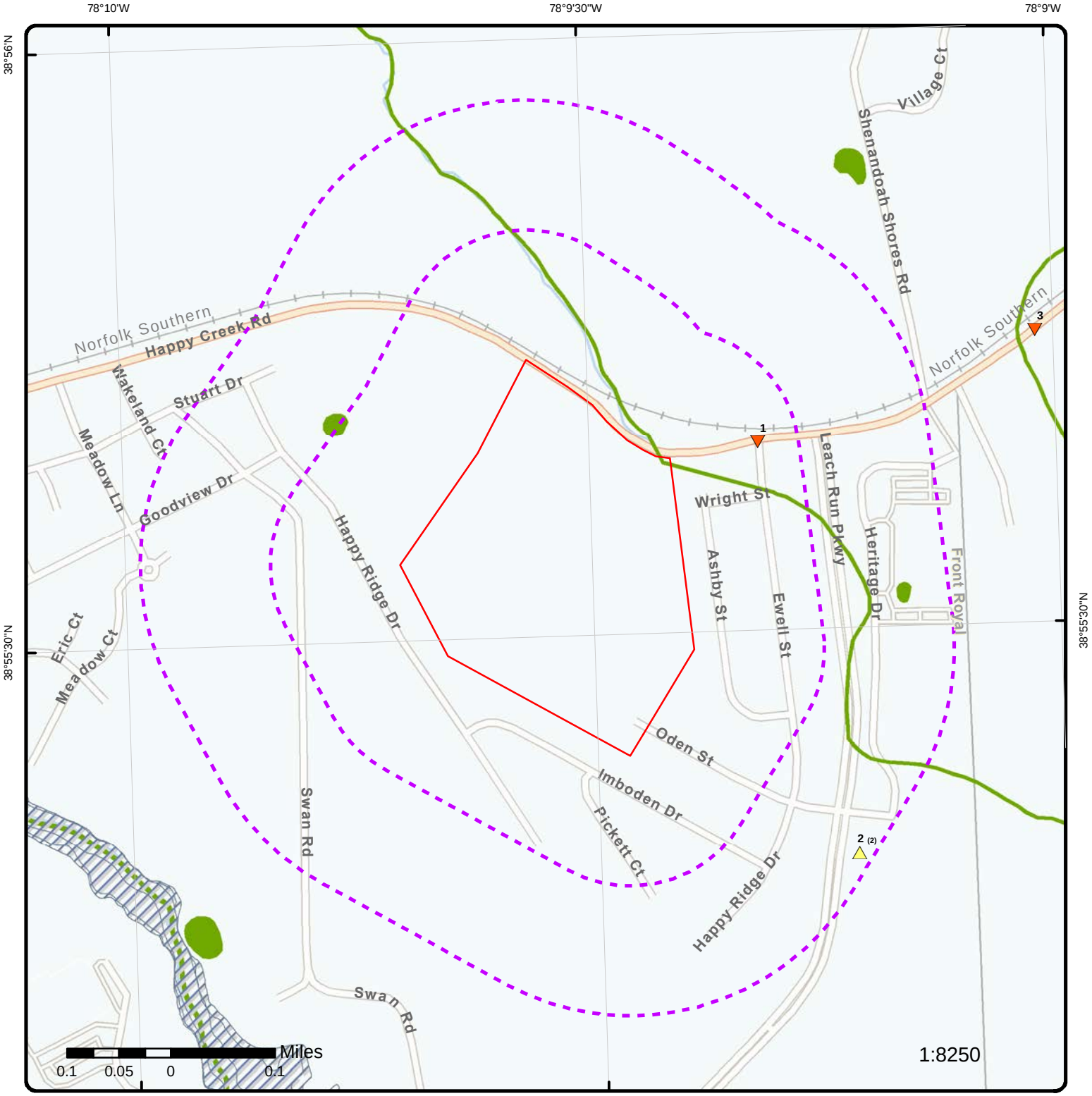
Order Number: 23100200645

Address: 1321 Happy Creek Road, Front Royal, VA

- Project Property
- Buffer Outline
- Sites with Higher Elevation
- Sites with Same Elevation
- Sites with Lower Elevation
- Sites with Unknown Elevation
- Areas with Higher Elevation
- Areas with Same Elevation
- Areas with Lower Elevation
- Areas with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major & Minor Arterial
- Traffic Circle; Ramp
- Local Road
- Rail
- State
- Country
- National Wetland
- Indian Reserve Land
- Plume
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- National Priorities List (Active, Delisted, Proposed, Institutional Control)

Source: © 2021 ESRI StreetMap Premium

© ERIS Information Inc.



Map: 0.25 Mile Radius

Order Number: 23100200645

Address: 1321 Happy Creek Road, Front Royal, VA

- Project Property
- Buffer Outline
- Sites with Higher Elevation
- Sites with Same Elevation
- Sites with Lower Elevation
- Sites with Unknown Elevation
- Areas with Higher Elevation
- Areas with Same Elevation
- Areas with Lower Elevation
- Areas with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major & Minor Arterial
- Traffic Circle; Ramp
- Local Road
- Rail
- State
- Country
- National Wetland
- Indian Reserve Land
- Plume
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- National Priorities List (Active, Delisted, Proposed, Institutional Control)

Source: © 2021 ESRI StreetMap Premium

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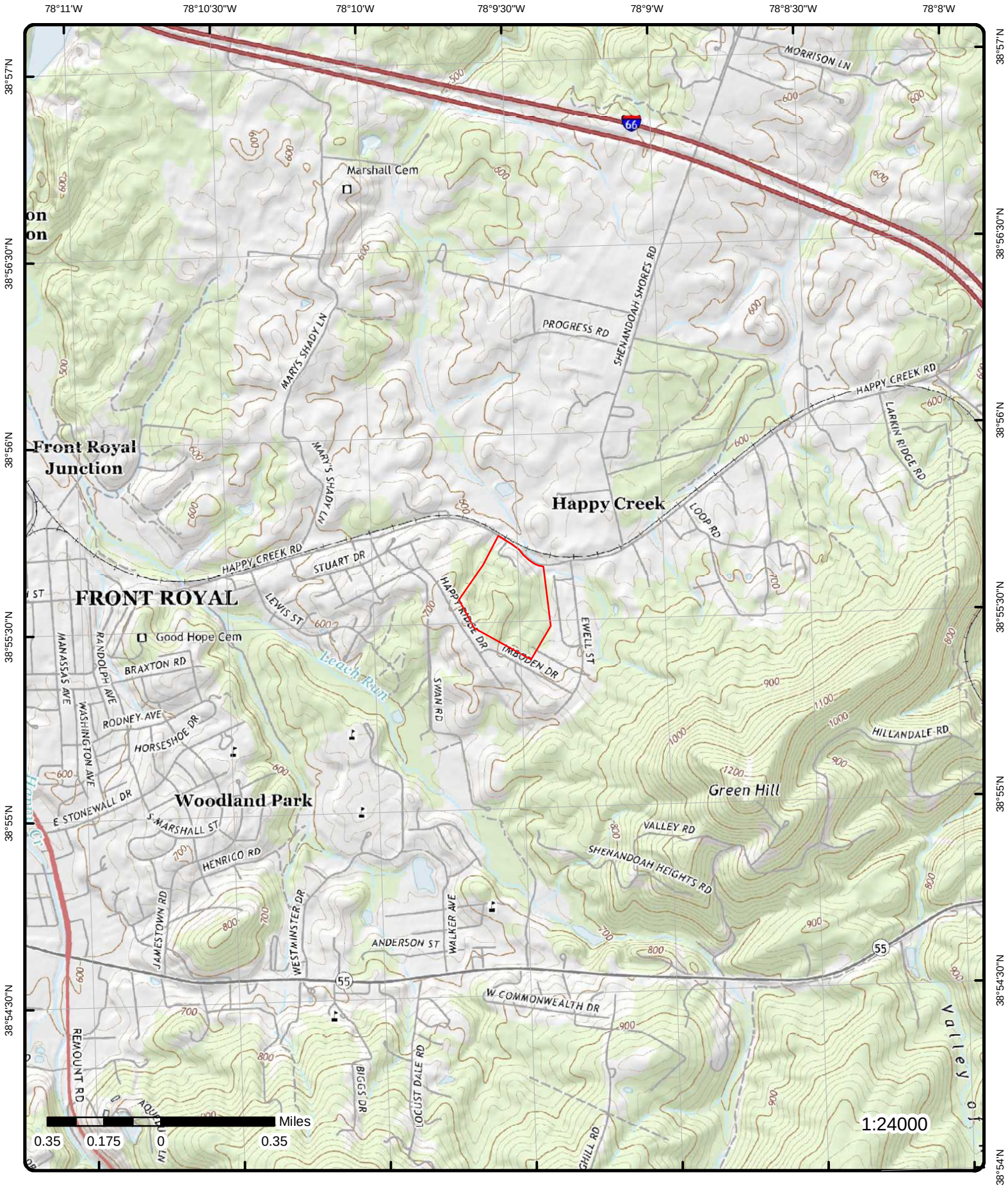
Aerial **Year: 2022**

Order Number: 23100200645

Address: 1321 Happy Creek Road, Front Royal, VA

© ERIS Information Inc.

Source: ESRI World Imagery



Topographic Map

Year: 2019

Order Number: 23100200645

Address: 1321 Happy Creek Road, VA

Quadrangle(s): Linden VA, Front Royal VA

Source: USGS Topographic Map

© ERIS Information Inc.

Detail Report

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	1 of 1	ENE	0.09 / 455.04	642.87 / -45	Retention Pond Equipment Washout Happy Creek Road x Ewell Street , Front Royal Front Royal VA	SPILLS

Legacy IR No:	2017-V-3503	**Incident ID:**	99468
Status:	Closed	**Incident Address 1:**	Happy Creek Road x Ewell Street , Front Royal
Incident Type:	Point Source(Water), SW Construction(Water), Water(Water)	**Incident Address 2:**	
Incident Subtype:		**FIPS City County:**	187/Warren County
Effect to Receptor:		**Region:**	Valley
Incident Dte Time:	06/01/2017 11:45	**Closure Date:**	9/12/2017
CallRecvdDteTime:	06/02/2017 01:57	**Impacts:**	
OngoingAtCallDt?:	Yes	**Other Impacts:**	
EPA ID:		**Steps Taken:**	
SSORS ID:		**System Structure:**	
HMVA No:		**Oth Sys Structure:**	
NRC ID:		**Weather Status:**	
Agencies Notified?:		**Wet Weather Event:**	No
Threat to:		**Precipitation Inch:**	0
Terrorism?:		**Discharge Type:**	
Charactriz Incdnt:	Unknown	**Dischrg Vol Gal:**	0
Quantity Units:		**Discharge Treated:**	
High Qty to Water:		**Unkwn Discharge?:**	
Low Qty to Water:		**Sewage Related?:**	No
Water Body:	Retention Pond	**Permitted?:**	No
CallReportedAnon?:		**Facility Name:**	
CallPrptyOwnrUnkn?:		**Property Owner:**	
Call PRP Unknown?:		**PrprtyOwnrOrgnztn:**	
Call Rprtd by Org?:		**Event Duration Hrs:**	0
CallPrprtyOwnrOrg:		**Received By:**	Graham Simmerman
Call Prop Owner Nm:		**Materials:**	
CallReprtdByName:	Shawn Ellifritz	**PRP Name:**	
Call PRP Name:		**Participating Prgm:**	
Call PRP Org:	Branch Highways	**Point X:**	
PRP Organization:		**Point Y:**	
Associated IR:		**Steps Taken Desc:**	

Incident Name: Retention Pond Equipment Washout
Weather Event:
Other Receptors:
Other Agencies:
Originial Call Loc Desc: Happy Creek Road x Ewell Street, Front Royal
Original Call Material Desc: Equipment washwater
Cause of Event:
Location Description: Happy Creek Road x Ewell Street, Front Royal
Closure Reason Comments: On June 1, 2017 the complaint was referred to Warren County as the ESCP authority.
Description of Incident: . For over a year, Branch Highways has been doing site work on the parkway and the high school near this location and has been washing off their equipment into the retention pond at this location. It's going on now. Mr. Ellifritz is responsible for maintaining the retention pond and wants someone to stop Branch Highways from washing off their equipment into the pond.
Original Call Incident Descri:

. For over a year, Branch Highways has been doing site work on the parkway and the high school near this location and has been washing off their equipment into the retention pond at this location. It's going on now. Mr. Ellifritz is responsible for maintaining the retention pond and wants someone to stop Branch Highways from washing off their equipment into the pond.

Site Summary Notes:

Corrective Action Taken:

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
2	1 of 2	SE	0.24 / 1,251.99	712.86 / 25	WARREN MEMORIAL HOSPITAL 351 VALLEY HEALTH WAY FRONT ROYAL VA 22630	RCRA SQG

EPA Handler ID:	VAR000536961
Gen Status Universe:	Small Quantity Generator
Contact Name:	ADAM B RIVERA
Contact Address:	351 , VALLEY HEALTH WAY , , FRONT ROYAL , VA, 22630 , US
Contact Phone No and Ext:	540-532-3915
Contact Email:	ARIVERA2@VALLEYHEALTHLINK.COM
Contact Country:	US
County Name:	WARREN
EPA Region:	03
Land Type:	Private
Receive Date:	20230104
Location Latitude:	38.919968
Location Longitude:	-78.1533

Violation/Evaluation Summary

Note:	NO RECORDS: As of Jul 2023, there are no Compliance Monitoring and Enforcement (violation) records associated with this facility (EPA ID).

Handler Summary

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility:	No
Onsite Burner Exemption:	No
Furnace Exemption:	No
Underground Injection Activity:	No
Commercial TSD:	No
Used Oil Transporter:	No
Used Oil Transfer Facility:	No
Used Oil Processor:	No
Used Oil Refiner:	No
Used Oil Burner:	No
Used Oil Market Burner:	No
Used Oil Spec Marketer:	No

Hazardous Waste Handler Details

Sequence No:	1
Receive Date:	20210205
Handler Name:	WARREN MEMORIAL HOSPITAL
Federal Waste Generator Code:	2
Generator Code Description:	Small Quantity Generator
Source Type:	Notification

Waste Code Details

Hazardous Waste Code:	D018
Waste Code Description:	BENZENE
Hazardous Waste Code:	P001
Waste Code Description:	2H-1-BENZOPYRAN-2-ONE, 4-HYDROXY-3-(3-OXO-1-PHENYLBUTYL)-, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3% (OR) WARFARIN, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3%
Hazardous Waste Code:	P042
Waste Code Description:	1,2-BENZENEDIOL, 4-[1-HYDROXY-2-(METHYLAMINO)ETHYL]-, (R)- (OR) EPINEPHRINE

Hazardous Waste Code: P075
Waste Code Description: NICOTINE, & SALTS (OR) PYRIDINE, 3-(1-METHYL-2-PYRROLIDINYL)-,(S)-, & SALTS

Hazardous Waste Code: P081
Waste Code Description: 1,2,3-PROPANETRIOL, TRINITRATE (R) (OR) NITROGLYCERINE (R)

Hazardous Waste Code: P105
Waste Code Description: SODIUM AZIDE

Hazardous Waste Code: P204
Waste Code Description: PHYSOSTIGMINE (OR) PYRROLO[2,3-B]INDOL-5-OL, 1,2,3,3A,8,8A-HEXAHYDRO-1,3A,8-TRIMETHYL-METHYLCARBAMATE (ESTER), (3AS-CIS)-

Hazardous Waste Code: U001
Waste Code Description: ACETALDEHYDE (I) (OR) ETHANAL (I)

Hazardous Waste Code: U002
Waste Code Description: 2-PROPANONE (I) (OR) ACETONE (I)

Hazardous Waste Code: U019
Waste Code Description: BENZENE (I,T)

Hazardous Waste Code: U031
Waste Code Description: 1-BUTANOL (I) (OR) N-BUTYL ALCOHOL (I)

Hazardous Waste Code: U044
Waste Code Description: CHLOROFORM (OR) METHANE, TRICHLORO-

Hazardous Waste Code: U108
Waste Code Description: 1,4-DIETHYLENEOXIDE (OR) 1,4-DIOXANE

Hazardous Waste Code: U115
Waste Code Description: ETHYLENE OXIDE (I,T) (OR) OXIRANE (I,T)

Hazardous Waste Code: U122
Waste Code Description: FORMALDEHYDE

Hazardous Waste Code: U123
Waste Code Description: FORMIC ACID (C,T)

Hazardous Waste Code: U154
Waste Code Description: METHANOL (I) (OR) METHYL ALCOHOL (I)

Hazardous Waste Code: U205
Waste Code Description: SELENIUM SULFIDE (OR) SELENIUM SULFIDE SES2 (R,T)

Hazardous Waste Code: U220
Waste Code Description: BENZENE, METHYL- (OR) TOLUENE

Hazardous Waste Code: U239
Waste Code Description: BENZENE, DIMETHYL- (I,T) (OR) XYLENE (I)

Hazardous Waste Handler Details

Sequence No: 2
Receive Date: 20230104
Handler Name: WARREN MEMORIAL HOSPITAL
Federal Waste Generator Code: 2
Generator Code Description: Small Quantity Generator
Source Type: Notification

Waste Code Details

Hazardous Waste Code: D018
Waste Code Description: BENZENE

Hazardous Waste Code: P001
Waste Code Description: 2H-1-BENZOPYRAN-2-ONE, 4-HYDROXY-3-(3-OXO-1-PHENYLBUTYL)-, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3% (OR) WARFARIN, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3%

Hazardous Waste Code: P042
Waste Code Description: 1,2-BENZENEDIOL, 4-[1-HYDROXY-2-(METHYLAMINO)ETHYL]-, (R)- (OR) EPINEPHRINE

Hazardous Waste Code: P075
Waste Code Description: NICOTINE, & SALTS (OR) PYRIDINE, 3-(1-METHYL-2-PYRROLIDINYL)-,(S)-, & SALTS

Hazardous Waste Code: P081
Waste Code Description: 1,2,3-PROPANETRIOL, TRINITRATE (R) (OR) NITROGLYCERINE (R)

Hazardous Waste Code: P105
Waste Code Description: SODIUM AZIDE

Hazardous Waste Code: P204
Waste Code Description: PHYSOSTIGMINE (OR) PYRROLO[2,3-B]INDOL-5-OL, 1,2,3,3A,8,8A-HEXAHYDRO-1,3A,8-TRIMETHYL-METHYLCARBAMATE (ESTER), (3AS-CIS)-

Hazardous Waste Code: U001
Waste Code Description: ACETALDEHYDE (I) (OR) ETHANAL (I)

Hazardous Waste Code: U002
Waste Code Description: 2-PROPANONE (I) (OR) ACETONE (I)

Hazardous Waste Code: U019
Waste Code Description: BENZENE (I,T)

Hazardous Waste Code: U031
Waste Code Description: 1-BUTANOL (I) (OR) N-BUTYL ALCOHOL (I)

Hazardous Waste Code: U044
Waste Code Description: CHLOROFORM (OR) METHANE, TRICHLORO-

Hazardous Waste Code: U108
Waste Code Description: 1,4-DIETHYLENEOXIDE (OR) 1,4-DIOXANE

Hazardous Waste Code: U115
Waste Code Description: ETHYLENE OXIDE (I,T) (OR) OXIRANE (I,T)

Hazardous Waste Code: U122
Waste Code Description: FORMALDEHYDE

Hazardous Waste Code: U123
Waste Code Description: FORMIC ACID (C,T)

Hazardous Waste Code: U154
Waste Code Description: METHANOL (I) (OR) METHYL ALCOHOL (I)

Hazardous Waste Code: U205
Waste Code Description: SELENIUM SULFIDE (OR) SELENIUM SULFIDE SES2 (R,T)

Hazardous Waste Code: U220
Waste Code Description: BENZENE, METHYL- (OR) TOLUENE

Hazardous Waste Code: U239
Waste Code Description: BENZENE, DIMETHYL- (I,T) (OR) XYLENE (I)

Owner/Operator Details

Owner/Operator Ind:	Current Operator	***Street No:***	
Type:	Private	***Street 1:***	P.O. BOX 3340
Name:	VALLEY HEALTH	***Street 2:***	
Date Became Current:	20210122	***City:***	WINCHESTER
Date Ended Current:		***State:***	VA
Phone:	540-536-3800	***Country:***	US

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Source Type:	Notification	**Zip Code:**	22604
Owner/Operator Ind:	Current Owner	**Street No:**	
Type:	Private	**Street 1:**	P.O. BOX 3340
Name:	VALLEY HEALTH	**Street 2:**	
Date Became Current:	20210122	**City:**	WINCHESTER
Date Ended Current:		**State:**	VA
Phone:	540-536-3800	**Country:**	US
Source Type:	Notification	**Zip Code:**	22604

Historical Handler Details

Receive Dt:	20210205
Generator Code Description:	Small Quantity Generator
Handler Name:	WARREN MEMORIAL HOSPITAL

2	2 of 2	SE	0.24 / 1,251.99	712.86 / 25	New Warren Memorial 351 Valley Health Way Front Royal VA 22630	ALT FUELS

ID:	199227	**CNG Dispenser No:**	
Fuel Type Code:	ELEC: Electric	**CNG Site Renew Src:**	
Station Phone:	540-636-0300	**CNG Tot Compr Cap:**	
Expected Date:		**CNG Storage Cap:**	
BD Blends:		**CNG Fill Type Code:**	
NG PSI:		**CNG PSI:**	
Federal Agency ID:		**CNG Vehicle Class:**	
Open Date:	2021-10-27	**LNG Site Renew Src:**	
Hydrogen is Retail:		**LNG Vehicle Class:**	
Federal Agency:		**LPG Nozzle Types:**	
Facility Type:	HOSPITAL	**Hydrogen Pressures:**	
Dt Last Confirmed:	2021-11-04	**Hydrogen Standards:**	
Updated at:	2022-02-10 19:42:29 UTC	**Latitude:**	38.9190842
Access Code:	public	**Longitude:**	-78.15435

Access Detail Code:	
Groups with Access Code:	Public
Groups with Access Code Fr:	Public
Fed Agency Name:	
Hydrogen Status Link:	
E85 Other Ethanol Blends:	
NPS Unit Name:	
Cards Accepted:	
CNG Statn Sells Renewable Na:	
LNG Statn Sells Renewable Na:	
Maximum Vehicle Class:	LD
RD Blended With Biodiesel:	
RD Blends:	
RD Blends French:	
RD Maximum Biodiesel Level:	
Status:	Open: The station is open.
Owner Type Desc:	Privately owned
E85 Blender Pump Desc:	
NG Fill Type Desc:	
NG Vehicle Class Desc:	
Geocode Status Desc:	The location is from a real GPS readout at the station.
Group with Access Desc:	Publicly available to all customers.
LPG Primary Desc:	
Intersection Directions:	
Access Days Time:	24 hours daily
Restricted Access:	false

3	1 of 1	ENE	0.37 / 1,967.09	641.18 / -46	Heinrich Kahrs Residence 1656 Happy Creek Rd Front Royal VA 22630	LST

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

PC No :	20056106	**Fed Regulated UST:**	No
PC No (HUB):	20056106	**Reg Petrol UST 1:**	No
CEDS Fac ID:	200000220221	**Excluded UST 1:**	No
Program:	RP Lead	**Deferred UST 1:**	No
Region:	VRO	**Partial Defr UST 1:**	No
Case Status:	Closed	**Exmpt 1 UST 2:**	No
Case Closed Date:	9/19/2006	**Exmpt2 Ht Oil UST2:**	No
Release Reported:	2/26/2005	**Small Ht Oil AST 2:**	Yes
Heat Oil Category:	Category 3	**Regulated AST3:**	No
Unknown Tank Type:	No	**Unregulated AST3:**	No
Site Name:	Heinrich Kahrs Residence		
Address :	1656 Happy Creek Rd		
City :	Front Royal		
Zip:	22630		
County :	Warren County		
RST Name (HUB):	Heinrich Kahrs Residence		
Fac L Addr 1 (HUB):	1656 Happy Creek Rd		
Fac L City (HUB):	Front Royal		
Fac L ZIP 5 (HUB):	22630		
FIC Desc (HUB):	Warren County		
Other Tank Type:	No		
Oth Tank Type Desc:			
Source:	Virginia DEQ - Petroleum Database - Petroleum Releases; Virginia Environmental Data Hub - Petroleum Release Sites		

Data Hub - Petroleum Releases Geodatabase Details

RST ID:	25040	**RST Response:**	
RST Fac ID:	200000220221	**RST Responsibi Ind:**	RP Lead
RST Poll Cmplt No:	20056106	**DES First Name:**	David
RST Status Ind:	Closed	**DES Last Name:**	Forrer
RST Rls Reported:	2005/02/26 00:00:00+00	**Reference Point:**	
RST Case Closed:	2006/09/19 00:00:00+00	**Latitude:**	38.9281400809367
RST Suspect Cnfrmd:	Confirmed	**Longitude:**	-78.1495755981815
RST Rec Code:	VRO	**X:**	-8699570.9613
RST Priority:	1	**Y:**	4711383.4766
RST Fed Reg Tank:	N		
RST Name:	Heinrich Kahrs Residence		
Fac Location:	1656 Happy Creek Rd		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
4	1 of 1	SSE	0.73 / 3,847.51	773.95 / 87	HAPPY CREEK MINES WARREN COUNTY FRONT ROYAL VA 22630	MRDS

Dep ID:	10080697	**I1:**	24
Dev Status:	PAST PRODUCER	**Latitude:**	38.913086
Code List:	FE MN	**Longitude:**	-78.154419
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10080697		

Commodity

I1:	19	**Line:**	1
Code:	FE	**Inserted By:**	MRDS migration
Commodity:	Iron	**Insert Date:**	29-OCT-2002 09:00:24
Commodity Type:	Metallic	**Updated By:**	USGS
Commodity Group:	Iron	**Update Date:**	29-OCT-2002 09:02:45
Importance:	Primary		

I1:	22	**Line:**	2
Code:	MN	**Inserted By:**	MRDS migration
Commodity:	Manganese	**Insert Date:**	29-OCT-2002 09:00:24
Commodity Type:	Metallic	**Updated By:**	USGS
Commodity Group:	Manganese	**Update Date:**	29-OCT-2002 09:01:03
Importance:	Secondary		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Materials

I1:	12	***Inserted B:***	MRDS migration
Material:	Limonite	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	3	***Update Dat:***	
I1:	87	***Inserted B:***	MRDS migration
Material:	Goethite	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	2	***Update Dat:***	
I1:	87	***Inserted B:***	MRDS migration
Material:	Pyrolusite	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	4	***Update Dat:***	
I1:	87	***Inserted B:***	MRDS migration
Material:	Chert	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Gangue	***Updated By:***	
Rec:	1	***Update Dat:***	

Names

I1:	21	***Inserted By:***	MRDS migration
Status:	Current	***Insert Date:***	29-OCT-02
Site Name:	Happy Creek Mines	***Updated By:***	USGS
Line:	1	***Update Date:***	29-OCT-02

5	*1 of 1*	*SSE*	*0.74 / 3,912.02*	*771.84 / 84*	***SEIBEL IRON MINES, INC. MINE*** ***WARREN COUNTY*** ***FRONT ROYAL VA 22630***	***MRDS***

Dep ID:	10179410	***I1:***	22
Dev Status:	PAST PRODUCER	***Latitude:***	38.912903
Code List:	FE	***Longitude:***	-78.154419
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10179410		

Commodity

I1:	13	***Line:***	1
Code:	FE	***Inserted By:***	MAS migration
Commodity:	Iron	***Insert Date:***	29-OCT-2002 09:00:24
Commodity Type:	Metallic	***Updated By:***	USGS
Commodity Group:	Iron	***Update Date:***	29-OCT-2002 09:01:43
Importance:	Primary		

Names

I1:	38	***Inserted By:***	MAS migration
Status:	Current	***Insert Date:***	29-OCT-02
Site Name:	Seibel Iron Mines, Inc. Mine	***Updated By:***	USGS
Line:	1	***Update Date:***	29-OCT-02

6	*1 of 1*	*SSE*	*0.81 / 4,257.56*	*742.77 / 55*	***SEIBEL IRON MINES, INC. MINE*** ***WARREN COUNTY*** ***FRONT ROYAL VA 22630***	***MRDS***

Dep ID:	10203803	***I1:***	16
Dev Status:	PAST PRODUCER	***Latitude:***	38.911926
Code List:	FE	***Longitude:***	-78.154419
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10203803		

Commodity

I1:	81	***Line:***	1
Code:	FE	***Inserted By:***	MAS migration
Commodity:	Iron	***Insert Date:***	29-OCT-2002 09:00:24
Commodity Type:	Metallic	***Updated By:***	USGS
Commodity Group:	Iron	***Update Date:***	29-OCT-2002 09:01:53
Importance:	Primary		

Names

I1:	38	***Inserted By:***	MAS migration
Status:	Current	***Insert Date:***	29-OCT-02
Site Name:	Seibel Iron Mines, Inc. Mine	***Updated By:***	USGS
Line:	1	***Update Date:***	29-OCT-02

7	1 of 1	E	0.87 / 4,573.89	711.14 / 24	SEIBLE MINE WARREN COUNTY FRONT ROYAL VA 22630	MRDS

Dep ID:	10080696	***I1:***	75
Dev Status:	PAST PRODUCER	***Latitude:***	38.927124
Code List:	MN FE	***Longitude:***	-78.140808
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10080696		

Commodity

I1:	21	***Line:***	1
Code:	MN	***Inserted By:***	MRDS migration
Commodity:	Manganese	***Insert Date:***	29-OCT-2002 09:00:24
Commodity Type:	Metallic	***Updated By:***	USGS
Commodity Group:	Manganese	***Update Date:***	29-OCT-2002 09:01:03
Importance:	Primary		

I1:	21	***Line:***	2
Code:	FE	***Inserted By:***	MRDS migration
Commodity:	Iron	***Insert Date:***	29-OCT-2002 09:00:24
Commodity Type:	Metallic	***Updated By:***	USGS
Commodity Group:	Iron	***Update Date:***	29-OCT-2002 09:01:03
Importance:	Tertiary		

Materials

I1:	47	***Inserted B:***	MRDS migration
Material:	Manganite	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	3	***Update Dat:***	
I1:	23	***Inserted B:***	MRDS migration
Material:	Wad	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	6	***Update Dat:***	
I1:	87	***Inserted B:***	MRDS migration
Material:	Chert	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Gangue	***Updated By:***	
Rec:	1	***Update Dat:***	
I1:	12	***Inserted B:***	MRDS migration
Material:	Pyrolusite	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	5	***Update Dat:***	
I1:	87	***Inserted B:***	MRDS migration

Material:	Limonite	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	2	***Update Dat:***	
I1:	87	***Inserted B:***	MRDS migration
Material:	Psilomelane	***Insert Dat:***	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	***Updated By:***	
Rec:	4	***Update Dat:***	

Names

I1:	21	***Inserted By:***	MRDS migration
Status:	Previous	***Insert Date:***	29-OCT-02
Site Name:	Happy Creek Mine	***Updated By:***	USGS
Line:	2	***Update Date:***	29-OCT-02

Names

I1:	21	***Inserted By:***	MRDS migration
Status:	Current	***Insert Date:***	29-OCT-02
Site Name:	Seible Mine	***Updated By:***	USGS
Line:	1	***Update Date:***	29-OCT-02

Unplottable Summary

Total: 0 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID

No unplottable records were found that may be relevant for the search criteria.

Unplottable Report

No unplottable records were found that may be relevant for the search criteria.

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13 and E1527-21, Section 8.1.8 Sources of Standard Source Information:

"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."

Standard Environmental Record Sources

Federal

National Priority List: NPL

Sites on the United States Environmental Protection Agency (EPA)'s National Priorities List of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

Government Publication Date: May 25, 2023

National Priority List - Proposed: PROPOSED NPL

Sites proposed by the United States Environmental Protection Agency (EPA), the state agency, or concerned citizens for addition to the National Priorities List (NPL) due to contamination by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

Government Publication Date: May 25, 2023

Deleted NPL: DELETED NPL

Sites deleted from the United States Environmental Protection Agency (EPA)'s National Priorities List. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

Government Publication Date: May 25, 2023

SEMS List 8R Active Site Inventory: SEMS

The U.S. Environmental Protection Agency's (EPA) Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted. This data includes SEMS sites from the List 8R Active file as well as applicable sites from the SEMS GIS/REST file layer obtained from EPA's Facility Registry Service.

Government Publication Date: Jul 26, 2023

Inventory of Open Dumps, June 1985: ODI

The Resource Conservation and Recovery Act (RCRA) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

Government Publication Date: Jun 1985

SEMS List 8R Archive Sites: SEMS ARCHIVE

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. This data includes sites from the List 8R Archived site file.

Government Publication Date: Jul 26, 2023

Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS: CERCLIS

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

Government Publication Date: Oct 25, 2013

EPA Report on the Status of Open Dumps on Indian Lands: IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified congressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

Government Publication Date: Dec 31, 1998

CERCLIS - No Further Remedial Action Planned: CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Government Publication Date: Oct 25, 2013

CERCLIS Liens: CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA). This database was provided by the United States Environmental Protection Agency (EPA). Refer to SEMS LIEN as the current data source for Superfund Liens.

Government Publication Date: Jan 30, 2014

RCRA CORRACTS-Corrective Action: RCRA CORRACTS

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

Government Publication Date: Jul 10, 2023

RCRA non-CORRACTS TSD Facilities: RCRA TSD

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste as defined by RCRA.

Government Publication Date: Jul 10, 2023

RCRA Generator List: RCRA LQG

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

Government Publication Date: Jul 10, 2023

RCRA Small Quantity Generators List: RCRA SQG

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Government Publication Date: Jul 10, 2023

RCRA Very Small Quantity Generators List: RCRA VSQG

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Very Small Quantity Generators (VSQG) generate 100 kilograms or less per month of hazardous waste, or one kilogram or less per month of acutely hazardous waste. Additionally, VSQG may not accumulate more than 1,000 kilograms of hazardous waste at any time.

Government Publication Date: Jul 10, 2023

RCRA Non-Generators: RCRA NON GEN

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

Government Publication Date: Jul 10, 2023

RCRA Sites with Controls: RCRA CONTROLS

List of Resource Conservation and Recovery Act (RCRA) facilities with institutional controls in place. RCRA gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

Government Publication Date: Jul 10, 2023

Federal Engineering Controls-ECs: FED ENG

This list of Engineering controls (ECs) is provided by the United States Environmental Protection Agency (EPA). ECs encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. The EC listing includes remedy component data from Superfund decision documents issued in fiscal years 1982-2021 for applicable sites on the final or deleted on the National Priorities List (NPL); and sites with a Superfund Alternative Approach (SAA) Agreement in place. The only sites included that are not on the NPL; proposed for NPL; or removed from proposed NPL, are those with an SAA Agreement in place.

Government Publication Date: Aug 23, 2023

Federal Institutional Controls- ICs: FED INST

This list of Institutional controls (ICs) is provided by the United States Environmental Protection Agency (EPA). ICs are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site. The IC listing includes remedy component data from Superfund decision documents issued in fiscal years 1982-2021 for applicable sites on the final or deleted on the National Priorities List (NPL); and sites with a Superfund Alternative Approach (SAA) Agreement in place. The only sites included that are not on the NPL; proposed for NPL; or removed from proposed NPL, are those with an SAA Agreement in place.

Government Publication Date: Aug 23, 2023

Land Use Control Information System: LUCIS

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

Government Publication Date: Sep 1, 2006

Institutional Control Boundaries at NPL sites: NPL IC

Boundaries of Institutional Control areas at sites on the United States Environmental Protection Agency (EPA)'s National Priorities List, or Proposed or Deleted, made available by the EPA's Shared Enterprise Geodata and Services (SEGS). United States Environmental Protection Agency (EPA)'s National Priorities List of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. Institutional controls are non-engineered instruments such as administrative and legal controls that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy.

Government Publication Date: May 25, 2023

Emergency Response Notification System: ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1982-1986

Emergency Response Notification System: ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1987-1989

Emergency Response Notification System: ERNS

Database of oil and hazardous substances spill reports made available by the United States Coast Guard National Response Center (NRC). The NRC fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. These data contain initial incident data that has not been validated or investigated by a federal/state response agency.

Government Publication Date: Apr 3, 2023

The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database: FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This data is provided by the United States Environmental Protection Agency (EPA) and includes Brownfield sites from the Cleanups in My Community (CIMC) web application.

Government Publication Date: Sep 13, 2022

FEMA Underground Storage Tank Listing: FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

Government Publication Date: Dec 31, 2017

Facility Response Plan: FRP

This listing contains facilities that have submitted Facility Response Plans (FRPs) to the U.S. Environmental Protection Agency (EPA). Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit FRPs. Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments. This listing includes FRP facilities from an applicable EPA FOIA file and Homeland Infrastructure Foundation-Level Data (HIFLD) data file.

Government Publication Date: May 2, 2023

Delisted Facility Response Plans: DELISTED FRP

Facilities that once appeared in - and have since been removed from - the list of facilities that have submitted Facility Response Plans (FRP) to EPA. Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit Facility Response Plans (FRPs). Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments.

Government Publication Date: May 2, 2023

Historical Gas Stations: HIST GAS STATIONS

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

Government Publication Date: Jul 1, 1930

Petroleum Refineries: REFN

List of petroleum refineries from the U.S. Energy Information Administration (EIA) Refinery Capacity Report. Includes operating and idle petroleum refineries (including new refineries under construction) and refineries shut down during the previous year located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U.S. possessions. Survey locations adjusted using public data.

Government Publication Date: Mar 9, 2023

Petroleum Product and Crude Oil Rail Terminals: BULK TERMINAL

List of petroleum product and crude oil rail terminals made available by the U.S. Energy Information Administration (EIA). Includes operable bulk petroleum product terminals located in the 50 States and the District of Columbia with a total bulk shell storage capacity of 50,000 barrels or more, and/or the ability to receive volumes from tanker, barge, or pipeline; also rail terminals handling the loading and unloading of crude oil that were active between 2017 and 2018. Petroleum product terminals comes from the EIA-815 Bulk Terminal and Blender Report, which includes working, shell in operation, and shell idle for several major product groupings. Survey locations adjusted using public data.

Government Publication Date: Jun 29, 2022

LIEN on Property: SEMS LIEN

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System (SEMS) provides Lien details on applicable properties, such as the Superfund lien on property activity, the lien property information, and the parties associated with the lien.

Government Publication Date: Jul 26, 2023

Superfund Decision Documents: SUPERFUND ROD

This database contains a list of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include completed Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD) for active and archived sites stored in the Superfund Enterprise Management System (SEMS), along with other associated memos and files. This information is maintained and made available by the U.S. Environmental Protection Agency.

Government Publication Date: May 25, 2023

Formerly Utilized Sites Remedial Action Program: DOE FUSRAP

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

Government Publication Date: Mar 4, 2017

State

Solid Waste Landfills: SWF/LF

The solid waste program in the Department of Environmental Quality (DEQ) is designed to encourage the reuse and recycling of solid waste and to regulate the disposal and treatment of solid waste, including regulated medical waste, and to ensure that hazardous waste is properly managed. Standards are designed to protect human health and the environment and driven by regulatory requirements.

Government Publication Date: Jun 19, 2023

Leaking Petroleum Storage Tanks: LST

This list of leaking aboveground and underground storage tank facilities is maintained by the Virginia Department of Environmental Quality (DEQ). Tank owners are required to report all releases to the appropriate regional DEQ office promptly so that staff can provide guidance. The facilities included on this list are sourced from the DEQ's Clean Up Activities Petroleum Release file and applicable Open Data Portal layer file.

Government Publication Date: Jul 19, 2023

Delisted Leaking Petroleum Storage Tanks: DELISTED LST

Facilities which have been removed from the list of leaking petroleum storage tanks made available by the Virginia Department of Environmental Quality (DEQ). Facilities may be removed from the lists of leaking petroleum tanks when it is determined that the release reported is not an actual release, or the released substance is not petroleum - these sites may still have endured non-petroleum hazardous substance releases.

Government Publication Date: Jul 19, 2023

Underground Storage Tanks: UST

This list of underground storage tank (UST) facilities is provided by the Virginia Department of Environmental Quality (DEQ). The listing includes applicable facilities from the DEQ's Tank Registration file/s, Open Data Portal layer file/s, and also the Red Tagged Facility list where the DEQ prohibits fuel deliveries at these facilities which are not in compliance with the UST regulations. When the DEQ places a red tag on a tank, fuel deliveries to the tagged tank are not allowed until the violations have been fixed.

Government Publication Date: Jul 19, 2023

Aboveground Storage Tanks: AST

This list of aboveground storage tank facilities is provided by the Virginia Department of Environmental Quality (DEQ). The listing includes applicable facilities from the DEQ's Tank Registration files as well as applicable Open Data Portal layer file/s.

Government Publication Date: Jul 19, 2023

Storage Tank Facilities: TANK

This list of storage tank facilities where tank details are not available, such as tank type not distinguished as aboveground or underground, is provided by the Virginia Department of Environmental Quality (DEQ). The listing includes applicable facilities from the DEQ's Land & Waste Division Tank Registration files as well as Open Data Portal layer files.

Government Publication Date: Jul 19, 2023

Delisted Tanks: DELISTED TANK

Facilities which have been removed from the list of registered aboveground and/or underground storage tanks made available by the Virginia Department of Environmental Quality (DEQ). Facilities may be removed from the lists of registered tanks when it is determined that the tank does not require registration, for example, due to capacity or contents.

Government Publication Date: Jul 19, 2023

Institutional Controls: INST

Institutional controls are legal or contractual restrictions on property use that remain effective after remediation is completed and are used to satisfy remediation levels. This list is maintained by the Department of Environmental Quality (DEQ).

Government Publication Date: Jun 29, 2023

Voluntary Remediation Program: VRP

The Voluntary Remediation Program is to encourage hazardous substance cleanups that might not otherwise take place. The program is a streamlined mechanism for site owners or operators to voluntarily address contamination at sites with concurrence from the Department of Environmental Quality (DEQ).

Government Publication Date: Jun 29, 2023

Brownfields Site Specific Assessments: BROWNFIELDS

Brownfields are idled, underutilized, or abandoned industrial or commercial properties where expansion or redevelopment is complicated by real or perceived environmental contamination. Examples include factories, railyards, landfills, dry cleaners, etc. This list is maintained by the Department of Environmental Quality (DEQ).

Government Publication Date: Jan 8, 2021

Tribal

Leaking Underground Storage Tanks (LUSTs) on Tribal/Indian Lands: INDIAN LUST

This list of leaking underground storage tanks (LUSTs) on Tribal/Indian Lands in Region 3, which includes Virginia, is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Apr 12, 2019

Underground Storage Tanks (USTs) on Indian Lands: INDIAN UST

This list of underground storage tanks (USTs) on Tribal/Indian Lands in Region 3, which includes Virginia, is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: May 4, 2018

Delisted Tribal Leaking Storage Tanks: DELISTED INDIAN LST

Leaking Underground Storage Tank (LUST) facilities which once appeared on - and have since been removed from - the Regional Tribal/Indian LUST lists made available by the United States Environmental Protection Agency (EPA).
Government Publication Date: Apr 26, 2023

Delisted Tribal Underground Storage Tanks: DELISTED INDIAN UST

Underground Storage Tank (UST) facilities which once appeared on - and have since been removed from - the Regional Tribal/Indian UST lists made available by the United States Environmental Protection Agency (EPA).
Government Publication Date: Apr 26, 2023

County

No County standard environmental record sources available for this State.

Additional Environmental Record Sources

Federal

Facility Registry Service/Facility Index: FINDS/FRS

The Facility Registry Service (FRS) is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, and data collected from EPA's Central Data Exchange registrations and data management personnel. This list is made available by the U.S. Environmental Protection Agency (EPA).
Government Publication Date: Mar 2, 2023

Toxics Release Inventory (TRI) Program: TRIS

The U.S. Environmental Protection Agency's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of toxic chemicals from U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. There are currently 770 individually listed chemicals and 33 chemical categories covered by the TRI Program. Facilities that manufacture, process or otherwise use these chemicals in amounts above established levels must submit annual reporting forms for each chemical. Note that the TRI chemical list does not include all toxic chemicals used in the U.S. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment.
Government Publication Date: Oct 19, 2022

PFOA/PFOS Contaminated Sites: PFAS NPL

This list of National Priorities List (NPL) and related Superfund Alternative Agreement (SAA) sites where PFOA or PFOS contaminants have been detected in water and/or soil is provided by the U.S. Environmental Protection Agency (EPA). EPA Disclaimer with FOIA file: Inclusion on the list does not necessarily mean that drinking water has been affected, nor does inclusion mean that anyone at the site has been exposed or is at risk for detrimental health effects.
Government Publication Date: Jun 15, 2023

Federal Agency Locations with Known or Suspected PFAS Detections: PFAS FED SITES

List of Federal agency locations with known or suspected detections of Per- and Polyfluoroalkyl Substances (PFAS), made available by the U.S. Environmental Protection Agency (EPA) in their PFAS Analytic Tools data. EPA outlines that these data are gathered from several federal entities, such as the Federal Superfund program, Department of Defense (DOD), National Aeronautics and Space Administration, Department of Transportation, and Department of Energy. The dates this data was extracted for the PFAS Analytic Tools range from March 2022 to April 2023. Sites on this list do not necessarily reflect the source/s of PFAS contamination and detections do not indicate level of risk or human exposure at the site. Agricultural notifications in this data are limited to DOD sites only. At this time, the EPA is aware that this list is not comprehensive of all Federal agencies.
Government Publication Date: Apr 24, 2023

SSEHRI PFAS Contamination Sites: PFAS SSEHRI

This PFAS Contamination Site Tracker database is compiled by the Social Science Environmental Health Research Institute (SSEHRI) at Northeastern University. According to the SSEHRI, the database records qualitative and quantitative data from each known site of PFAS contamination, including timeline of discovery, sources, levels, health impacts, community response, and government response. The goal of this database is to compile information and support public understanding of the rapidly unfolding issue of PFAS contamination. All data presented was extracted from government websites, news articles, or publicly available documents, and this is cited in the tracker. Locations for the Known PFAS Contamination Sites are sourced from the PFAS Sites and Community Resources Map, credited to the Northeastern University's PFAS Project Lab, Silent Spring Institute, and the PFAS-REACH team. Disclaimer: The source conveys the data undergoes regular updates as new information becomes available, some sites may be missing and/or contain information that is incorrect or outdated, as well as their information represents all contamination sites SSEHRI is aware of, not all possible contamination sites. This data is not intended to be used for legal purposes. Access the following source link for the most current information: https://pfasproject.com/pfas-sites-and-community-resources/

Government Publication Date: Oct 9, 2022

National Response Center PFAS Spills: ERNS PFAS

This Per- and Poly-Fluoroalkyl Substances (PFAS) Spills dataset is made available via the U.S. Environmental Protection Agency's (EPA) PFAS Analytic Tools. The National Response Center (NRC), operated by the U.S. Coast Guard, serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the "Material Involved" or "Incident Description" fields. Limitations: The data from the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Keyword searches may misidentify some incident reports that do not contain PFAS. This dataset should also not be considered to be exhaustive of all PFAS spills/release incidents.

Government Publication Date: Apr 15, 2023

PFAS NPDES Discharge Monitoring: PFAS NPDES

This list of National Pollutant Discharge Elimination System (NPDES) permitted facilities with required monitoring for Per- and Polyfluoroalkyl (PFAS) Substances is made available via the U.S. Environmental Protection Agency (EPA)'s PFAS Analytic Tools. Any point-source wastewater discharger to waters of the United States must have a NPDES permit, which defines a set of parameters for pollutants and monitoring to ensure that the discharge does not degrade water quality or impair human health. This list includes NPDES permitted facilities associated with permits that monitor for Per- and Polyfluoroalkyl Substances (PFAS), limited to the years 2007 - present. EPA further advises the following regarding these data: currently, fewer than half of states have required PFAS monitoring for at least one of their permittees, and fewer states have established PFAS effluent limits for permittees. For states that may have required monitoring, some reporting and data transfer issues may exist on a state-by-state basis.

Government Publication Date: May 1, 2023

Perfluorinated Alkyl Substances (PFAS) from Toxic Release Inventory: PFAS TRI

List of Toxics Release Inventory (TRI) facilities at which the reported chemical is a per- or polyfluoroalkyl (PFAS) substance included in the U.S. Environmental Protection Agency's (EPA) consolidated PFAS Master List of PFAS Substances. Encompasses Toxics Release Inventory records included in the EPA PFAS Analytic Tools. The EPA's TRI database currently tracks information on disposal or releases of 770 individually listed toxic chemicals and 33 chemical categories from thousands of U.S. facilities and details about how facilities manage those chemicals through recycling, energy recovery, and treatment.

Government Publication Date: Oct 19, 2022

Perfluorinated Alkyl Substances (PFAS) Water Quality: PFAS WATER

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). This listing includes records from the Water Quality Portal where the characteristic (environmental measurement) is in the Environmental Protection Agency (EPA)'s consolidated Master List of PFAS Substances.

Government Publication Date: Jul 20, 2020

PFAS TSCA Manufacture and Import Facilities: PFAS TSCA

The U.S. Environmental Protection Agency (EPA) issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. This list is specific only to TSCA Manufacture and Import Facilities with reported per- and poly-fluoroalkyl (PFAS) substances. Data file is sourced from EPA's PFAS Analytic Tools TSCA dataset which includes CDR/Inventory Update Reporting data from 1998 up to 2020. Disclaimer: This data file includes production and importation data for chemicals identified in EPA's CompTox Chemicals Dashboard list of PFAS without explicit structures and list of PFAS structures in DSSTox. Note that some regulations have specific chemical structure requirements that define PFAS differently than the lists in EPA's CompTox Chemicals Dashboard. Reporting information on manufactured or imported chemical substance amounts should not be compared between facilities, as some companies claim Chemical Data Reporting Rule data fields for PFAS information as Confidential Business Information.

Government Publication Date: Jan 5, 2023

PFAS Waste Transfers from RCRA e-Manifest : PFAS E-MANIFEST

This Per- and Poly-Fluoroalkyl Substances (PFAS) Waste Transfers dataset is made available via the U.S. Environmental Protection Agency's (EPA) PFAS Analytic Tools. Every shipment of hazardous waste in the U.S. must be accompanied by a shipment manifest, which is a critical component of the cradle-to-grave tracking of wastes mandated by the Resource Conservation and Recovery Act (RCRA). According to the EPA, currently no Federal Waste Code exists for any PFAS compounds. To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: • PFAS • PFOA • PFOS • PERFL • AFFF • GENX • GEN-X (plus the Vermont state-specific waste codes). Limitations: Amount or concentration of PFAS being transferred cannot be determined from the manifest information. Keyword searches may misidentify some manifest records that do not contain PFAS. This dataset should also not be considered to be exhaustive of all PFAS waste transfers.

Government Publication Date: Apr 9, 2023

PFAS Industry Sectors: PFAS IND

This Per- and Poly-Fluoroalkyl Substances (PFAS) Industry Sectors dataset is made available via the U.S. Environmental Protection Agency's (EPA) PFAS Analytic Tools. The EPA developed the dataset from various sources that show which industries may be handling PFAS including: EPA's Enforcement and Compliance History Online (ECHO) records restricted to potential PFAS-handling industry sectors; ECHO records for Fire Training Sites identified where fire-fighting foam may have been used in training exercises; and 14 CFR Part 139 Airports compiled from historic and current records from the FAA Airport Data and Information Portal. Since July 2006, all certificated Part 139 Airports are required to have fire-fighting foam onsite that meet certain military specifications, which to date have been fluorinated (Aqueous Film Forming Foam). Limitations: Inclusion in this dataset does not indicate that PFAS are being manufactured, processed, used, or released by the facility. Listed facilities potentially handle PFAS based on their industrial profile, but are unconfirmed by the EPA. Keyword searches in ECHO for Fire Training sites may misidentify some facilities and should not be considered to be an exhaustive list of fire training facilities in the U.S.

Government Publication Date: Apr 16, 2023

Hazardous Materials Information Reporting System: HMIRS

US DOT - Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents Reports Database taken from Hazmat Intelligence Portal, U.S. Department of Transportation.

Government Publication Date: Sep 1, 2020

National Clandestine Drug Labs: NCDL

The U.S. Department of Justice ("the Department"), Drug Enforcement Administration (DEA), provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

Government Publication Date: Jul 26, 2023

Toxic Substances Control Act: TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI).

Government Publication Date: Apr 11, 2019

Hist TSCA: HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

Government Publication Date: Dec 31, 2006

FTTS Administrative Case Listing: FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

FTTS Inspection Case Listing: FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

Potentially Responsible Parties List: PRP

Early in the site cleanup process, the U.S. Environmental Protection Agency (EPA) conducts a search to find the Potentially Responsible Parties (PRPs). The EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site. This listing contains PRPs, Noticed Parties, at sites in the EPA's Superfund Enterprise Management System (SEMS).

Government Publication Date: Aug 23, 2023

State Coalition for Remediation of Drycleaners Listing: SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin. Since 2017, the SCRD no longer maintains this data, refer to applicable state source data where available.

Government Publication Date: Nov 08, 2017

Integrated Compliance Information System (ICIS): ICIS

The Integrated Compliance Information System (ICIS) database contains integrated enforcement and compliance information across most of U.S. Environmental Protection Agency's (EPA) programs. The vision for ICIS is to replace EPA's independent databases that contain enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions and a subset of the Permit Compliance System (PCS), which supports the National Pollutant Discharge Elimination System (NPDES). This information is maintained by the EPA Headquarters and at the Regional offices. A future release of ICIS will completely replace PCS and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities that support compliance and enforcement programs, including incident tracking, compliance assistance, and compliance monitoring.

Government Publication Date: Jan 21, 2023

Drycleaner Facilities: FED DRYCLEANERS

A list of drycleaner facilities from Enforcement and Compliance History Online (ECHO) data as made available by the U.S. Environmental Protection Agency (EPA), sourced from the ECHO Exporter file. The EPA tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

Government Publication Date: Apr 15, 2023

Delisted Drycleaner Facilities: DELISTED FED DRY

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: Apr 15, 2023

Formerly Used Defense Sites: FUDS

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DOD) is responsible for an environmental restoration. The FUDS Annual Report to Congress (ARC) is published by the U.S. Army Corps of Engineers (USACE). This data is compiled from the USACE's Geospatial FUDS data layers and Homeland Infrastructure Foundation-Level Data (HIFLD) FUDS dataset.

Government Publication Date: Jul 12, 2022

FUDS Munitions Response Sites: FUDS MRS

Boundaries of Munitions Response Sites (MRS), published with the Formerly Used Defense Sites (FUDS) Annual Report to Congress (ARC) by the U.S. Army Corps of Engineers (USACE). An MRS is a discrete location within a Munitions response area (MRA) that is known to require a munitions response. An MRA means any area on a defense site that is known or suspected to contain unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC). This data is compiled from the USACE's Geospatial MRS data layers and Homeland Infrastructure Foundation-Level Data (HIFLD) MRS dataset.

Government Publication Date: Jul 12, 2022

Former Military Nike Missile Sites: FORMER NIKE

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline, heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

Government Publication Date: Dec 2, 1984

PHMSA Pipeline Safety Flagged Incidents: PIPELINE INCIDENT

A list of flagged pipeline incidents made available by the U.S. Department of Transportation (US DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA regulations require incident and accident reports for five different pipeline system types.

Government Publication Date: Dec 30, 2022

Material Licensing Tracking System (MLTS): MLTS

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: May 11, 2021

Historic Material Licensing Tracking System (MLTS) sites: HIST MLTS

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

Mines Master Index File: MINES

The Master Index File (MIF) is provided by the United States Department of Labor, Mine Safety and Health Administration (MSHA). This file, which was originally created in the 1970's, contained many Mine-IDs that were invalid. MSHA removes invalid IDs from the MIF upon discovery. MSHA applicable data includes the following: all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970; mine addresses for all mines in the database except for Abandoned mines prior to 1998 from MSHA's legacy system (addresses may or may not correspond with the physical location of the mine itself); violations that have been assessed penalties as a result of MSHA inspections beginning on 1/1/2000; and violations issued as a result of MSHA inspections conducted beginning on 1/1/2000.

Government Publication Date: May 1, 2023

Surface Mining Control and Reclamation Act Sites: SMCRA

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). This inventory contains information on the type and extent of Abandoned Mine Land (AML) impacts, as well as information on the cost associated with the reclamation of those problems. The data is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed. Disclaimer: Per the OSMRE, States and tribes who enter their data into eAMLIS (AML Inventory System) may truncate their latitude and longitude so the precise location of usually dangerous AMLs is not revealed in an effort to protect the public from searching for these AMLs, most of which are on private property. If more precise location information is needed, please contact the applicable state/tribe of interest.

Government Publication Date: Jun 13, 2023

Mineral Resource Data System: MRDS

The Mineral Resource Data System (MRDS) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. The USGS has ceased systematic updates of the MRDS database with their focus more recently on deposits of critical minerals while providing a well-documented baseline of historical mine locations from USGS topographic maps.

Government Publication Date: Mar 15, 2016

DOE Legacy Management Sites: LM SITES

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) currently manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The LM manages sites with diverse regulatory drivers (statutes or programs that direct cleanup and management requirements at DOE sites) or as part of internal DOE or congressionally-recognized programs, such as but not limited to: Formerly Utilized Sites Remedial Action Program (FUSRAP), Uranium Mill Tailings Radiation Control Act (UMTRCA Title I, Tile II), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Decontamination and Decommissioning (D&D), Nuclear Waste Policy Act (NWPA). This site listing includes data exported from the DOE Office of LM's Geospatial Environmental Mapping System (GEMS). GEMS Data disclaimer: The DOE Office of LM makes no representation or warranty, expressed or implied, regarding the use, accuracy, availability, or completeness of the data presented herein.

Government Publication Date: May 25, 2023

Alternative Fueling Stations: ALT FUELS

This list of alternative fueling stations is sourced from the Alternative Fuels Data Center (AFDC). The U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy launched the AFDC in 1991 as a repository for alternative fuel vehicle performance data, which provides a wealth of information and data on alternative and renewable fuels, advanced vehicles, fuel-saving strategies, and emerging transportation technologies. The data includes Biodiesel (B20 and above), Compressed Natural Gas (CNG), Electric, Ethanol (E85), Hydrogen, Liquefied Natural Gas (LNG), Propane (LPG), and Renewable Diesel (R20 and above) fuel type locations.

Government Publication Date: Aug 30, 2023

Superfunds Consent Decrees: CONSENT DECREES

This list of Superfund consent decrees is provided by the Department of Justice, Environment & Natural Resources Division (ENRD) through a Freedom of Information Act (FOIA) applicable file. This listing includes Consent Decrees for CERCLA or Superfund Sites filed and/or as proposed within the ENRD's Case Management System (CMS) since 2010. CMS may not reflect the latest developments in a case nor can the agency guarantee the accuracy of the data. ENRD Disclaimer: Congress excluded three discrete categories of law enforcement and national security records from the requirements of the FOIA; response is limited to those records that are subject to the requirements of the FOIA; however, this should not be taken as an indication that excluded records do, or do not, exist.

Government Publication Date: Apr 19, 2023

Air Facility System: AFS

This EPA retired Air Facility System (AFS) dataset contains emissions, compliance, and enforcement data on stationary sources of air pollution. Regulated sources cover a wide spectrum; from large industrial facilities to relatively small operations such as dry cleaners. AFS does not contain data on facilities that are solely asbestos demolition and/or renovation contractors, or landfills. ECHO Clean Air Act data from AFS are frozen and reflect data as of October 17, 2014; the EPA retired this system for Clean Air Act stationary sources and transitioned to ICIS-Air.

Government Publication Date: Oct 17, 2014

Registered Pesticide Establishments: SSTS

This national list of active EPA-registered foreign and domestic pesticide and/or device-producing establishments is based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that each producing establishment must place its EPA establishment number on the label or immediate container of each pesticide, active ingredient or device produced. An EPA establishment number on a pesticide product label identifies the EPA registered location where the product was produced. The list of establishments is made available by the U.S. Environmental Protection Agency (EPA).

Government Publication Date: Mar 1, 2023

Polychlorinated Biphenyl (PCB) Transformers: PCBT

Locations of Transformers Containing Polychlorinated Biphenyls (PCBs) registered with the United States Environmental Protection Agency. PCB transformer owners must register their transformer(s) with EPA. Although not required, PCB transformer owners who have removed and properly disposed of a registered PCB transformer may notify EPA to have their PCB transformer de-registered. Data made available by EPA.

Government Publication Date: Oct 15, 2019

Polychlorinated Biphenyl (PCB) Notifiers: PCB

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

Government Publication Date: Mar 20, 2023

State

Spills: SPILLS

The Department of Environmental Quality (DEQ) Pollution Response Program (PREP), provides for responses to air, water and waste pollution incidents in order to protect human health and the environment. PREP staff often work to assist local emergency responders, other state agencies, federal agencies, and responsible parties, as may be needed, to manage pollution incidents. Oil spills, fish kills, and hazardous materials spills are examples of incidents that may involve the DEQ's PREP Program.
Government Publication Date: Jul 17, 2023

Pollution Complaint: PC SPILLS

The database contains a listing of Pollution Complaints from 1986 to 1994 that include petroleum releases and other releases on state land and waters. This list is maintained by the Department of Environmental Quality (DEQ).
Government Publication Date: 1986-1994

Dry Cleaning Facilities: DRYCLEANERS

A listing of registered drycleaners maintained by the Department of Environmental Quality.
Government Publication Date: Jul 26, 2023

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental record sources available for this State.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

Appendix IV: Historical Research Documentation

HISTORICAL AERIALS

Project Property: Happy Creek Road Parcel
1321 Happy Creek Road
Front Royal VA 22630

Project No: 47:15516-A

Requested By: ECS Limited

Order No: 23100200645

Date Completed: October 04,2023

Aerial Maps included in this report are produced by the sources listed above and are to be used for research purposes including a phase I report. Maps are not to be resold as commercial property. ERIS provides no warranty of accuracy or liability. The information contained in this report has been produced using aerial photos listed in above sources by ERIS Information Inc. (in the US) and ERIS Information Limited Partnership (in Canada), both doing business as 'ERIS'. The maps contained in this report do not purport to be and do not constitute a guarantee of the accuracy of the information contained herein. Although ERIS has endeavored to present information that is accurate, ERIS disclaims, any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence, negligence or otherwise, and for any consequences arising therefrom. Liability on the part of ERIS is limited to the monetary value paid for this report.

Environmental Risk Information Services
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1.866.517.5204 | info@erisinfo.com | erisinfo.com

Date	Source	Scale	Comments
2022	MAXAR TECHNOLOGIES	1" = 500'	
2021	United States Department of Agriculture	1" = 500'	
2018	United States Department of Agriculture	1" = 500'	
2016	United States Department of Agriculture	1" = 500'	
2014	United States Department of Agriculture	1" = 500'	
2012	United States Department of Agriculture	1" = 500'	
2011	United States Department of Agriculture	1" = 500'	
2009	United States Department of Agriculture	1" = 500'	
2008	United States Department of Agriculture	1" = 500'	
2006	United States Department of Agriculture	1" = 500'	
2005	United States Department of Agriculture	1" = 500'	
2004	United States Department of Agriculture	1" = 500'	
1997	United States Geological Survey	1" = 500'	
1989	United States Geological Survey	1" = 500'	
1984	United States Geological Survey	1" = 500'	
1977	United States Geological Survey	1" = 500'	
1972	United States Geological Survey	1" = 500'	
1960	United States Air Force	1" = 500'	
1950	Agricultural Stabilization & Conserv. Service	1" = 500'	
1945	United States Geological Survey	1" = 500'	
1937	Agricultural Stabilization & Conserv. Service	1" = 500'	

Year: 2022
Source: MAXAR
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2021
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2018
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2016
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2014
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2012
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2011
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2009
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2008
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2006
Source: USDA
Scale: 1" = 500'
Comment:

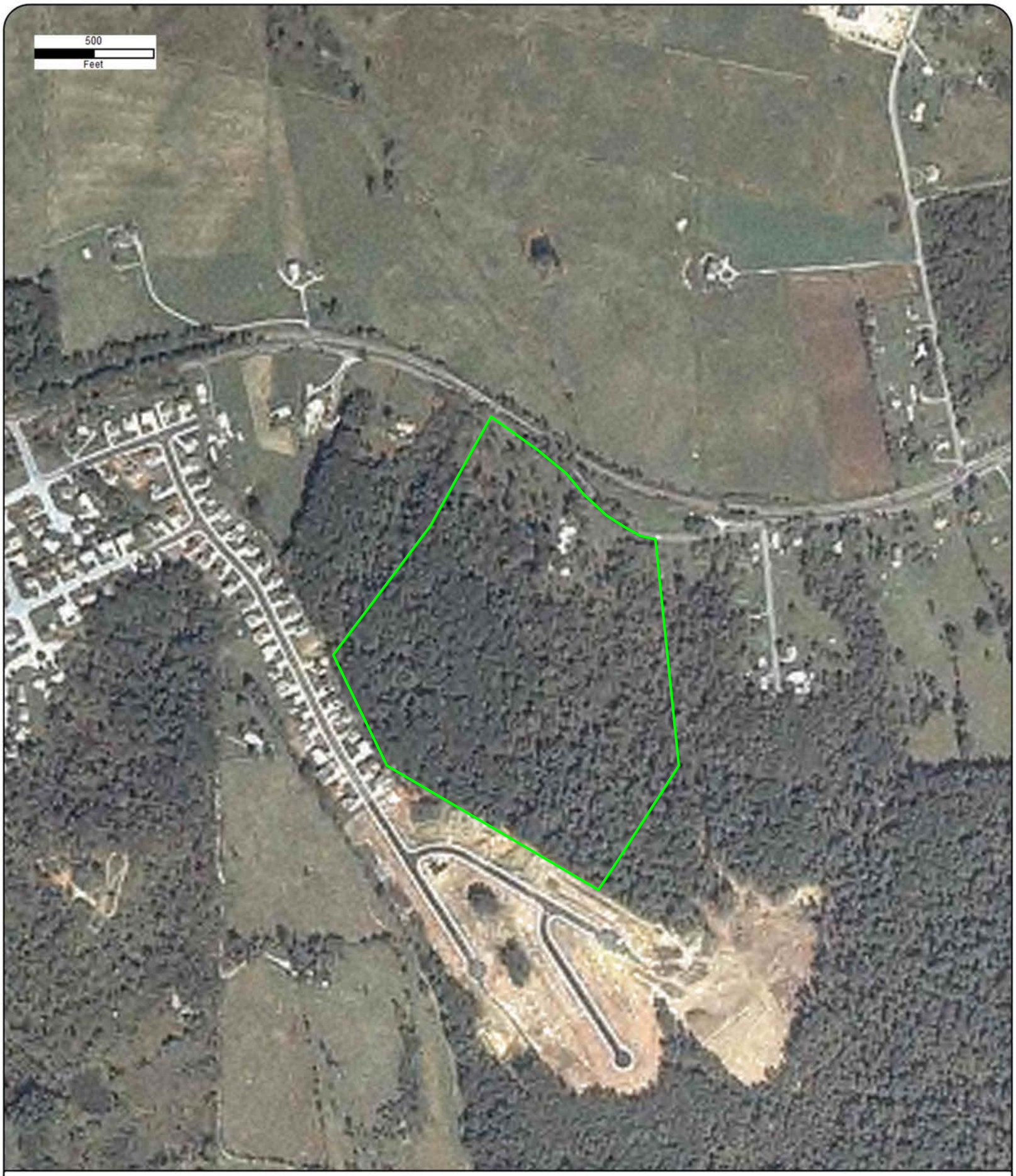
Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 2005
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645



Year: 2004
Source: USDA
Scale: 1" = 500'
Comment:

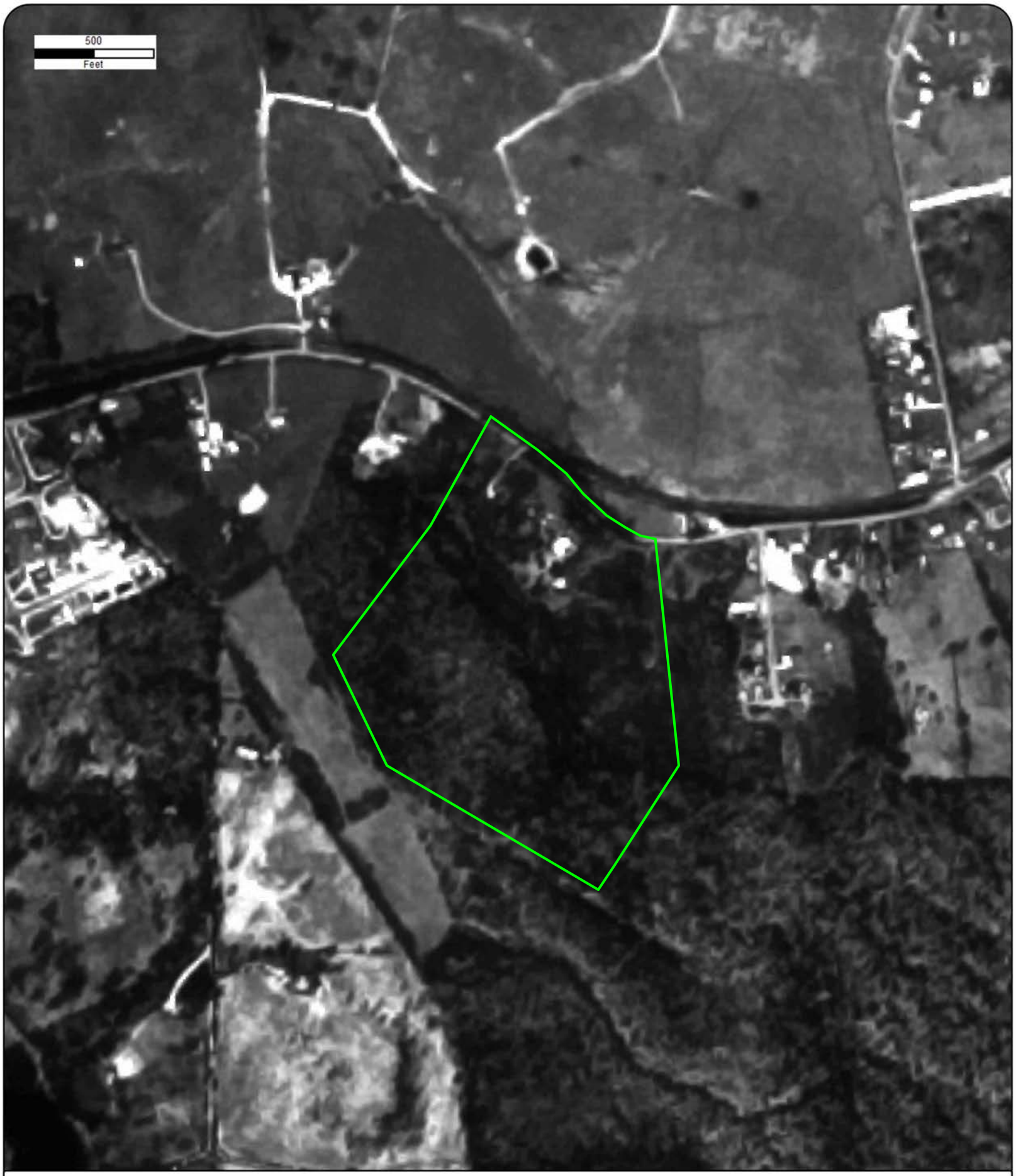
Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1997
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645



Year: 1989
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1984
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1977
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1972
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1960
Source: USAF
Scale: 1" = 500'
Comment:

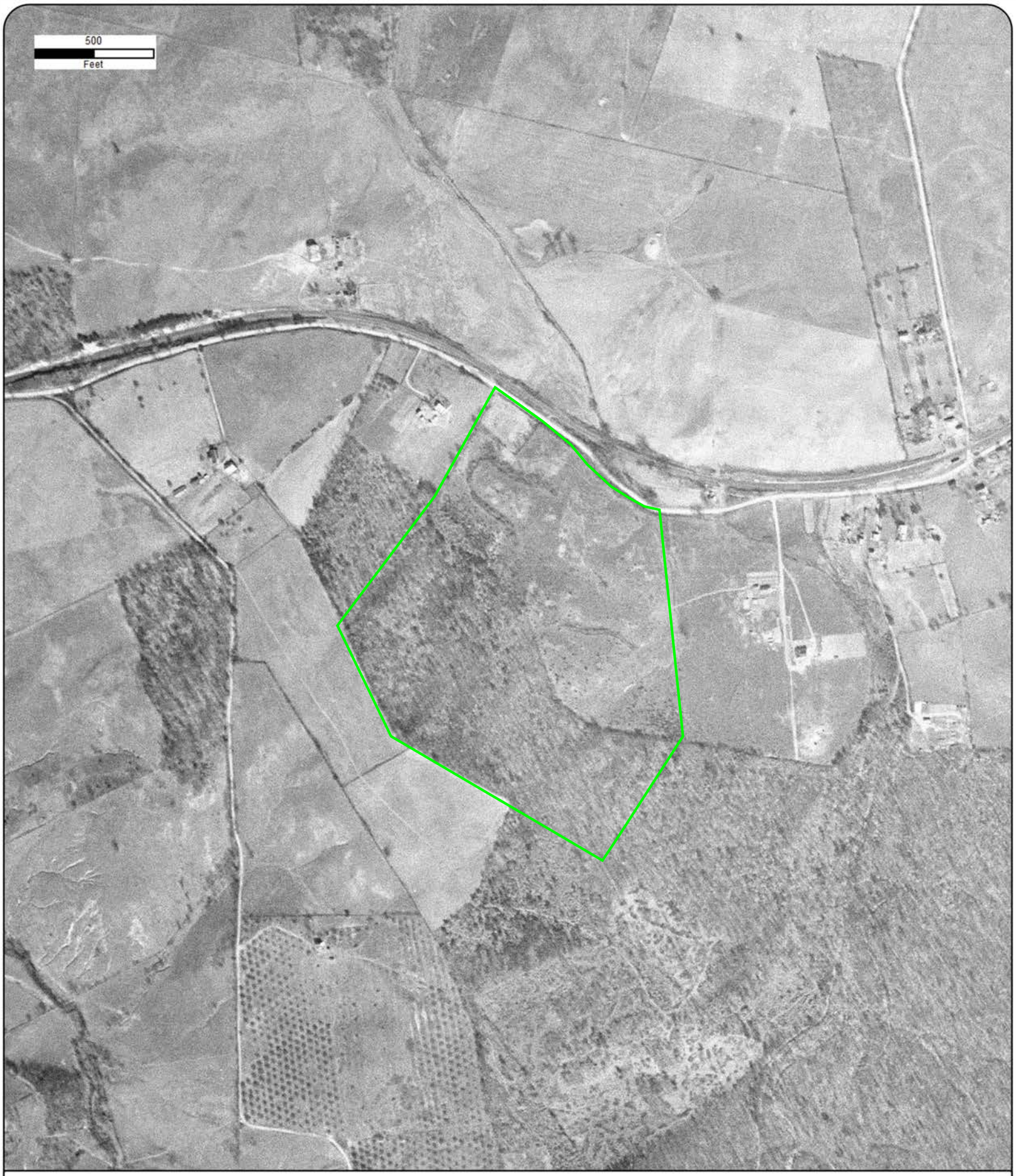
Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1950
Source: ASCS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645



Year: 1945
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

Year: 1937
Source: ASCS
Scale: 1" = 500'
Comment:

Address: 1321 Happy Creek Road, Front Royal, VA
Approx Center: -78.158987,38.92598559

Order No: 23100200645

FIRE INSURANCE MAPS

Project Property:	Happy Creek Road Parcel 1321 Happy Creek Road Front Royal VA 22630
Project No:	47:15516-A
Requested By:	ECS Limited
Order No:	23100200645
Date Completed:	October 03, 2023

Please note that no information was found for your site or adjacent properties.

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

TOPOGRAPHIC MAPS

Project Property:	Happy Creek Road Parcel 1321 Happy Creek Road Front Royal VA 22630
Project No:	47:15516-A
Requested By:	ECS Limited
Order No:	23100200645
Date Completed:	October 03, 2023

Environmental Risk Information Services
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1.866.517.5204 | info@erisinfo.com | erisinfo.com

We have searched USGS collections of current topographic maps and historical topographic maps for the project property. Below is a list of maps found for the project property and adjacent area. Maps are from 7.5 and 15 minute topographic map series, if available.

Year	Map Series
2019	7.5
2016	7.5
1994	7.5
1986	7.5
1978	7.5
1972	7.5
1967	7.5
1944	15
1939	15

Topographic Map Symbology for the maps may be available in the following documents:

Pre-1947

Page 223 of 1918 Topographic Instructions

Page 130 of 1928 Topographic Instructions

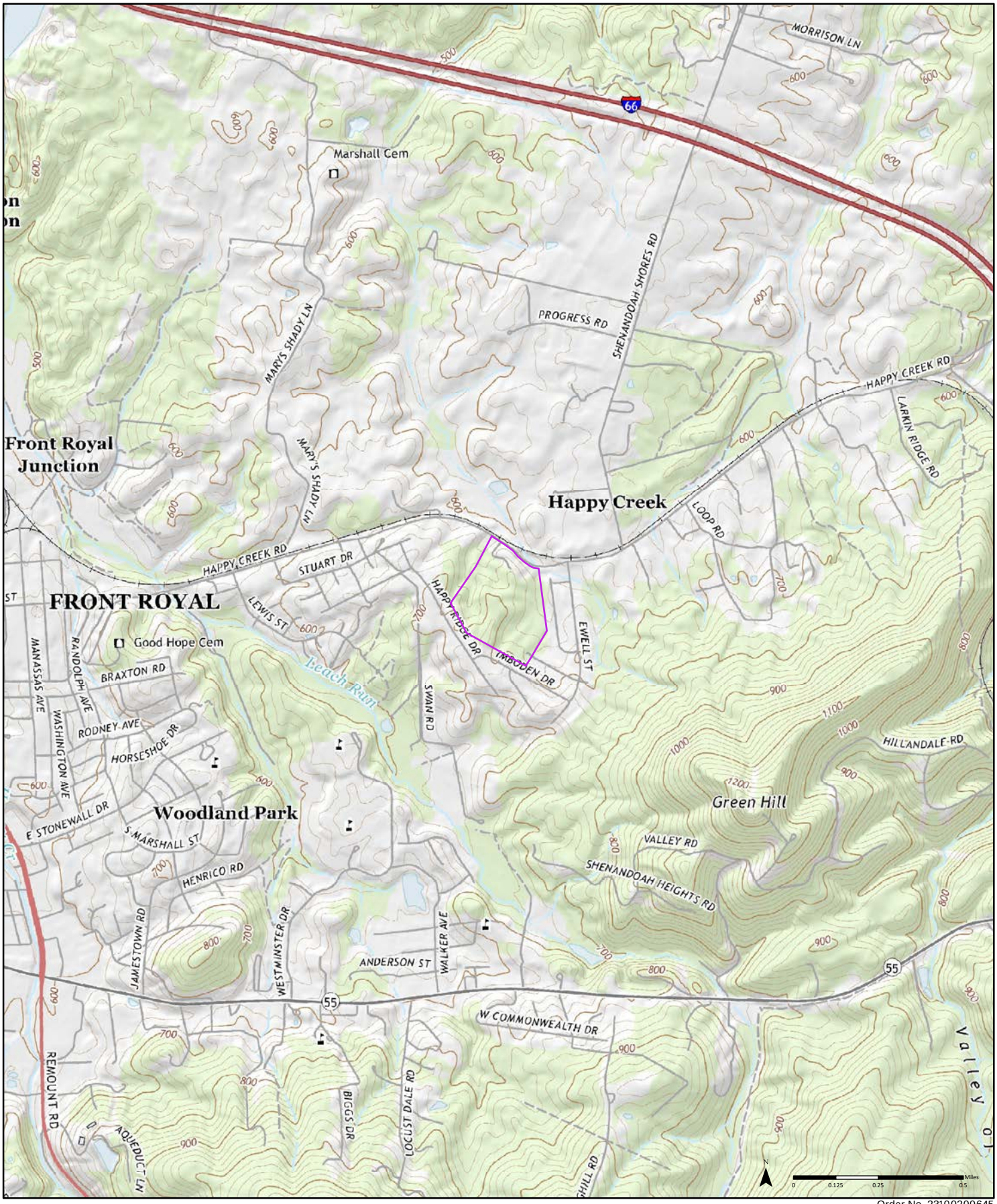
1947-2009

Topographic Map Symbols

2009-present

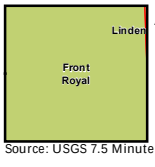
US Topo Map Symbols

Topographic Maps included in this report are produced by the USGS and are to be used for research purposes including a phase I report. Maps are not to be resold as commercial property.
No warranty of Accuracy or Liability for ERIS: The information contained in this report has been produced by ERIS Information Inc.(in the US) and ERIS Information Limited Partnership (in Canada), both doing business as 'ERIS', using Topographic Maps produced by the USGS. This maps contained herein does not purport to be and does not constitute a guarantee of the accuracy of the information contained herein. Although ERIS has endeavored to present you with information that is accurate, ERIS disclaims, any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence, negligence or otherwise, and for any consequences arising therefrom. Liability on the part of ERIS is limited to the monetary value paid for this report.



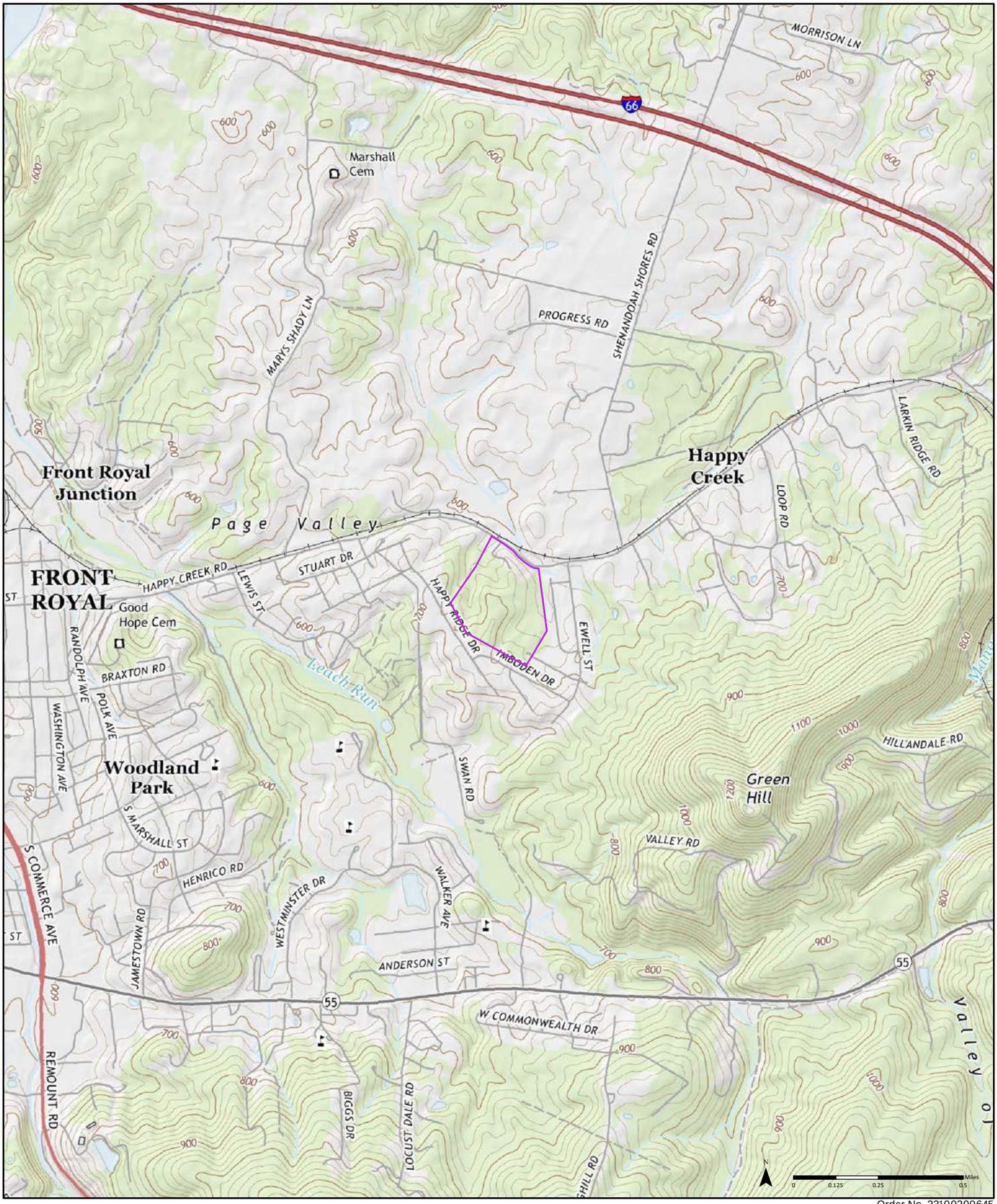
2019

Order No. 23100200645



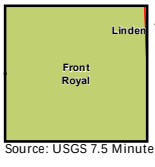
Available Quadrangle(s): Front Royal, VA

Source: USGS 7.5 Minute Topographic Map



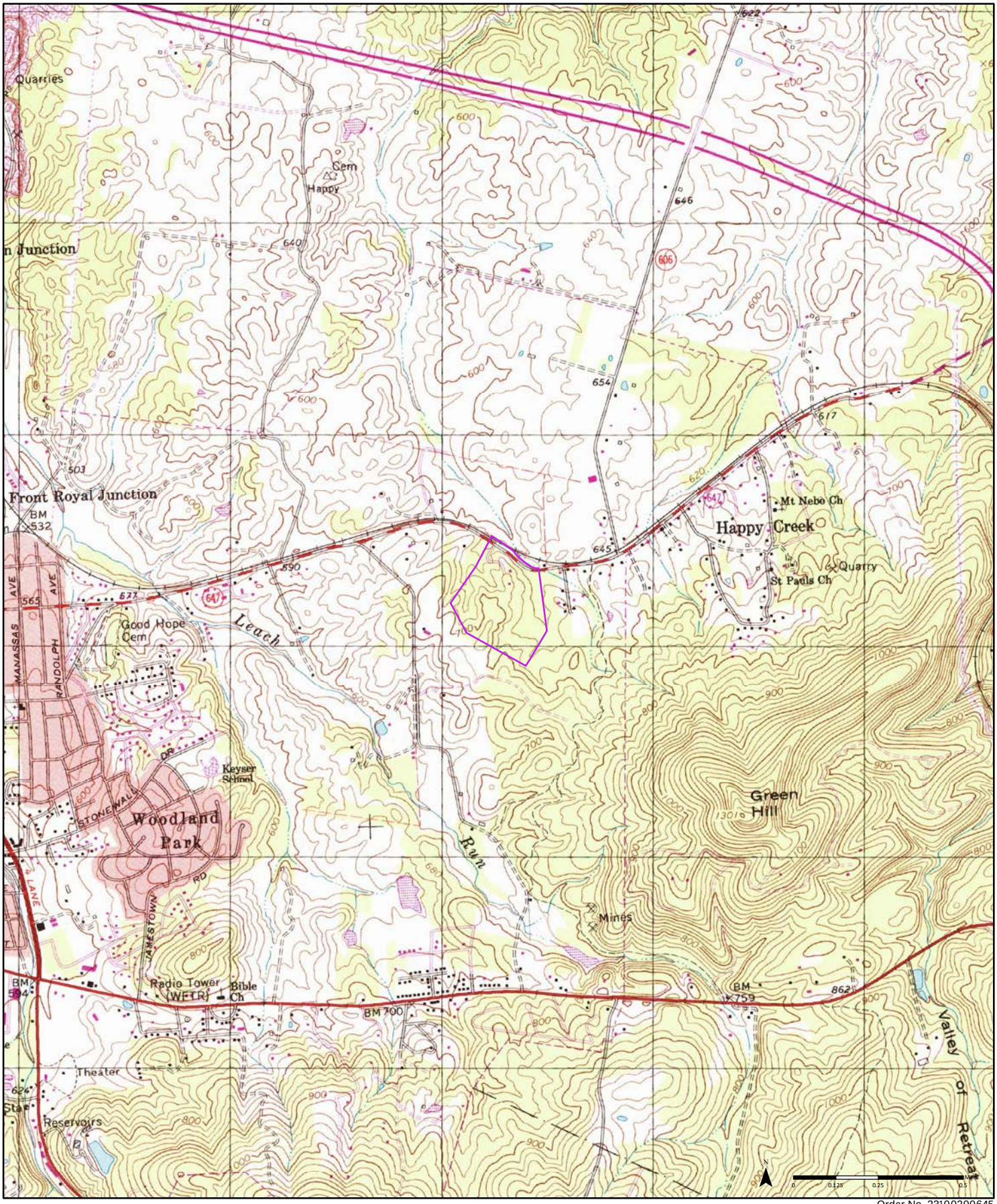
2016

Order No. 23100200645



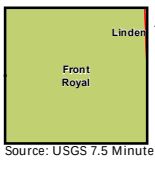
Available Quadrangle(s): Front Royal, VA

Source: USGS 7.5 Minute Topographic Map



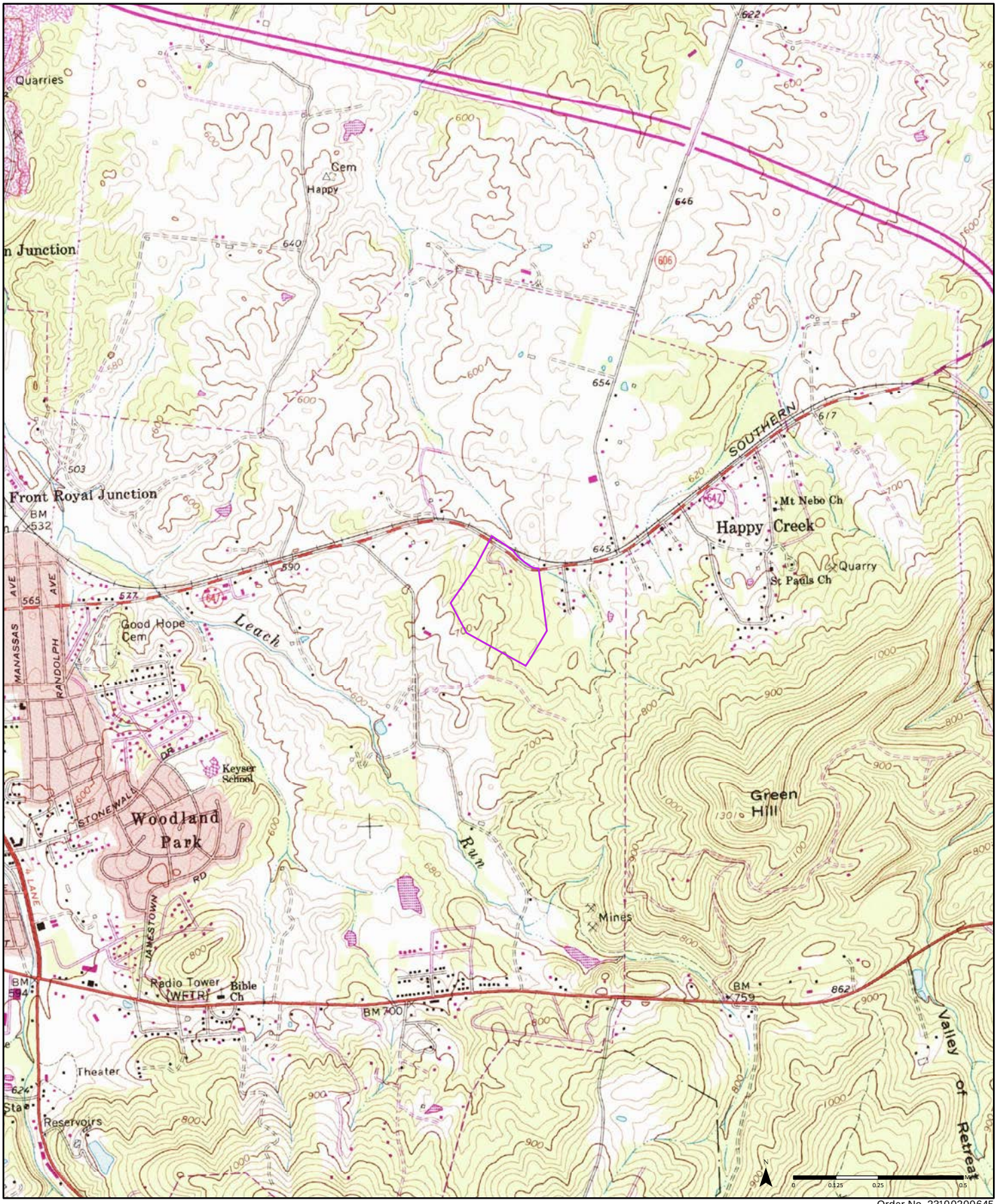
1994 (1-1994)
Aerial Photo Year: 1982

Order No. 23100200645



Available Quadrangle(s): Front Royal, VA(1-1994)

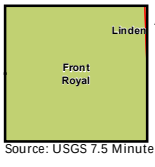
Source: USGS 7.5 Minute Topographic Map



1986

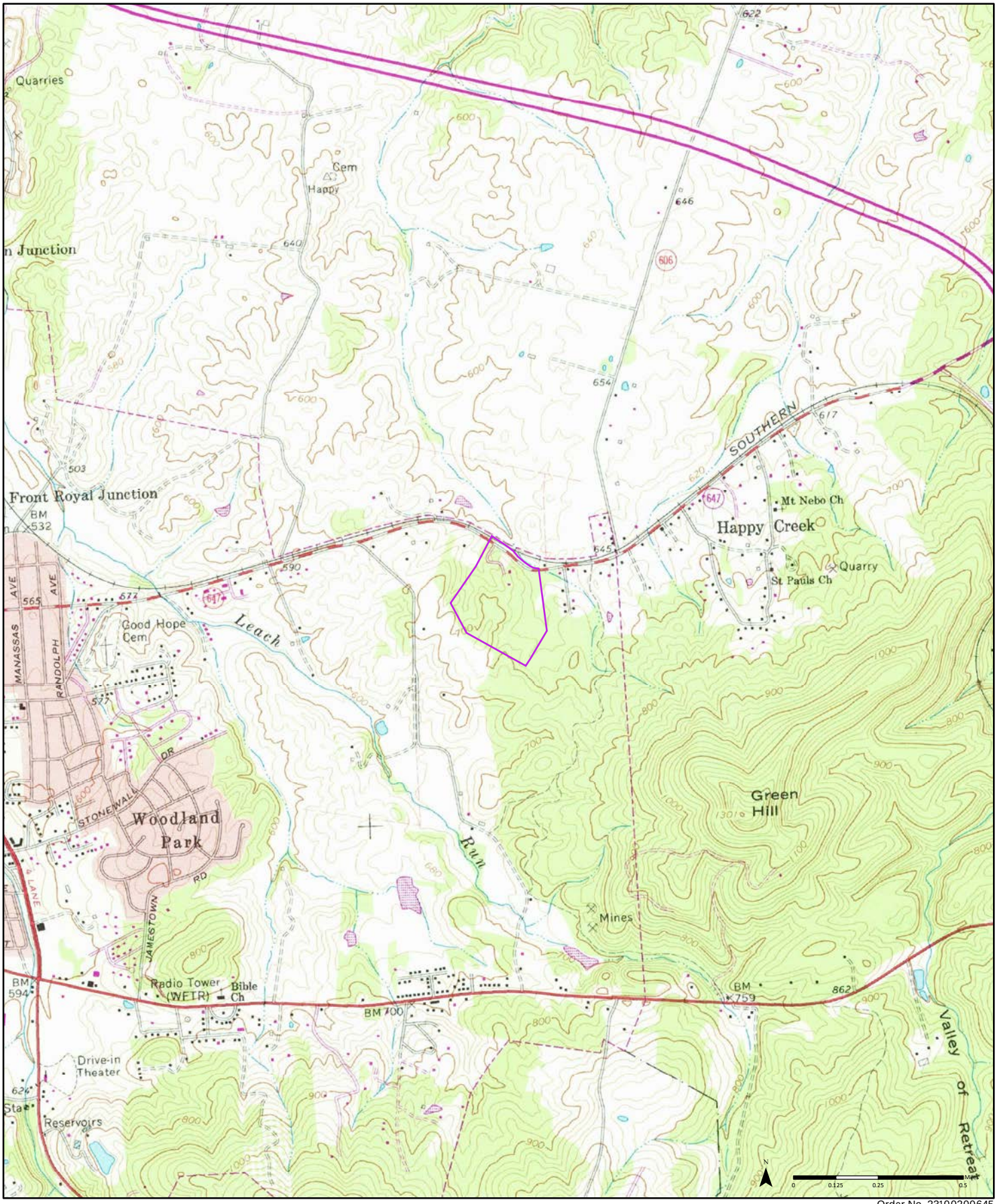
(1-1986)
Aerial Photo Year: 1982
Photo Revision Year: 1986

Order No. 23100200645



Available Quadrangle(s): Front Royal, VA(1-1986)

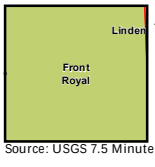
Source: USGS 7.5 Minute Topographic Map



1978

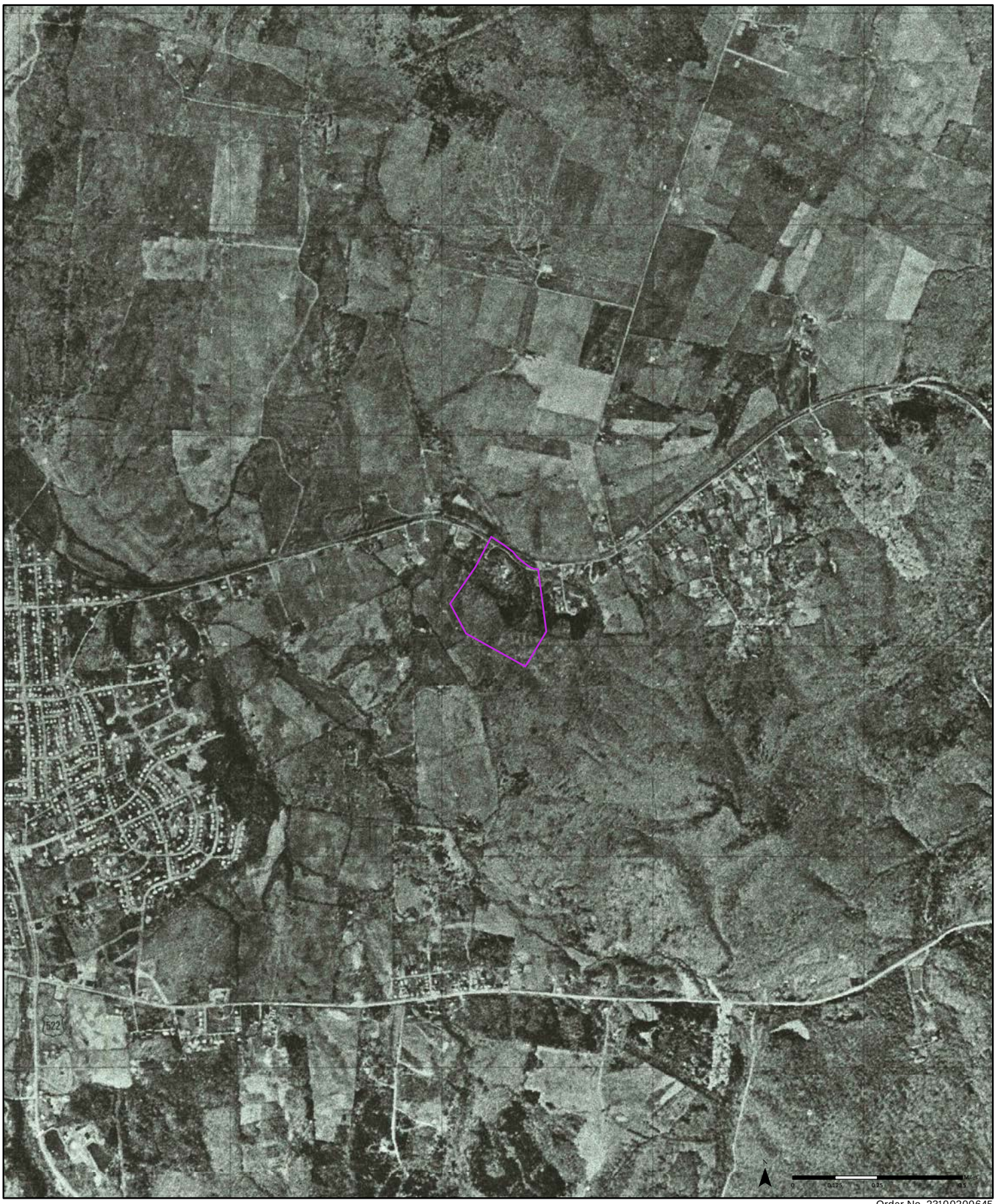
(1-1978)
Aerial Photo Year: 1977
Photo Revision Year: 1978

Order No. 23100200645



Available Quadrangle(s): Front Royal, VA(1-1978)

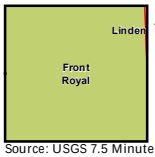
Source: USGS 7.5 Minute Topographic Map



1972

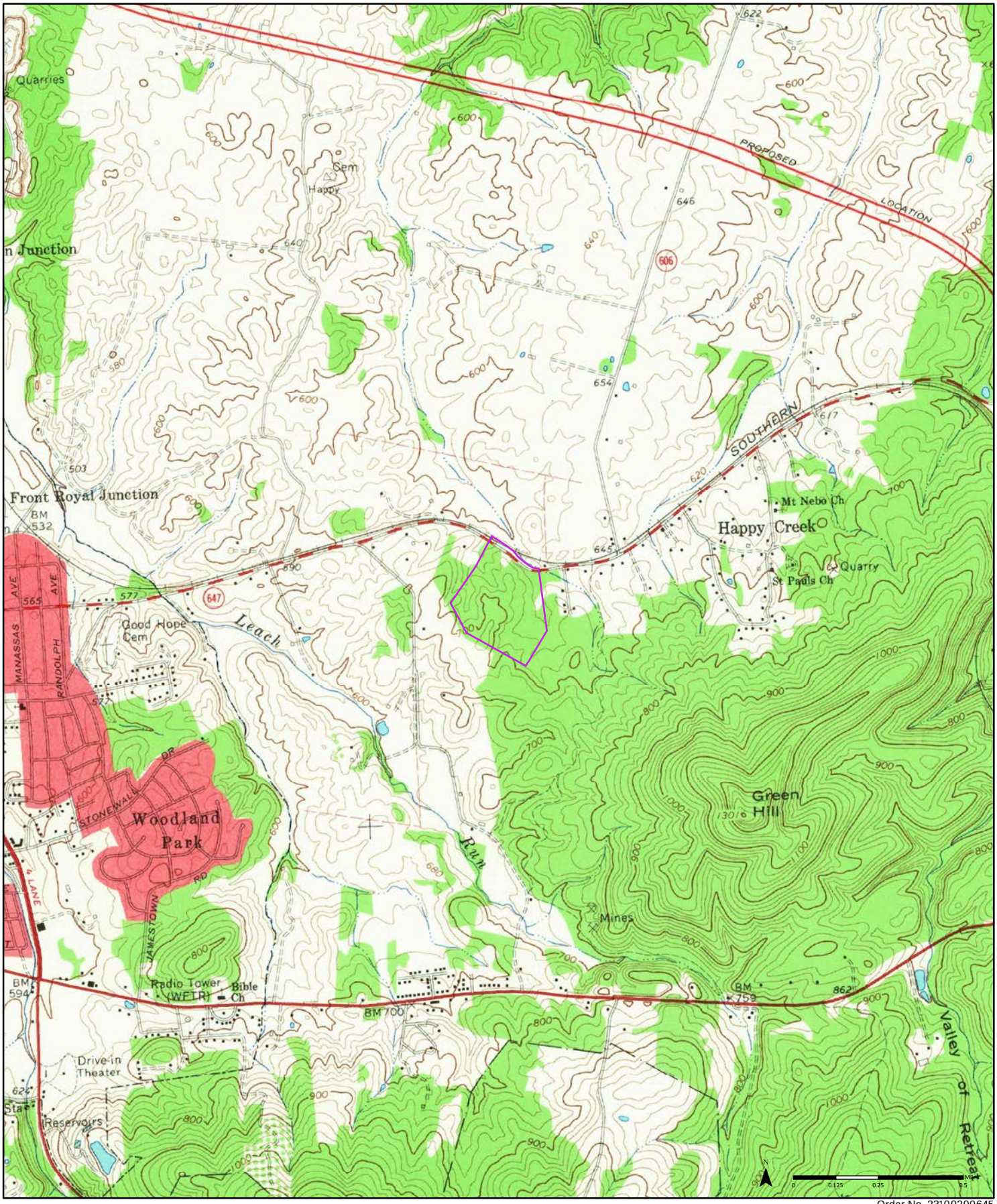
(1-1972)
Aerial Photo Year: 1972

Order No. 23100200645



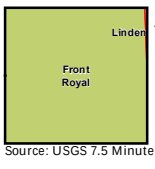
Available Quadrangle(s): Front Royal, VA(1-1972)

Source: USGS 7.5 Minute Topographic Map



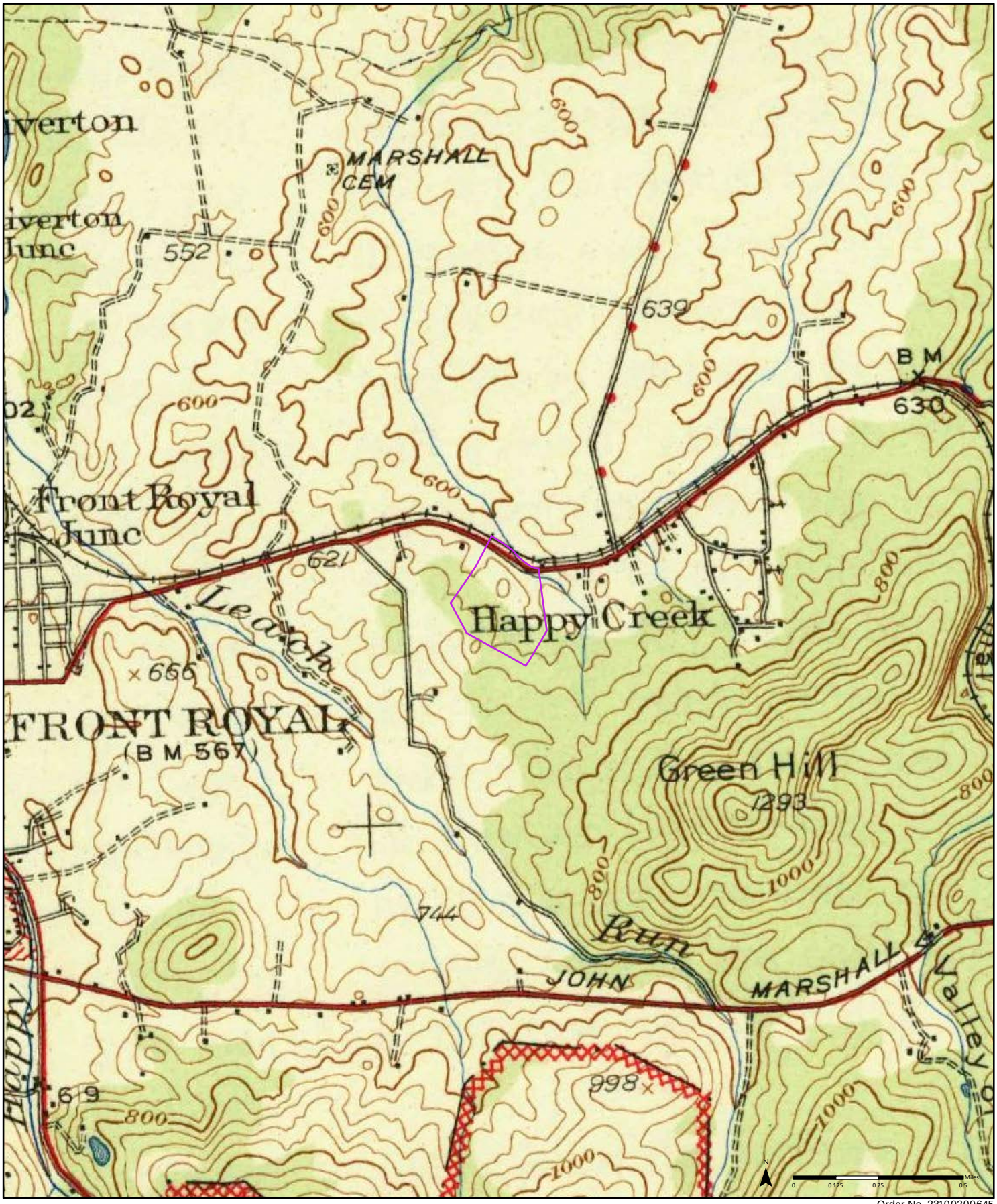
1967 (1-1967)
Aerial Photo Year: 1964

Order No. 23100200645



Available Quadrangle(s): Front Royal, VA(1-1967)

Source: USGS 7.5 Minute Topographic Map

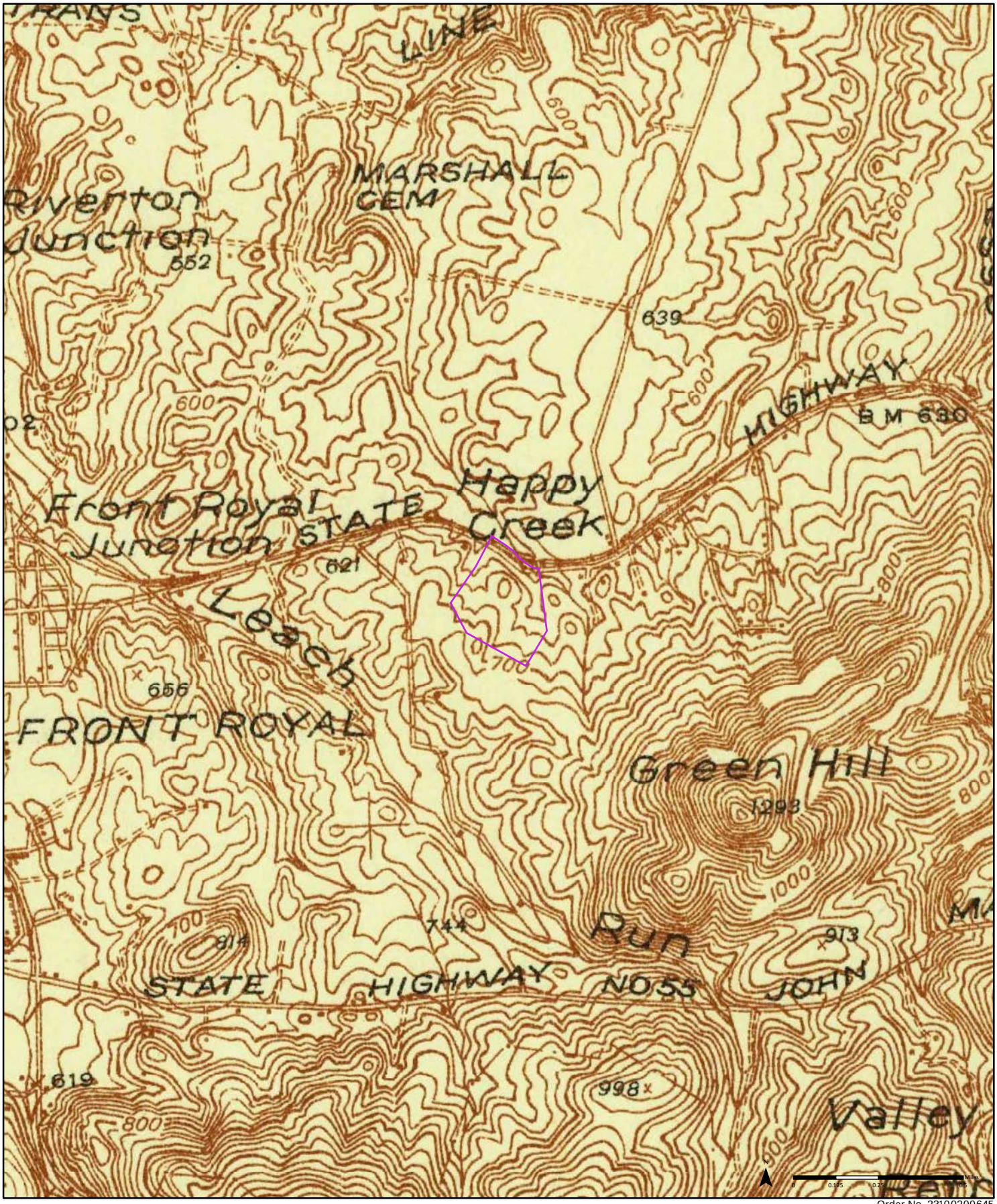


Order No. 23100200645

1944

Available Quadrangle(s): Front Royal, VA

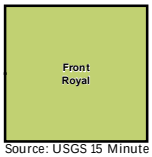
Source: USGS 15 Minute Topographic Map



1939

Order No. 23100200645

Available Quadrangle(s): Front Royal, VA



Source: USGS 15 Minute Topographic Map

CITY DIRECTORY

Project Property:	*Happy Creek Road Parcel* *1321 Happy Creek Road* *Front Royal,VA 22630*
Project No:	*47:15516-A*
Requested By:	*ECS Limited*
Order No:	*23100200645*
Date Completed:	*October 05, 2023*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

October 05, 2023
RE: CITY DIRECTORY RESEARCH
1321 Happy Creek Road
Front Royal,VA 22630

Thank you for contacting ERIS for an City Directory Search for the site described above. Our staff has conducted a reverse listing City Directory search to determine prior occupants of the subject site and adjacent properties. We have provided the nearest addresses(s) when adjacent addresses are not listed. If we have searched a range of addresses, all addresses in that range found in the Directory are included.

Note: Reverse Listing Directories generally are focused on more highly developed areas. Newly developed areas may be covered in the more recent years, but the older directories will tend to cover only the "central" parts of the city. To complete the search, we have either utilized the ACPL, Library of Congress, State Archives, and/or a regional library or history center as well as multiple digitized directories. These do not claim to be a complete collection of all reverse listing city directories produced.

ERIS has made every effort to provide accurate and complete information but shall not be held liable for missing, incomplete or inaccurate information. To complete this search we used the general range(s) below to search for relevant findings. If you believe there are additional addresses or streets that require searching please contact us at 866-517-5204.

Search Criteria:
1000-End of Happy Creek Rd
All of Happy Ridge Dr
Search Notes:

Search Results Summary

Date	Source	Comment
2022	DIGITAL BUSINESS DIRECTORY	
2020	DIGITAL BUSINESS DIRECTORY	
2016	DIGITAL BUSINESS DIRECTORY	
2012	DIGITAL BUSINESS DIRECTORY	
2008	DIGITAL BUSINESS DIRECTORY	
2003	DIGITAL BUSINESS DIRECTORY	
2000	DIGITAL BUSINESS DIRECTORY	
1996	POLKS	
1991	POLKS	
1985-86	POLKS	
1981	HILLS	
1976	HILLS	
1971	HILLS	
1967	HILLS	
1964	HILLS	
1961	HILLS	

2022 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1001 **PETER KARESKI**...*RESIDENTIAL*
1009 **MICHELLE DONIVAN**...*RESIDENTIAL*
1048 **JAMES SULLIVAN**...*RESIDENTIAL*
1174 **TIM STRIKER**...*RESIDENTIAL*
1191 **SHARON HENRY**...*RESIDENTIAL*
1321 **JAMES ODEN**...*RESIDENTIAL*
1321 **WILL ODE**...*RESIDENTIAL*
1399 **HEISLER HARDWOOD FLOORS**...*FLOOR LAYING REFINISHING & RESURFACING*
1399 **PAUL HEISLER**...*RESIDENTIAL*
1405 **JERRY MCDONALD**...*RESIDENTIAL*
1560 **DAWN JOHNSON**...*RESIDENTIAL*
1660 **TERRY BRADSHAW**...*RESIDENTIAL*
1678 **ALICIA HENRY**...*RESIDENTIAL*
1678 **HARRY WINES**...*RESIDENTIAL*
1700 **ANGELA FLOYD**...*RESIDENTIAL*
1910 **TROY FORD**...*RESIDENTIAL*
1946 **LORI MILLS**...*RESIDENTIAL*
1982 **LINDA THOMPSON**...*RESIDENTIAL*
1996 **SHERRY SOURS**...*RESIDENTIAL*
2209 **WILLIAM ATWOOD**...*RESIDENTIAL*
2215 **BARBARA ATWOOD**...*RESIDENTIAL*
2363 **WANDA VINCENT**...*RESIDENTIAL*
2386 **DAVID KING**...*RESIDENTIAL*
2741 **STANLEY EDWARDS**...*RESIDENTIAL*

2022 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

1100 **MICHAEL WATERS**...*RESIDENTIAL*
1101 **JOEY WATERS**...*RESIDENTIAL*
1102 **LISA BOBO**...*RESIDENTIAL*
1103 **ARNOLD WILLIAMS**...*RESIDENTIAL*
1104 **KENNETH JACKSON**...*RESIDENTIAL*
1107 **NICHOLAS ZIMMON**...*RESIDENTIAL*
1110 **LORETTA MILITELLO**...*RESIDENTIAL*
1112 **JOHN FUSTO**...*RESIDENTIAL*
1113 **MICHAEL ARTONE**...*RESIDENTIAL*
1116 **BRAD ADKINS**...*RESIDENTIAL*
1117 **PAUL ROSSBACH**...*RESIDENTIAL*
1118 **GEORGIA CLARK**...*RESIDENTIAL*
1121 **NATHAN FARLEY**...*RESIDENTIAL*
1122 **CHRISTOPHER FRIES**...*RESIDENTIAL*
1123 **MARY SISK**...*RESIDENTIAL*
1124 **MARK JERGE**...*RESIDENTIAL*
1127 **ROBERT RUTHERFORD**...*RESIDENTIAL*
1128 **JOHN POND III**...*RESIDENTIAL*
1129 **MICHAEL BURROW**...*RESIDENTIAL*
1132 **EUGENE PROKO**...*RESIDENTIAL*
1133 **CHERYL MASELLA**...*RESIDENTIAL*
1134 **JANET ODELL**...*RESIDENTIAL*
1135 **ANDREW ODEN**...*RESIDENTIAL*
1136 **JEREMY SWANGER**...*RESIDENTIAL*
1138 **STEPHEN PILON**...*RESIDENTIAL*
1139 **BOYD BLANKENSHIP**...*RESIDENTIAL*
1140 **TCHOKOKAM EMGOUE**...*RESIDENTIAL*
1141 **BRYAN ALLISON**...*RESIDENTIAL*
1145 **ROBERT BUSH**...*RESIDENTIAL*
1146 **FRANK MAY**...*RESIDENTIAL*
1147 **CHARLES CURRENCE**...*RESIDENTIAL*
1148 **GARY BAUDE**...*RESIDENTIAL*
1152 **JAMES DUONG**...*RESIDENTIAL*
1153 **RUBY MASSEY**...*RESIDENTIAL*
1154 **KAREN TOMLINSON**...*RESIDENTIAL*
1157 **CARMINE ARTONE**...*RESIDENTIAL*
1159 **JAMES BAUDE**...*RESIDENTIAL*
1159 **KENNETH RUSK**...*RESIDENTIAL*

2020 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1001 **CYNTHIA KARESKI**...*RESIDENTIAL*
1001 **PETER KARESKI**...*RESIDENTIAL*
1009 **MICHELLE DONIVAN**...*RESIDENTIAL*
1048 **DOROTHY SULLIVAN**...*RESIDENTIAL*
1174 **TIM STRIKER**...*RESIDENTIAL*
1191 **CHRISTY HENRY**...*RESIDENTIAL*
1321 **WILL ODE**...*RESIDENTIAL*
1399 **LISA HEISLER**...*RESIDENTIAL*
1405 **JERRY MCDONALD**...*RESIDENTIAL*
1560 **DAWN JOHNSON**...*RESIDENTIAL*
1660 **J J PAINTING**...*PAINTERS*
1660 **JOHN BRADSHAW**...*RESIDENTIAL*
1678 **ALICIA HENRY**...*RESIDENTIAL*
1700 **ANGELA FLOYD**...*RESIDENTIAL*
1910 **CAROL FORD**...*RESIDENTIAL*
1946 **LORI MILLS**...*RESIDENTIAL*
1982 **LINDA THOMPSON**...*RESIDENTIAL*
1996 **SHERRY SOURS**...*RESIDENTIAL*
2209 **AL ATWOOD**...*RESIDENTIAL*
2215 **BARBARA ATWOOD**...*RESIDENTIAL*
2363 **FRANCE VINCENT**...*RESIDENTIAL*
2386 **DAVID KING**...*RESIDENTIAL*
2741 **STANLEY EDWARDS**...*RESIDENTIAL*

2020 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

1100 **MICHAEL WATERS**...*RESIDENTIAL*
1101 **JOANNE WATERS**...*RESIDENTIAL*
1102 **LISA BOBO**...*RESIDENTIAL*
1103 **ARNOLD WILLIAMS**...*RESIDENTIAL*
1104 **KENNETH JACKSON**...*RESIDENTIAL*
1106 **PHUOC NGUYEN**...*RESIDENTIAL*
1107 **BRENDA ZIMMON**...*RESIDENTIAL*
1110 **LORETTA MILITELLO**...*RESIDENTIAL*
1112 **JOHN FUSTO**...*RESIDENTIAL*
1113 **ANTHONY ARTONE**...*RESIDENTIAL*
1117 **DAWN ROSSBACH**...*RESIDENTIAL*
1118 **GEORGIA CLARK**...*RESIDENTIAL*
1121 **NATHAN FARLEY**...*RESIDENTIAL*
1122 **CHRISTOPHER FRIES**...*RESIDENTIAL*
1123 **KESSELL SISK**...*RESIDENTIAL*
1124 **ISAAC JERGE**...*RESIDENTIAL*
1125 **REGINA HELMICK**...*RESIDENTIAL*
1126 **EVAN SCHMIDT**...*RESIDENTIAL*
1127 **BROOKE RUTHERFORD**...*RESIDENTIAL*
1128 **DANIELLE POND**...*RESIDENTIAL*
1129 **DARLENE BURROW**...*RESIDENTIAL*
1132 **CORINNA PROKO**...*RESIDENTIAL*
1133 **CHERYL MASELLA**...*RESIDENTIAL*
1134 **JANET ODELL**...*RESIDENTIAL*
1135 **ANDREW ODEN**...*RESIDENTIAL*
1136 **JEREMY SWANGER**...*RESIDENTIAL*
1137 **NICHOLAUS WHEELER**...*RESIDENTIAL*
1138 **ANTHONY PILON**...*RESIDENTIAL*
1139 **BOYD BLANKENSHIP**...*RESIDENTIAL*
1139 **JOYCE BLANKENSHIP**...*RESIDENTIAL*
1140 **TCHOKOKAM EMGOUE**...*RESIDENTIAL*
1146 **FRANK MAY**...*RESIDENTIAL*
1147 **CHARLES CURRENCE**...*RESIDENTIAL*
1148 **GARY BAUDE**...*RESIDENTIAL*
1149 **ANN LLOYD**...*RESIDENTIAL*
1152 **JAMES DUONG**...*RESIDENTIAL*
1152 **MAI DANG**...*RESIDENTIAL*
1153 **ROBERT MASSEY**...*RESIDENTIAL*
1154 **KAREN TOMLINSON**...*RESIDENTIAL*
1157 **CARMINE ARTONE**...*RESIDENTIAL*
1159 **JAMES BAUDE**...*RESIDENTIAL*
1159 **KATHY RUSK**...*RESIDENTIAL*

2016 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1001 **CYNTHIA KARESKI**...*RESIDENTIAL*
1001 **PETER KARESKI**...*RESIDENTIAL*
1009 **MICHELLE DONIVAN**...*RESIDENTIAL*
1048 **JAMES SULLIVAN**...*RESIDENTIAL*
1174 **TIM STRIKER**...*RESIDENTIAL*
1191 **CHRISTY HENRY**...*RESIDENTIAL*
1191 **SHARON HENRY**...*RESIDENTIAL*
1321 **BETTY ODEN**...*RESIDENTIAL*
1321 **JAMES ODEN**...*RESIDENTIAL*
1321 **WILL ODE**...*RESIDENTIAL*
1405 **JERRY MCDONALD**...*RESIDENTIAL*
1497 **MCMAHON, CHRIS**...*NONCLASSIFIED ESTABLISHMENTS*
1560 **DAWN JOHNSON**...*RESIDENTIAL*
1560 **WAYNE TESTERMAN**...*RESIDENTIAL*
1660 **J & J PAINTING**...*PATIO & DECK CLEANING & RESTORATION*
1660 **JOHN BRADSHAW**...*RESIDENTIAL*
1660 **TERRY BRADSHAW**...*RESIDENTIAL*
1700 **ANGELA FLOYD**...*RESIDENTIAL*
1946 **LORI MILLS**...*RESIDENTIAL*
1982 **LINDA THOMPSON**...*RESIDENTIAL*
1996 **SHERRY SOURS**...*RESIDENTIAL*
2209 **WILLIAM ATWOOD**...*RESIDENTIAL*
2215 **BARBARA ATWOOD**...*RESIDENTIAL*
2215 **DONALD ATWOOD**...*RESIDENTIAL*
2363 **FRANCE VINCENT**...*RESIDENTIAL*
2363 **WANDA VINCENT**...*RESIDENTIAL*
2386 **DAVID KING**...*RESIDENTIAL*
2741 **STANLEY EDWARDS**...*RESIDENTIAL*

2016 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

1100 **MICHAEL WATERS**...*RESIDENTIAL*
1101 **JOANNE WATERS**...*RESIDENTIAL*
1101 **JOEY WATERS**...*RESIDENTIAL*
1101 **TAYLOR WATERS**...*RESIDENTIAL*
1102 **LISA BOBO**...*RESIDENTIAL*
1104 **KENNETH JACKSON**...*RESIDENTIAL*
1104 **KIMBERLY JACKSON**...*RESIDENTIAL*
1106 **PHUOC NGUYEN**...*RESIDENTIAL*
1107 **NICHOLAS ZIMMON**...*RESIDENTIAL*
1110 **LORETTA MILITELLO**...*RESIDENTIAL*
1112 **JOHN FUSTO**...*RESIDENTIAL*
1112 **LAURA FUSTO**...*RESIDENTIAL*
1113 **ANTHONY ARTONE**...*RESIDENTIAL*
1113 **JEANNE ARTONE**...*RESIDENTIAL*
1113 **MICHAEL ARTONE**...*RESIDENTIAL*
1117 **PAUL ROSSBACH**...*RESIDENTIAL*
1118 **GEORGIA CLARK**...*RESIDENTIAL*
1121 **NATHAN FARLEY**...*RESIDENTIAL*
1122 **CHRISTOPHER FRIES**...*RESIDENTIAL*
1124 **JOSHUA JERGE**...*RESIDENTIAL*
1124 **KELLY JERGE**...*RESIDENTIAL*
1124 **MARK JERGE**...*RESIDENTIAL*
1125 **REGINA HELMICK**...*RESIDENTIAL*
1128 **DANIELLE POND**...*RESIDENTIAL*
1129 **DARLENE BURROW**...*RESIDENTIAL*
1129 **JESSICA BURROW**...*RESIDENTIAL*
1129 **MICHAEL BURROW**...*RESIDENTIAL*
1131 **ANNA COCHRAN**...*RESIDENTIAL*
1132 **CORINNA PROKO**...*RESIDENTIAL*
1132 **EUGENE PROKO**...*RESIDENTIAL*
1132 **JAKE PROKO**...*RESIDENTIAL*
1133 **CHERYL MASELLA**...*RESIDENTIAL*
1134 **JANET ODELL**...*RESIDENTIAL*
1134 **OCIE ODELL**...*RESIDENTIAL*
1134 **RACHEL ODELL**...*RESIDENTIAL*
1135 **ANDREW ODEN**...*RESIDENTIAL*
1135 **CONSTANCE ODEN**...*RESIDENTIAL*
1136 **JEREMY SWANGER**...*RESIDENTIAL*
1137 **RATCHETMAN**...*BRAKE SERVICE*
1138 **ELIZABETH PILON**...*RESIDENTIAL*
1138 **STEPHEN PILON**...*RESIDENTIAL*
1139 **BOYD BLANKENSHIP**...*RESIDENTIAL*
1139 **JIMMY BLANKENSHIP**...*RESIDENTIAL*
1139 **JOYCE BLANKENSHIP**...*RESIDENTIAL*
1140 **TCHOKOKAM EMGOUE**...*RESIDENTIAL*
1143 **KERI KELLY**...*RESIDENTIAL*
1144 **PATRICK BRYANT**...*RESIDENTIAL*
1146 **FRANK MAY**...*RESIDENTIAL*
1147 **CHARLES CURRENCE**...*RESIDENTIAL*
1148 **GARY BAUDE**...*RESIDENTIAL*
1148 **SHAUNA BAUDE**...*RESIDENTIAL*
1149 **ANN LLOYD**...*RESIDENTIAL*
1152 **JAMES DUONG**...*RESIDENTIAL*
1152 **MAI DANG**...*RESIDENTIAL*
1153 **ROBERT MASSEY**...*RESIDENTIAL*
1153 **RUBY MASSEY**...*RESIDENTIAL*
1154 **KAREN TOMLINSON**...*RESIDENTIAL*
1157 **CARMINE ARTONE**...*RESIDENTIAL*
1157 **CAROL ARTONE**...*RESIDENTIAL*
1159 **KATHY RUSK**...*RESIDENTIAL*
1159 **KENNETH RUSK**...*RESIDENTIAL*

2012 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1001 **CYNTHIA KARESKI**...*RESIDENTIAL*
1009 **JAMES DONIVAN**...*RESIDENTIAL*
1048 **DOROTHY SULLIVAN**...*RESIDENTIAL*
1048 **JAMES SULLIVAN**...*RESIDENTIAL*
1191 **SHARON HENRY**...*RESIDENTIAL*
1205 **DALE ODEN**...*RESIDENTIAL*
1205 **SHELLEY ODEN**...*RESIDENTIAL*
1399 **LISA HEISLER**...*RESIDENTIAL*
1399 **PAUL HEISLER**...*RESIDENTIAL*
1405 **J L MC DONALD SAWMILL**...*SAWMILLS (MFRS)*
1405 **JERRY MCDONALD**...*RESIDENTIAL*
1519 **EDWARD ALEXANDER**...*RESIDENTIAL*
1660 **J & J PAINTING**...*PAINTERS*
1678 **FRED MOSSER**...*RESIDENTIAL*
1700 **CHRISTOPHER NYMAN**...*RESIDENTIAL*
1700 **ERIC HUPPERT**...*RESIDENTIAL*
1700 **MAUREEN NYMAN**...*RESIDENTIAL*
1700 **MICHAEL SCROGGINS**...*RESIDENTIAL*
1700 **REI SCROGGINS**...*RESIDENTIAL*
1874 **JACQUELINE HOUGH**...*RESIDENTIAL*
1874 **PATRICIA HOUGH**...*RESIDENTIAL*
1874 **PATRICIA HOUSH**...*RESIDENTIAL*
1886 **DANIEL DODSON**...*RESIDENTIAL*
1910 **CHARLES CORNWELL**...*RESIDENTIAL*
1910 **HOLLY CORNWELL**...*RESIDENTIAL*
1946 **JOANN HOUGH**...*RESIDENTIAL*
1946 **LORI MILLS**...*RESIDENTIAL*
1982 **LINDA THOMPSON**...*RESIDENTIAL*
1996 **SHERRY SOURS**...*RESIDENTIAL*
2209 **AL ATWOOD**...*RESIDENTIAL*
2209 **KIMBERLY ATWOOD**...*RESIDENTIAL*
2209 **WILLIAM ATWOOD**...*RESIDENTIAL*
2215 **BARBARA ATWOOD**...*RESIDENTIAL*
2363 **FRANCE VINCENT**...*RESIDENTIAL*
2363 **VINCENT FRANCES**...*RESIDENTIAL*
2363 **WANDA VINCENT**...*RESIDENTIAL*
2386 **DAVID KING**...*RESIDENTIAL*
2386 **HEATHER KING**...*RESIDENTIAL*
2741 **STANLEY EDWARDS**...*RESIDENTIAL*

2012 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

90 total records. Part 1 of 2

1100 **MICHAEL WATERS**...*RESIDENTIAL*
1100 **PAMELA WATERS**...*RESIDENTIAL*
1101 **JOANNE WATERS**...*RESIDENTIAL*
1101 **TAYLOR WATERS**...*RESIDENTIAL*
1102 **LISA BOBO**...*RESIDENTIAL*
1103 **ARNOLD WILLIAMS**...*RESIDENTIAL*
1104 **KENNETH JACKSON**...*RESIDENTIAL*
1107 **BRENDA ZIMMON**...*RESIDENTIAL*
1107 **MICHAEL ZIMMON**...*RESIDENTIAL*
1108 **JYOTI VASISHTA**...*RESIDENTIAL*
1108 **VASISHTA JYOTI**...*RESIDENTIAL*
1109 **GRETCHEN VANWEGEN**...*RESIDENTIAL*
1111 **JAYABEN PATEL**...*RESIDENTIAL*
1111 **MANU PATEL**...*RESIDENTIAL*
1112 **LAURA FUSTO**...*RESIDENTIAL*
1114 **JOSHUA KACSIR**...*RESIDENTIAL*
1114 **PATRICIA KACSIR**...*RESIDENTIAL*
1116 **LARRY MILLER**...*RESIDENTIAL*
1117 **DAWN ROSSBACH**...*RESIDENTIAL*
1117 **PAUL ROSSBACH**...*RESIDENTIAL*
1117 **ROSSBACH PAUL**...*RESIDENTIAL*
1118 **ANGELICA MALLARI**...*RESIDENTIAL*
1118 **JERIC MALLARI**...*RESIDENTIAL*
1118 **JOEL MALLARI**...*RESIDENTIAL*
1118 **MALLLARI JERIC**...*RESIDENTIAL*
1118 **SARAH MALLARI**...*RESIDENTIAL*
1119 **BAYLON HARRIS**...*RESIDENTIAL*
1119 **DEBORAH DUNN**...*RESIDENTIAL*
1119 **WILLIAM DUNN**...*RESIDENTIAL*
1120 **JACQUELINE MCGINNIS**...*RESIDENTIAL*
1120 **PATRICK MCGINNIS**...*RESIDENTIAL*
1122 **CHRISTOPHER FRIES**...*RESIDENTIAL*
1122 **FRIES CHRISTOPHER**...*RESIDENTIAL*
1122 **GLORIA FRIES**...*RESIDENTIAL*
1124 **ANGELA MARLOW**...*RESIDENTIAL*
1124 **RICHARD NOVAK**...*RESIDENTIAL*
1125 **CHARLES HELMICK**...*RESIDENTIAL*
1125 **REGINA HELMICK**...*RESIDENTIAL*
1126 **PAUL SCHMIDT**...*RESIDENTIAL*
1126 **SHERRY SCHMIDT**...*RESIDENTIAL*
1127 **JILL RUTHERFORD**...*RESIDENTIAL*
1127 **ROBERT RUTHERFORD**...*RESIDENTIAL*
1128 **DANI POND**...*RESIDENTIAL*
1128 **DANIEL POND**...*RESIDENTIAL*
1128 **JOHN POND**...*RESIDENTIAL*
1129 **DARLENE BURROW**...*RESIDENTIAL*
1129 **MICHAEL BURROW**...*RESIDENTIAL*
1129 **NICOLE BURROW**...*RESIDENTIAL*
1130 **RANDY COPE**...*RESIDENTIAL*
1130 **ROBIN COPE**...*RESIDENTIAL*
1133 **CHERYL MASELLA**...*RESIDENTIAL*
1134 **DANIEL ODELL**...*RESIDENTIAL*
1134 **JANET ODELL**...*RESIDENTIAL*
1135 **CONSTANCE ODEN**...*RESIDENTIAL*
1136 **JEREMY SWANGER**...*RESIDENTIAL*
1136 **STEPHANIE SWANGER**...*RESIDENTIAL*
1136 **SWANGER JEREMY**...*RESIDENTIAL*
1137 **MIKULAK GLENDA**...*RESIDENTIAL*
1137 **ROBERT MIKULAK**...*RESIDENTIAL*
1138 **ELIZABETH PILON**...*RESIDENTIAL*
1138 **STEPHEN PILON**...*RESIDENTIAL*
1139 **BOYD BLANKENSHIP**...*RESIDENTIAL*
1139 **JIMMY BLANKENSHIP**...*RESIDENTIAL*
1139 **LIZ BLANKENSHIP**...*RESIDENTIAL*
1140 **JOHANE KAMAHA**...*RESIDENTIAL*
1140 **TCHOKOKA EMGOUE**...*RESIDENTIAL*
1140 **TCHOKOKAM EMGOUE**...*RESIDENTIAL*
1141 **KIMBERLY VANDERGRIFT**...*RESIDENTIAL*
1142 **JOSEPH WALTZ**...*RESIDENTIAL*

2012 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

Part 2 of 2

1142 **MONICA WALTZ**...*RESIDENTIAL*
1142 **OPAL WALTZ**...*RESIDENTIAL*
1143 **FISCHBACH BRIAN**...*RESIDENTIAL*
1143 **SOPHIE FISCHBACH**...*RESIDENTIAL*
1149 **RALPH DULANEY**...*RESIDENTIAL*
1150 **JAMES ARRINGTON**...*RESIDENTIAL*
1151 **DAN NAGLEY**...*RESIDENTIAL*
1151 **LISA NAGLEY**...*RESIDENTIAL*
1151 **NAGLEY DANIEL**...*RESIDENTIAL*
1152 **DUONG JAMES**...*RESIDENTIAL*
1152 **JAMES DUONG**...*RESIDENTIAL*
1153 **MASSEY RUBY**...*RESIDENTIAL*
1153 **RUBY MASSEY**...*RESIDENTIAL*
1154 **ALISSA GARCIA**...*RESIDENTIAL*
1154 **AUDREY GARCIA**...*RESIDENTIAL*
1154 **CARLOS GARCIA**...*RESIDENTIAL*
1155 **CHRISTOPHER PRICE**...*RESIDENTIAL*
1157 **CARMINE ARTONE**...*RESIDENTIAL*
1157 **CAROL ARTONE**...*RESIDENTIAL*
1159 **KENNETH RUSK**...*RESIDENTIAL*
1161 **RONALD OCCHIOGROSSO**...*RESIDENTIAL*

2008 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1001 **PETER L KARESKI**...*RESIDENTIAL*
1009 **JAMES & MICHELLE DONIVAN**...*RESIDENTIAL*
1048 **JAMES & DOROTHY SULLIVAN**...*RESIDENTIAL*
1171 **RAY T ODEN**...*RESIDENTIAL*
1191 **MARY L ODEN**...*RESIDENTIAL*
1191 **RUTH E MCDONALD**...*RESIDENTIAL*
1405 **J L MC DONALD SAWMILL**...*SAWMILLS, PLG MILLS*
1405 **J L MCDONALD**...*RESIDENTIAL*
1433 **TERESA SHARP**...*RESIDENTIAL*
1497 **ALEXANDER & LURLEANE W CROWERS**...*RESIDENTIAL*
1497 **CHRIS MCMAHON**...*RESIDENTIAL CONSTRUCTION*
1519 **E W JR ALEXANDER**...*RESIDENTIAL*
1652 **HAPPY CREEK UNITED METHODIST**...*CHURCHES*
1652 **HAPPY CREEK UNITED METHODIST**...*METHODIST CHURCH*
1652 **HAPPY CREEK UNTD MTHDST CHURCH**...*RELIGIOUS ORGANIZATION*
1656 **H KAHRS**...*RESIDENTIAL*
1656 **HINRICH KAHRS**...*RESIDENTIAL*
1660 **J & J PAINTING**...*PTG, PPR HANG CONTR*
1660 **J & J PAINTING**...*PAINTERS*
1660 **J J PAINTING**...*PAINTING/PAPER HANGING CONTRACTOR*
1660 **JOHN BRADSHAW**...*RESIDENTIAL*
1678 **FRED MOSSER**...*RESIDENTIAL*
1764 **H L STROTHER**...*RESIDENTIAL*
1874 **WILLIAM R HOUGH**...*RESIDENTIAL*
1886 **DANIEL DODSON**...*RESIDENTIAL*
1910 **LORI MILLS**...*RESIDENTIAL*
1946 **WILLIAM & JOANN R JR HOUGH**...*RESIDENTIAL*
1982 **LINDA THOMPSON**...*RESIDENTIAL*
2209 **AL & KIM ATWOOD**...*RESIDENTIAL*
2209 **BOBBY CAMPBELL PAPER HANG**...*PAINTING/PAPER HANGING CONTRACTOR*
2210 **CHARLES BALTIMORE**...*RESIDENTIAL*
2215 **DONALD ATWOOD**...*RESIDENTIAL*
2363 **FRANCE E VINCENT**...*RESIDENTIAL*
2363 **W L VINCENT**...*RESIDENTIAL*
2386 **HEATHER & DAVID SANDERS**...*RESIDENTIAL*
2741 **STANLEY & WANDA EDWARDS**...*RESIDENTIAL*

2008 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

1104 **K JACK SERVICES**...*CARPET/UPHOLSTERY CLEANING*
1121 **HAYES HEATING AIR & COND**...*PLUMBING/HEATING/AIR COND CONTRACTOR*

2003 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1048 **JAMES SULLIVAN**...*RESIDENTIAL*
1171 **RAY T ODEN**...*RESIDENTIAL*
1425 **KENNY CANTRELL**...*RESIDENTIAL*
1433 **L F WEISEL**...*RESIDENTIAL*
1652 **HAPPY CREEK UNITED METHODIST**

2003 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2000 HAPPY CREEK RD

SOURCE: DIGITAL BUSINESS DIRECTORY

1048 **JAMES SULLIVAN**...*RESIDENTIAL*
1171 **RAY T ODEN**...*RESIDENTIAL*
1405 **J L MC DONALD SAWMILL**...*SAWDUST, SHAVINGS, AND WOOD CHIPS*
1425 **KENNY CANTRELL**...*RESIDENTIAL*
1433 **L F WEISEL**...*RESIDENTIAL*
1652 **HAPPY CREEK UNITED METHODIST**

2000 HAPPY RIDGE DR

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

1996 HAPPY CREEK RD-A

SOURCE: POLKS

993-410 Not Verified (4 Hses)
+ ***MEADOW LA INTERSECTS***
1001 Not Verified
1048 Sullivan James A & Dorothy [7] ♠ 635-4895
+ ***WAKELAND CT INTERSECTS***
+ ***SWAN RD INTERSECTS***
1066 Not Verified

18

1201 Oden Ray T ♠ 636-6772
1174 Morrison R Alton [8]+ ♠ 635-4287

1996 HAPPY CREEK RD-B

SOURCE: POLKS

HAPPY CREEK RD *cont'd*

1201 Oden Mary L ♠ 635-9701
1247 Beatly William I
Beatty William I & Mary [9]+ ♠
..... 635-4524
+ ***LINDEN DR INTERSECTS***
1405 Mc Donald Jerry L & Margaret [3]
♠ 635-5124
1433 Weisel Lawrence & Reba [4]
..... 635-1464
1497 Strother Loney F [9]+ ♠ 635-2032
1519 Alexander E W Jr & Kathleen [9]+
♠ 635-5591
1425 Hurst Johnnie E [4] ♠.... 635-9794
1531 Harrell P W [3] ♠..... 635-2061
1559 Kidwell James & Donna [4]
..... 636-7902
1560 Thomas Horace L [6] ♠. 635-3757
+ ***SHENANDOAH SHORES RD INTERSECTS***
+ ***TOWN LIMITS***
HAPPY CREEK UNITED
METHODIST CHURCH
BUSINESSES 3 HOUSEHOLDS 66

HARRIS DR (SHENANDOAH RIVER ESTATES)-FROM BEACH RD

1996 HAPPY RIDGE DR

SOURCE: POLKS

STREET NOT LISTED

985 Kirkland Joel T ◎ 635-3283
MEADOW LA BEGINS
1048 Sullivan James A ◎
635-4895
WAKELAND CT BEGINS
SWAN RD BEGINS
1066-1171 Vacant (2 Hses)
1174 Morrison R Alton ◎
635-4287
1191 Oden Mary L Mrs ◎
636-6772
1252 Kidwell James M ◎
635-2962
1247 Beatty Wm I ◎ 635-4524
1321 Vacant
LINDEN DR BEGINS
1405-1433 Vacant (2 Hses)
1497 Strother Judy V Mrs ◎
1519 Alexander Kathleen D Mrs
◎ 635-5591
1425 Cantrell Kenny W 636-3602
606 Harrell Preston W ◎
635-2061
1559 No Return
1560 Thomas Horace L ◎
635-3757
SHENANDOAH SHORES RD
BEGINS
TOWN LIMITS

HAPPY CREEK RD RT 3
–Contd

Happy Creek United
Methodist Church church
635-8466

bx184 Vacant

18

HARRIS DR (SHENANDOAH RIVER ESTATES)–FROM HAPPY CREEK NORTHWEST

1991 HAPPY RIDGE DR

SOURCE: POLKS

STREET NOT LISTED

1985-86 HAPPY CREEK RD-A

SOURCE: POLKS

985 Kirkland Joel T ◎ 635-3283

SWAN RD

1048★Maddox

1066 Dennison James P ◎

635-2266

1171 Wolfe Jos K 635-7909

HAPPY CREEK RD RT 3
—Contd
1174 Morrison R Alton ◎
635-4287
1191 Oden Ray T ◎ 636-6772
BOX NUMBERS
bx42 Kidwell James M ◎
635-2962
1247 Beatty Wm I ◎ 635-4524
1321 Sheaffer Robt C 635-5263
LINDEN DR BEGINS
bx1425 Smelser Roger ◎
1045 Mc Donald Jerry L lbr dlr
◎ 635-5138
1425★Wiggins James 636-3551
1443 Frame Dorothy B Mrs ◎
636-6046
1497 Strother Willie W ◎
1519 Alexander Edw W Jr ◎
635-5591
1531 Harrell Preston W ◎
635-2061
1559 Smith Wm H Jr 635-8962
1587 Thomas Horrace L ◎
635-3757
SHENANDOAH SHORES RD
BEGINS
TOWN LIMITS
Happy Creek United
Methodist Church
bx184 Alexander Wm C ◎
635-5318

HARRIS ST RT 5
(SHENANDOAH RIVER
ESTATES)—FROM HAPPY
CREEK NORTHWEST

STREET NOT LISTED

Report ID: 23100200645 - 10/05/2023
www.erisinfo.com

910 Heflin Paul ◎ 636-9347
BOX NUMBERS
bx8 Almarode Raymond D Jr ◎
635-3851
bx18 Hudson Basil C Jr ◎
636-6364
bx21 Alexander Mafie M ◎
635-4773
bx22 Vaught Haywood L ◎
636-6345
bx23 Von Ludwig David Lee ◎
636-9584
Mc Intosh Elmer D Jr ◎
635-5624
Riley Walter R Jr ◎
636-9636
bx34 Kirkland Joe T ◎ 635-3283
bx41 Oden Ray T ◎ 636-6772
Morrison R Alton ◎
635-4287
bx42 Kidwell James M ◎
635-2962
bx43 Beatty Wm I ◎ 635-4524
LINDEN DR BEGINS
bx50 Smelser Roger 636-6341
bx52 Jenning Noah B ◎ 636-9678
bx54 Strother Wm W
bx55 Alexander Edw W Jr
635-5591
★Harrell Preston W 635-2061
SHENANDOAH SHORES RD
BEGINS
TOWN LIMITS
Happy Creek United
Methodist Ch

bx184 Alexander Wm C ◎
635-5318

14

HENRICO RD —FROM
GLOCESTER RD NORTH 1
EAST OF JAMESTOWN RD

1981 HAPPY RIDGE DR

SOURCE: HILLS

STREET NOT LISTED

1976 HAPPY CREEK RD

SOURCE: HILLS

RANGE NOT LISTED

1976 HAPPY RIDGE DR

SOURCE: HILLS

STREET NOT LISTED

1971 HAPPY CREEK RD

SOURCE: HILLS

RANGE NOT LISTED

1971 HAPPY RIDGE DR

SOURCE: HILLS

STREET NOT LISTED

1967 HAPPY CREEK RD

SOURCE: HILLS

RANGE NOT LISTED

1967 HAPPY RIDGE DR

SOURCE: HILLS

STREET NOT LISTED

1964 HAPPY CREEK RD

SOURCE: HILLS

RANGE NOT LISTED

1964 HAPPY RIDGE DR

SOURCE: HILLS

STREET NOT LISTED

1961 HAPPY CREEK RD

SOURCE: HILLS

RANGE NOT LISTED

1961 HAPPY RIDGE DR

SOURCE: HILLS

STREET NOT LISTED

Appendix V: Site Photographs

1 - Northern exterior of the residence

2 - Eastern exterior of the residence

3 - Southern exterior of the residence

4 - Southern exterior of the residence

5 - Western exterior of the residence

6 - Patio

7 - Shed

8 - Driveway entrance

9 - Driveway

10 - Decorative pond

11 - Fire pit

12 - Water main sign

13 - Fire hydrant and water main access point

14 - Pole-mounted transformer

15 - Overhead power lines

16 - Discarded drum

17 - Dry intermittent stream bed

18 - Exterior grassy area

19 - Exterior grassy area

20 - Exterior wooded area

21 - Exterior wooded area

22 - Exterior wooded area

23 - Living room

24 - TV room

25 - Sitting room

26 - Dinning room

27 - Kitchen

28 - Mud room

29 - Bedroom

30 - Restroom

31 - Basement

32 - Basement laundry

33 - Basement storage

34 - Garage with de minimis staining

35 - Shed interior

36 - Shed interior

37 - Adjoining property to the north

38 - Adjoining property to the east

39 - Adjoining property to the south

40 - Adjoining property to the west

Appendix VI: Additional Documents

1321 HAPPY CREEK RD

Property Details

Current Owner

Name: IND DEV AUTH TOWN OF FRONT ROYAL

Mailing Address: 400 KENDRICK LN STE D N/A
FRONT ROYAL, VA 22630

Physical Address: 1321 HAPPY CREEK RD
FRONT ROYAL, VA 22630

Tax Map #: 20A212 4

Account #: 9533

Total Acres (Includes all Sublots): 41.109

Zoning: R-S

Occupancy Code: Dwelling

Magisterial Code: Happy Creek-Town

Land Use: Exempt - Multiple Government

School Zone: LFK Elem., WC Middle, WC High

Legal Repository

Legal Description: RESIDUE JAMES W ODEN PROP

Legal Description 2: SUBDIV LR03-10814

Legal Description 3: N/A

Legal Description 4: N/A

Instrument Type and Year: LR 2021

Instrument Number: 8884

Slide Number: 200

Slide Index: M

Deed Book No: N/A

Deed Book Page: 0

Will Book No: N/A

Will Book Page: 0

Valuation & Sales

Land	Improvements	Total Value
$791,000	$337,400	$1,128,400

Grantor	Sale Price	Sale Date
MOVEON8 LLC	N/A	10/13/2021

Number of Parcels Involved in Sale

1

Building

Year Built: 1969
Story Height: N/A
Number of Rooms: 8
Number of Bedrooms: 4
Full Bathrooms: 2
Half Bathrooms: 1
Basement: N/A
Finished Basement SQ FT: N/A
Garage Capacity: 3
Garage Type: Brick

Foundation Type: Brick
Water: Public
Sewer: Public
Heating: Heat Pump
Air Conditioning: Y
Fuel Type: Electric
Floor Type: Wood
Exterior Wall Type: Brick
Interior Wall Type: Drywall
Roof Type: Gable
Roof Material: Comp. Shingle-Asph

Appendix VII: Statement of Qualifications

ECS Group of Companies

Statement of Qualifications

2023

CONSTRUCTION MATERIALS

FACILITIES

GEOTECHNICAL

ENVIRONMENTAL

COMPANY OVERVIEW

"What I like most about ECS are the people. They are experts with a wide-range of knowledge. I never hesitate using ECS on projects."

- Crystal Morphis, Founder and CEO
Creative Economic Development Consulting, LLC

2,200
employees

80+
locations

30+
years' experience

ABOUT OUR COMPANY

Engineering Consulting Services (ECS) is one of the largest and most rapidly growing engineering and consulting companies in the US. Founded in 1988, ECS is a leader in geotechnical, environmental, construction materials and facilities engineering. We are currently ranked 64 in *Engineering News-Record's* Top 500 Design Firms (April 2022) and 38 in Zweig Group's 2022 Hot Firms.

ECS CORE SERVICES

- Geotechnical
- Construction Materials

ECS FOOTPRINT

Whether your project requires local project management, specialty expertise or both, we have you covered. ECS provides the best of both worlds - the attention your projects deserve from our local team, coupled with abundant staffing and technical resources. With 2,200 employees, ECS has grown to more than 80 locations spread across the Mid-Atlantic, Midwest, Southeast and Southwest.

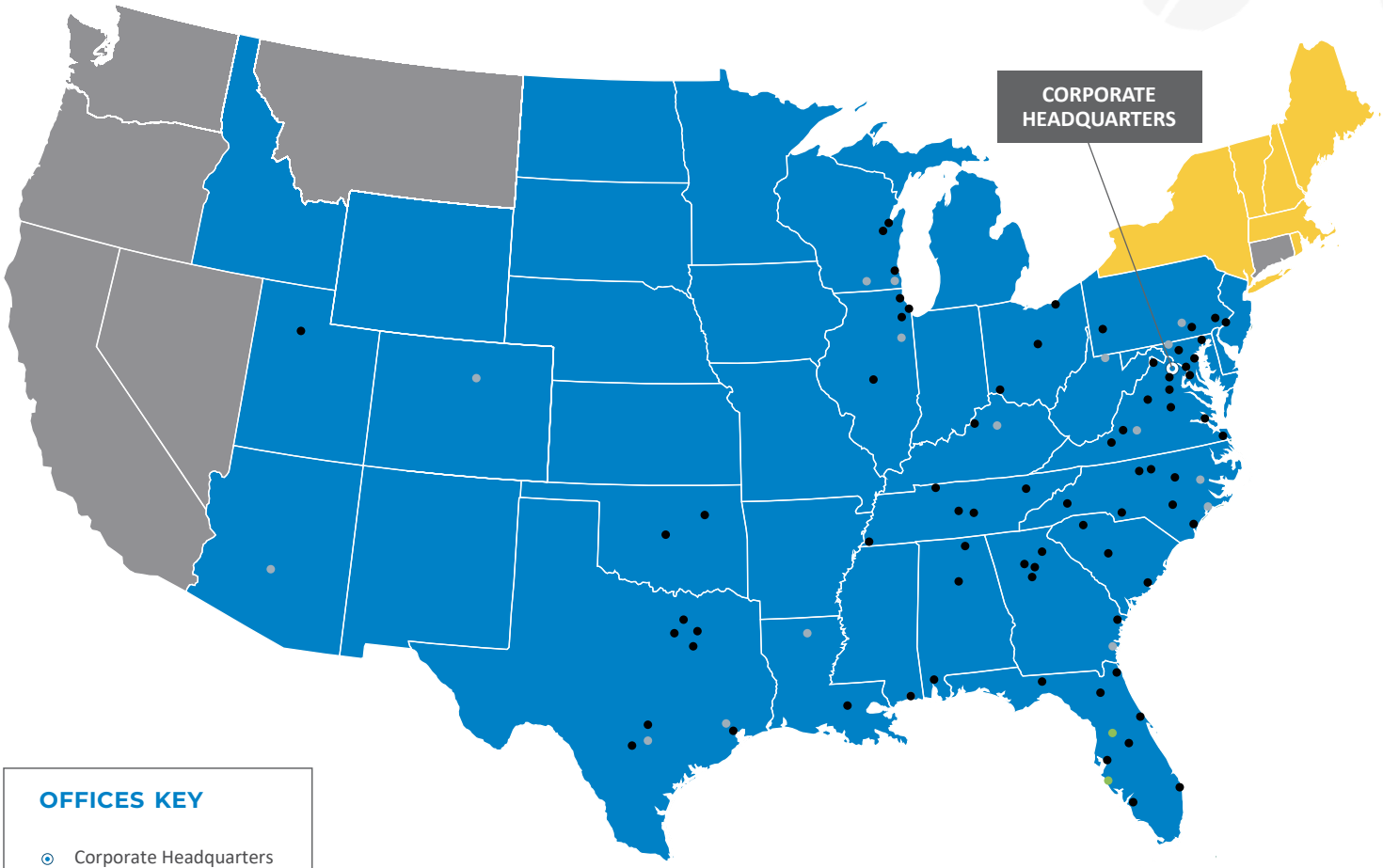
WHY ECS? WE HAVE GRIT.

What does that mean for you? That one descriptive word defines our company culture. It sets just the right tone for what our clients can expect our team to deliver each and every day. At ECS, GRIT is made up of four characteristics: guts, resilience, initiative and tenacity. Our boots are made for working. Click here for an inside look at what we do, who we are and why we have GRIT.

As a culture of doers, we roll up our sleeves and use our skills to help solve problems. We hustle.

WHEREVER YOUR PROJECT TAKES YOU, ECS HAS...

BOOTS ON THE GROUND



OFFICES KEY

- Corporate Headquarters
- Full Service Office
- Testing Services Office
- Drilling Services Office

SERVICES KEY

Materials Testing Service Area is approximately a 75-mile radius around each office.

- Environmental and Facilities
- Geotechnical, Environmental, Materials Testing, and Facilities
- Geotechnical, Environmental, and Facilities

DUE DILIGENCE

As part of typical commercial, industrial and residential real estate transactions, many services need to be completed prior to closing that should not be overlooked. ECS provides environmental and engineering due diligence services common to real estate transaction-driven work, including:

Environmental Due Diligence Services:

- Phase I Environmental Site Assessments (ESAs)
- Wetland and Stream Determination and Delineation Services
- Phase II Environmental Site Assessments (ESAs)
- Underground Storage Tank (UST) Assessments and Closures
- Environmental Transaction Screens (ETS)
- Regulatory Record Reviews
- HUD Assessments
- Endangered Species Assessments
- Historical and Cultural Surveys/Assessments
- Radon Assessment
- Asbestos Surveys and Abatement Design
- Lead-Based Paint Surveys and Abatement Design
- Microbial and Indoor Air Quality Assessments
- Vapor Intrusion Assessments
- Fannie Mae and Freddie Mac Assessments
- Contaminated soil management plans

Facilities Due Diligence Services:

- Accessibility Consulting
- Bank Draw Review
- Pre and Post Construction Surveys
- Property Condition Assessments (PCAs)
- Forensic Investigations
- GPR Surveys
- EIFS Services

Engineering Due Diligence Services:

- Subsurface Geotechnical Explorations
- Test Pit Evaluations
- Seismic Studies
- Cost estimating for construction
- Geologic Assessments

CHRISTOPHER ELLIOTT

ENVIRONMENTAL PRINCIPAL

CERTIFICATIONS

Certified Hazardous Materials Manager (CHMM)

OSHA 40 Hour Hazardous Waste Operations Training Certification (HAZWOPER)

8-Hour Hazardous Waste and Emergency Response Refresher

OSHA Outreach 30 Hour Training Course – Construction Safety and Health Construction Quality Management for Contractors

SKILLS

Environmental Services

Due Diligence Specialist

Phase I, II and III Assessments

Corrective Action Plans

Contaminated Soil Excavation

Project Design and Monitoring

Health and Safety Plan Preparation

EDUCATION

Bachelor of Science, 1998, Environmental Studies with Geology Minor, George Washington University, Washington, DC

YEARS OF EXPERIENCE

ECS: 20 Other: 4

PROFESSIONAL PROFILE

Mr. Elliott has more than 20 years of experience in various environmental consulting roles. As Environmental Principal, he is responsible for coordination, preparation and review of Phase I and Phase II Environmental Site Assessments, soil and groundwater sampling, site characterization and risk assessment. He is tasked with performing environmental investigations at sites impacted by petroleum hydrocarbons, dry cleaners, historic landfills, industrial properties and rail yards. Mr. Elliott has guided several properties through the Virginia Department of Environmental Quality (VDEQ) Voluntary Remediation Program (VRP).

PROJECT EXPERIENCE

- Beckerts Park Excavation Monitoring, Washington, DC
- 57 N Street Excavation Support Services, Washington, DC
- Columbia Pike Village Center Excavation Support, Arlington, VA
- Potomac Yard Parcel A1 Excavation Support, Alexandria, VA
- Berlin Properties Portfolio Environmental Services, Washington, DC
- Springfield Metro Center II - Environmental Support, Springfield, VA
- Watermark Condominium Excavation Support, Alexandria, VA
- 14th and G Streets - VRAP, Washington, DC
- Potomac Yards NIB Excavation Support, Alexandria, VA
- Potomac Yards Landbay H Multifamily, Alexandria, VA
- 650 H Street Excavation Support Services, Washington, DC
- 1000 S Capitol Street Groundwater Characterization, Washington, DC
- Hyatt Centric King Street Hotel - Env. Excv. Monitoring, Alexandria, VA
- Westwood Center VRP Administration, Vienna, VA
- Capper Square 769 North, Washington, DC
- Founders 2.0 Phase II ESA, Falls Church, VA
- MOB at National Harbor Excavation Monitoring, Oxon Hill, MD
- Capitol Hill Safeway Phase II, Washington, DC
- Barry Farm Recreation Center SCR, Washington, DC
- NCE Parking Lot Soil Sampling, Fort Belvoir, VA
- Neal Garden Apartments – UST Removal, Washington, DC
- Potomac Yards Landbay I Soil Sampling, Alexandria, VA
- Columbia Pike Village Center VRP Administration, Arlington, VA
- Brookland Apartments UST Removal, Washington, DC
- 72 Florida Ave Excavation Monitoring, Washington, DC
- Harry Thomas Way NE Phase II, Washington, DC

Allison Popp

Environmental Scientist

Education

Bachelor of Science in Geology, Minor in Geography
West Virginia University, 2021

Experience

ECS: One year and five months
Prior to ECS: Six months

Certifications

West Virginia Asbestos Inspector (#AI010942)
West Virginia Asbestos Air Clearance Monitor (#AA002881)
NIOSH 582 Equivalency Course
OSHA 40 Hour Hazardous Waste Operations Training Certification (HAZWOPER)

Professional Profile

Ms. Popp serves as an Environmental Scientist in the Morgantown, West Virginia office.

Ms. Popp has six months of field experience mudlogging in northern West Virginia and regions of southwestern and northern Pennsylvania. Her field geologist experience includes the collection and analysis of drill cuttings for horizontal and lateral natural gas wells, gas monitoring, and producing drilling logs.

As an Environmental Scientist, Ms. Popp is responsible for the preparation of Phase I Environmental Site Assessments. She is tasked with performing environmental investigations at sites impacted by petroleum hydrocarbons, chlorinated solvents from dry cleaners, historic landfills, industrial properties, and rail yards, including sites enrolled in the Virginia Department of Environmental Quality (VDEQ) Voluntary Remediation Program (VRP). Ms. Popp also assists with asbestos building surveys, as well as the collection of soil and groundwater samples and the creation of soil boring logs for Phase II Environmental Site Assessments.

Project Experience

Ms. Popp has experience writing Phase I Environmental Site Assessments for properties in Virginia, West Virginia, Maryland, Texas, and the District of Columbia.

She has experience working on the following projects:

- American Legion Post 139 Phase I ESA, Arlington, VA
- Beckert's Park Phase I ESA, Washington, DC
- Former Hanson Concrete Phase I ESA, Manassas, VA
- Fair Oaks JC Penney Phase I ESA, Fairfax, VA
- Fairfax Boulevard Wawa Phase I ESA, Fairfax, Virginia
- Georgia Avenue Auto Center Phase I ESA, Silver Spring, MD
- Holden Farm Phase I ESA, Shenandoah Junction, WV
- Mark Center Phase I ESA, Alexandria, VA
- Merrill House Apartments Phase I ESA, Falls Church, VA
- West Virginia University Engineering Research Building Pre-Renovation Asbestos Survey, Morgantown, WV
- 601 Massachusetts Avenue Phase I ESA, Washington, DC

Joseph Saldana

Environmental Scientist

Education
Bachelor of Science Old Dominion University
Environmental Engineering

Certifications
LEED Green Associate

Years of Experience
Prior to ECS: Five Years

Mr. Saldana serves as an Environmental Scientist in the Chantilly, Virginia office.

Mr. Saldana has more than five years experience in various environmental consulting roles. His experience includes LEED IAQ projects, asbestos inspections and sampling, mold inspection certification, and other industrial hygiene/environmental inspections. As an Environmental Scientist, he is responsible for preparation of Phase I Environmental Site Assessments. He is tasked with preforming environmental investigations at sites impacted by petroleum hydrocarbons, dry cleaners, historic landfills, industrial properties, and rail yards.

Sample Project Experience

Phase I Environmental Site Assessments, Various Locations in VA – Mr. Saldana has completed Phase I Environment Site assessments within the Washington D.C metro area on properties ranging from undeveloped woodland to industrial sites. These studies have involved the identification of potential recognized environmental conditions related to petroleum or chemical spills or releases, hazardous substances, underground storage tanks, asbestos, and similar environmental concerns.

Appendix VIII: Acronyms

List of Common Acronyms

AULs	Activity and Use Limitations
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
ACM	Asbestos Containing Materials
BER	Business Environmental Risk
CORRACTS	CERCLA Corrective Action List
NPL	CERCLA National Priorities List
NFRAP	CERCLA No Further Remedial Action Planned
CERCLA	Comprehnsive Environmental Response Cleanup Liability Act
CESQG	Conditionally Exempt Small Quantity Generator
CREC	Controlled Recognized Environmental Condition
ERNS	Emergency Response Notification System
EC	Engineering Controls
HIST LF	Historical Landfill
HREC	Historical Recognized Environmental Condition
IC	Institutional Controls
LQG	Large Quantity Generator
LBP	Lead Based Paint
LTANKS	Leaking Tanks
LUST	Leaking Underground Storage Tank
REC	Recognized Environmental Condition
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
SQG	Small Quantity Generator
SWF/LF	Solid Waste Facility/Landfill
SHWS	State Hazardous Waste Sites
UST	Underground Storage Tank
USGS	United States Geological Survey

EXHIBIT F

Fiscal Impact Analysis

Fiscal Impact Analysis

Ashton Green
Front Royal, Virginia

Prepared for:
Walton Mahon and Chris Hornung
Rappahannock Development Group

April 2024

S. PATZ & ASSOCIATES, INC
REAL ESTATE CONSULTANTS

▪ S. PATZ & ASSOCIATES, INC ▪

▪ REAL ESTATE CONSULTANTS ▪

April 1, 2024

Walton Mahon and Chris Hornung
Rappahannock Development Group
1016 Charles Street
Fredericksburg, VA 22401

Walton and Chris,

Enclosed is our full narrative Fiscal Impact Analysis (FIA) for the proposed Ashton Green subdivision, set to be constructed south of Happy Creek Road, near its intersection with Leach Run Parkway in the Town of Front Royal, Virginia. The project entails the construction of 104 single-family homes for sale.

The FIA to follow documents the net tax benefits that will accrue to the Town of Front Royal annually at build-out. This includes both on-site (real estate and personal property taxes) and off-site benefits, which include expenditures from future residents and businesses. These calculations do not account for any tax revenues that would accrue to Warren County, as that requires a separate calculation and is not within the scope of this analysis.

The table below summarizes these calculations. It indicates that the proposed development of Ashton Green is projected to increase the Town of Front Royal's annual revenues by an estimated $407,620. This equates to approximately $3,920 per single-family home.

Summary of On-Site and Off-Site Fiscal Impacts of Residential Units, Ashton Green at Build-Out, Town of Front Royal, VA (Constant 2024 Dollars)			
Source of Fiscal Impacts in Town of Front Royal	**Impacts On-Site in Town of Front Royal**	**Impacts Off-Site in Town of Front Royal**	**Total Fiscal Impacts**
Roanoke Model (21 Homes)			
Revenues to the Town	$66,840	$49,360	$116,200
Town Costs	-$21,500	-$14,590	-$36,090
Subtotal	*$45,340*	*$34,770*	*$80,110*
Saint Lawrence Model (47 Homes)			
Revenues to the Town	$155,310	$115,040	$270,350
Town Costs	-$48,000	-$40,700	-$88,700
Subtotal	*$107,310*	*$74,340*	*$181,650*
Corsica Model (36 Homes)			
Revenues to the Town	$123,230	$91,370	$214,600
Town Costs	-$36,100	-$32,640	-$68,740
Subtotal	*$87,130*	*$58,730*	*$145,860*
Ashton Green Total (104 Homes)			
Revenues to the Town	$345,380	$255,770	$601,150
Town Costs	-$105,600	-$87,930	-$193,530
Net Fiscal Benefits	**$239,780**	**$167,840**	**$407,620**

Source: Town of Front Royal; S. Patz & Associates, Inc.

The analysis is presented in constant 2024 dollars and considers both on-site and off-site impacts within the Town of Front Royal. These projections underscore the economic viability of the Ashton Green development as a substantial contributor to the town's fiscal health.

The detailed data that supports our findings and conclusions are presented in the attached report. Please call if additional data or clarifications are required. We remain available to continue to assist you with the successful development of Ashton Green.

Sincerely,

Ariel Goldring

Ariel Goldring
President

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Section I: Introduction

The following report presents a Fiscal Impact Analysis (FIA) of the proposed development of Ashton Green. Situated near the southwestern intersection of Happy Creek Road and Leach Run Parkway in the Town of Front Royal, Virginia, the 41.1-acre property is currently zoned as R-S (Suburban Residential). This classification permits a maximum by-right yield of 82 single-family homes. The development program for Ashton Green involves rezoning the property to R-1 (Medium Density Single-Family), enabling the development of 104 single-family homes and representing a net increase of 22 homes over the by-right total. The new homes at Ashton Green are planned to average 3,071 square feet in size, with sales prices ranging from $592,657 to $612,657.

This effort will be supported by the following Fiscal Impact Analysis (FIA), which calculates the net tax benefits that will accrue to the Town of Front Royal once Ashton Green is built and occupied. The FIA to follow includes net tax benefits from on-site development and off-site expenditures in the town, as will be fully explained in the report. The FIA is based on the ability of the site to be developed and occupied, as planned.

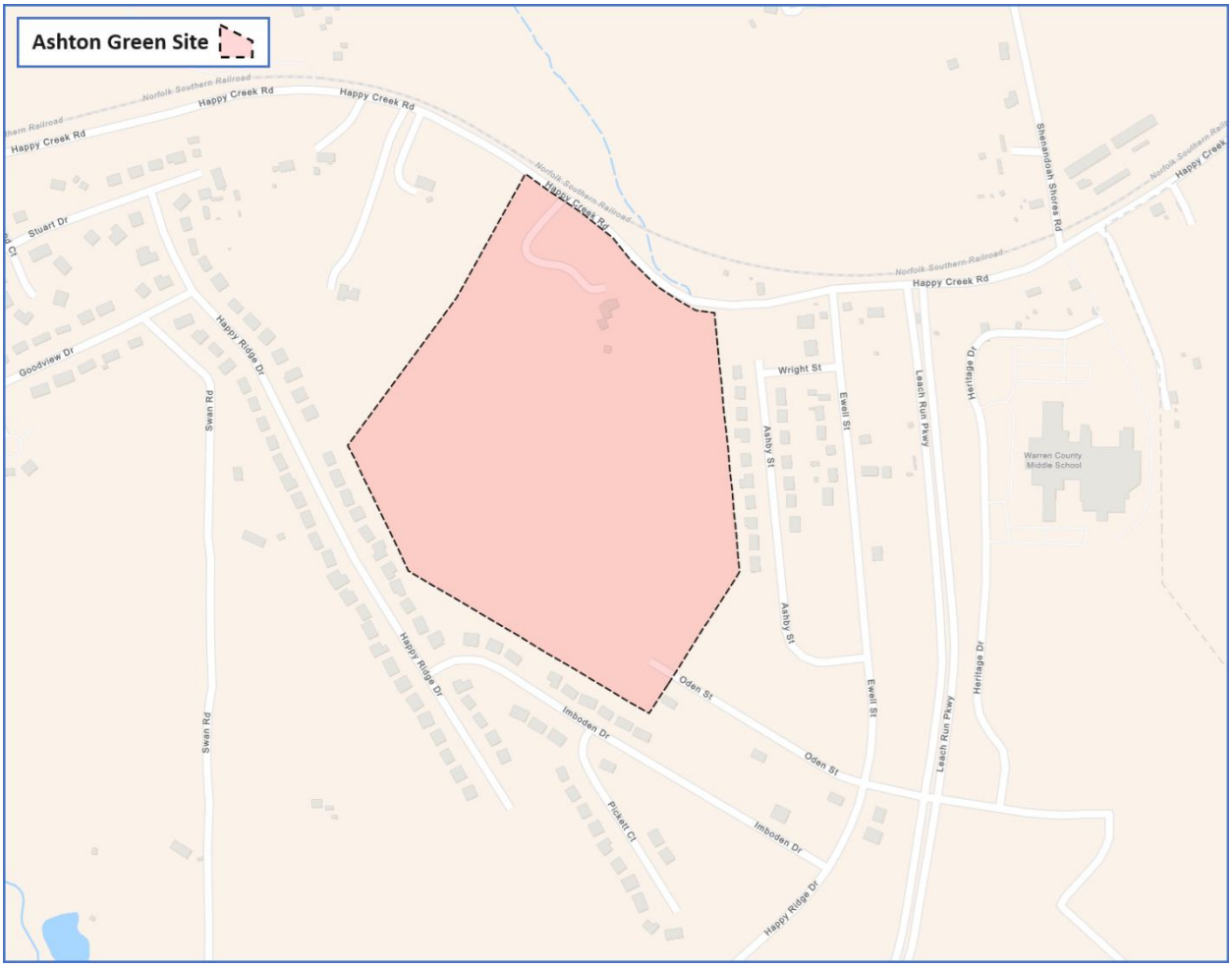
The report is divided into two main sections. The Introduction section analyzes the Ashton Green site and outlines the development proposal. While a market analysis was not included in this report, it may be incorporated in a revised version if deemed necessary by town staff. Based on numerous other recent assignments undertaken by S. Patz & Associates in the region, the Ashton Green proposal is anticipated to be market-supported.

Section II calculates the full narrative FIA, documenting annual net tax revenue from the Ashton Green proposal. This calculation includes on-site net revenues and off-site revenues from on-site expenditures, with town costs deducted to determine the net fiscal benefit. All tax revenue and cost data are presented in constant 2024 dollars for this analysis.

Ashton Green

Site Description

Map A displays the Ashton Green development site's location within the eastern section of the Town of Front Royal. The site comprises an irregularly shaped parcel covering approximately 41.109 acres on the southern side of Happy Creek Road, near its intersection with Leach Run Parkway. The Ashton Green site is situated approximately 2.5 miles east of Downtown Front Royal, a mile from Warren Memorial Hospital, and less than six miles southeast of the Walmart- and Lowe's-anchored Riverton Commons and the Target-anchored Crooked Run Center.

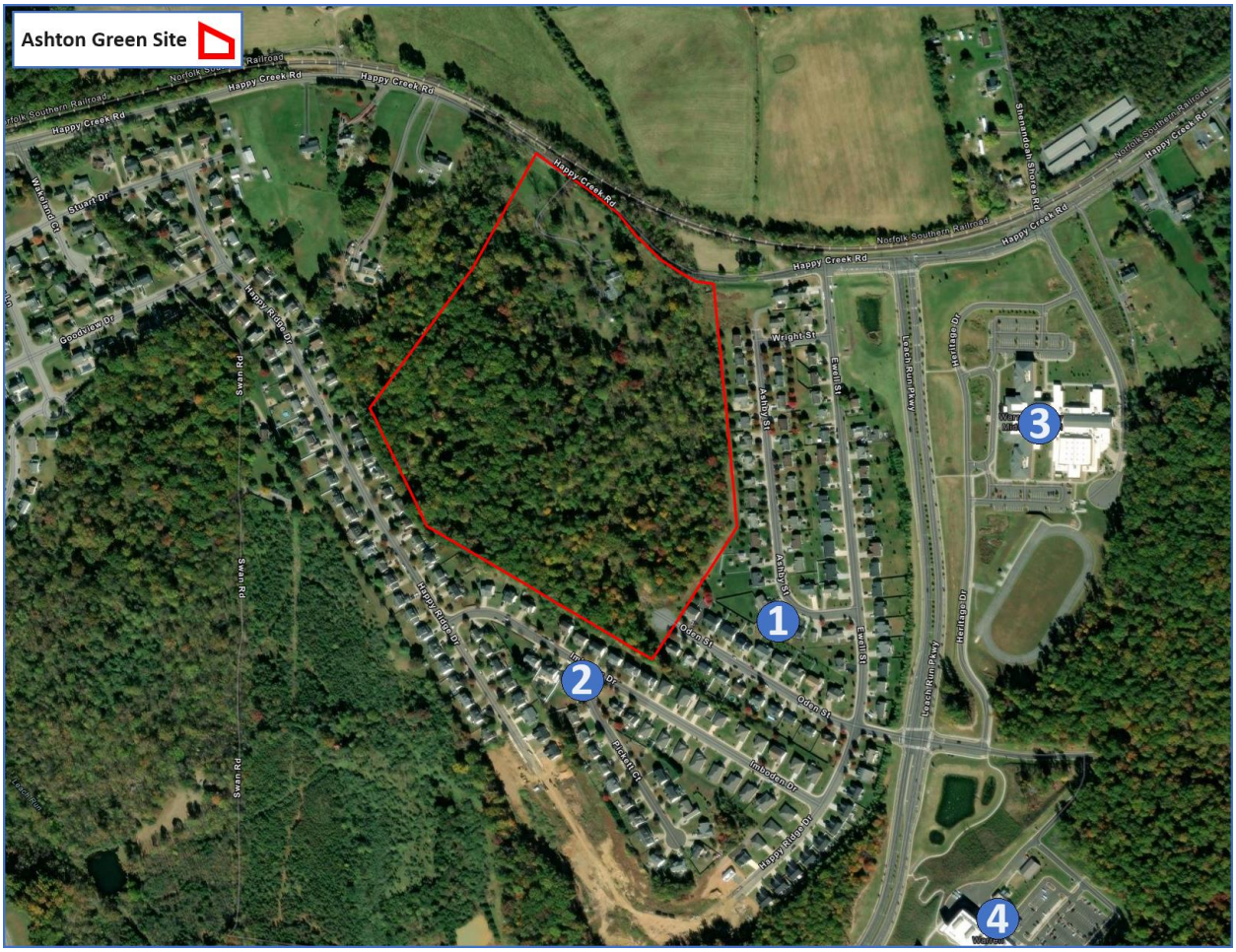


Map A – Site Location

The following is a northern aerial view of the study site. The site is depicted as large with a generally flat topography. It is primarily vacant and wooded, apart from a four-bedroom single-family home constructed in 1969. Happy Creek Road to the north and Oden Street to the southeast facilitate access to the site.

The aerial view shows the site's proximity to various land uses, none of which are expected to impact the proposed development negatively. Directly east of the site are the Oden Ridge (Note 1) and Happy Creek Knolls subdivisions (Note 2). These areas, primarily developed starting in the early 2000s, feature recent home sales prices ranging from the mid-$300,000s to $500,000s. These are attractive subdivisions comprised of well-maintained single-family homes.

To the east of the Ashton Green site, on the east side of Leach Run Parkway, is Warren County Middle School (Note 3), which would serve future school-aged children at the property. The expansive Warren Memorial Hospital is further south along Leach Run Parkway (Note 4). This is a roughly 17,000-square-foot, three-story acute-care hospital that opened in the summer of 2021. It includes 36 private patient rooms, 18 emergency beds, six observation beds, three operating rooms, and one cardiac catheterization lab. The 150-acre campus provides space for future expansion phases. It replaced an older hospital that was built off Shenandoah Avenue in the early 1950s.

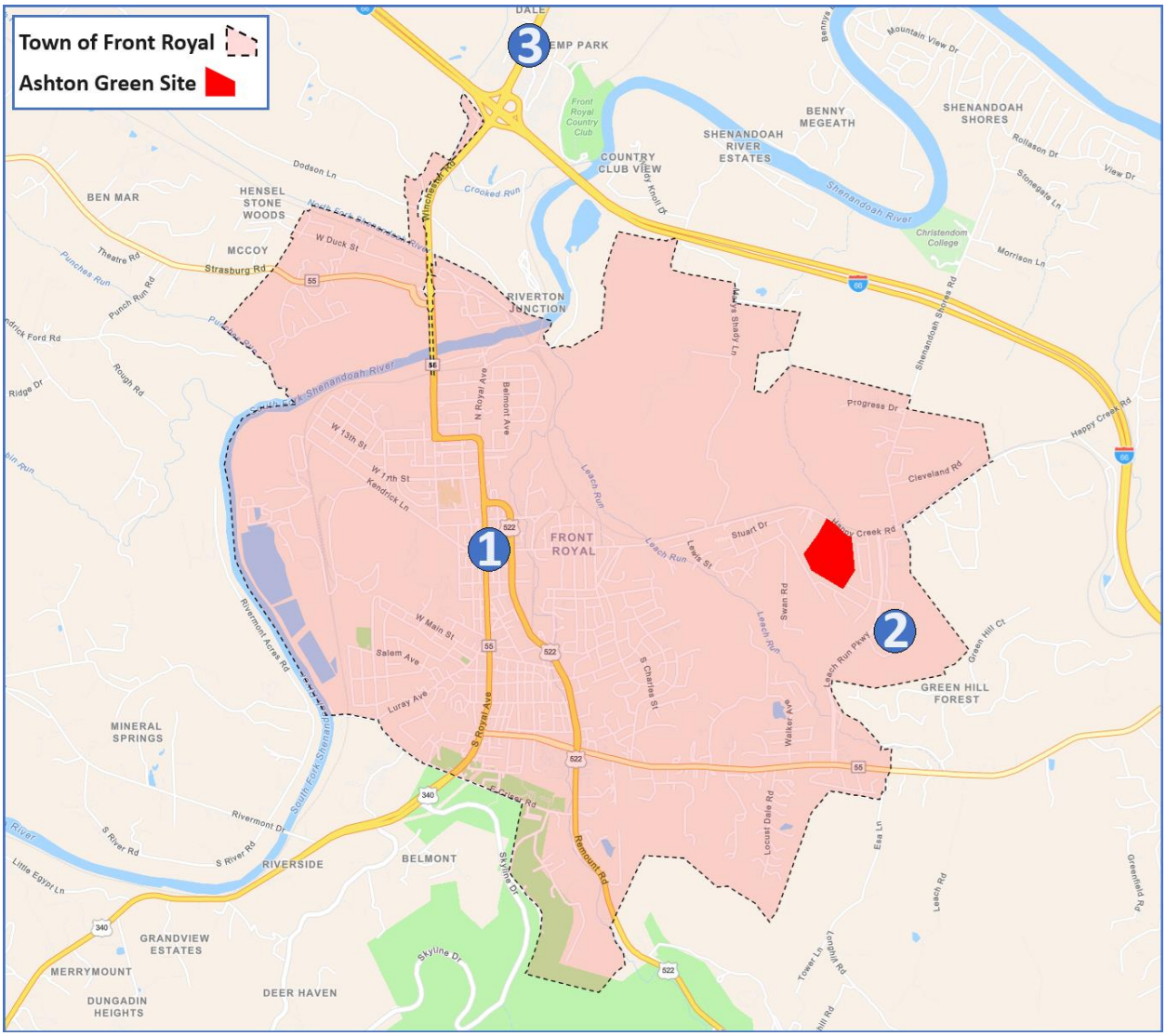


Northern Aerial

Map B depicts the Ashton Green setting within the Town of Front Royal. It illustrates the site's proximity to the intersection of Leach Run Parkway and Happy Creek Road. Leach Run Parkway extends for approximately 1.3 miles between John Marshall Highway in the south and Happy Creek Road to the north. This four-lane, limited-access highway has a 35-mph speed limit and features streetlights, sidewalks on both sides, bicycle lanes, and a median divider. Additionally, the roadway includes intersections controlled by traffic signals at both Happy Creek Road and John Marshall Highway.

Both Happy Creek Road and John Marshall Highway provide access to Downtown Front Royal (Note 1), approximately three miles west of the study site. Downtown hosts a diverse mix of restaurants and retailers, including the nearest grocery store, Martin's. Map B also highlights the proximity of Warren Memorial Hospital (Note 2), a significant local employer.

The third development node shown in Map B is the retail cluster at the intersection of I-66 and Winchester Road (Note 3). This area, which is just outside of the town limits, hosts several big-box retailers, including Target, Walmart, Lowe's Home Improvement, Petco, and Michael's, as well as an Aldi grocery store and various restaurants.



Map B – Site Setting

To summarize, the Ashton Green site is situated in a desirable setting near Downtown Front Royal. It is conveniently located close to the region's employment centers, major roadways, a hospital, and a comprehensive array of retailers and restaurants.

Development Program

The proposed concept plan for Ashton Green is shown below. The site plan illustrates 104 lots, featuring internal roadways that will provide access to each single-family home site. Access to the community will be available from the southeast via Oden Street. Two stormwater management (SWM) ponds are planned for the northern part of the property, fronting Happy Creek Road. Notably, the plan includes an abundance of open and green spaces within the community, with four open space lots proposed.

Ashton Green Concept Plan

Table 1 below outlines the proposed home types to be offered at Ashton Green. The community will feature a total of 104 single-family homes, with an expected mix of 21 Roanoke models, 47 Saint Lawrence models, and 36 Corsica models. Both the Roanoke and Saint Lawrence models will offer at least four bedrooms, with sizes ranging from 2,757 to 3,084 square feet, respectively. The Roanoke models are expected to be listed for between $565,990 and $585,990,

while the Saint Lawrence models are expected to range from $591,990 to $639,990. The Corsica models, being larger, will average 3,371 square feet, include at least three bedrooms, and are projected to be listed for between $619,990 and $639,990. All homes in Ashton Green will feature two levels, two-car garages, and unfinished basements.

Table 1: Proposed Home Characteristics, Ashton Green, Front Royal, Virginia

Product Type	Total Homes	Home Size (Sq. Ft.)	List Prices	Levels	Bed/ Bath	Garage
Roanoke	21	2,757	$565,990-$585,990	2	4+/2+	2+
Saint Lawrence	47	3,084	$591,990-$611,990	2	4+/2+	2+
Corsica	36	3,371	$619,990-$639,990	2	3+/2+	2+
Total	**104**					

Source: Rappahannock Development Corporation

Section II: Fiscal Impact Analysis

This section of the report outlines the methodology and findings of the Fiscal Impact Analysis (FIA) for the proposed Ashton Green subdivision in the Town of Front Royal. The FIA assesses the tax revenues expected from the redevelopment against the town's tax-supported costs for serving the project once the homes are built and occupied. The net fiscal benefits are calculated as the difference between these revenues and the various costs incurred by the town due to the new development. As noted above, the development program comprises 104 single-family homes for sale.

The report considers on-site fiscal impacts directly associated with Ashton Green. Off-site fiscal impacts, resulting from the spin-off effects of resident and employee expenditures within the town, are analyzed separately. Economic impact assessments are performed to gauge off-site impacts. These assessments aim to show how consumer spending will foster new business in the Town of Front Royal. They consider new business receipts, employment, and employee earnings stemming from these expenditures.

Data in the upcoming tables are rounded to the nearest ten dollars and represent annual amounts post-build-out. All data are presented in constant 2024 dollars.

Summary of Residential Impacts

Table 2 summarizes the revenues, costs, and net fiscal benefits (revenue surplus or deficit) for the proposed 104 homes for sale at Ashton Green. It also includes the economic activity expected to be generated in the town by off-site residents.

On-site impacts for residential uses often produce a relatively modest annual surplus, principally due to costs for public school students expected to live in the community. This is not a negative issue in this case, as the town does not independently operate any schools. Local schools are funded at the County level. The resident expenditures in Front Royal will also generate a sizable level of new business receipts in the town.

Upon completion and full occupancy of homes at Ashton Green, a positive annual fiscal benefit is expected, amounting to approximately $407,620, reported in constant 2024 dollars.

Table 2: Summary of On-Site and Off-Site Fiscal Impacts of Residential Units, Ashton Green at Build-Out, Town of Front Royal, VA
(Constant 2024 Dollars)

Source of Fiscal Impacts in Town of Front Royal	Impacts On-Site in Town of Front Royal	Impacts Off-Site in Town of Front Royal	Total Fiscal Impacts
Roanoke Model (21 Homes)			
Revenues to the Town	$66,840	$49,360	$116,200
Town Costs	-$21,500	-$14,590	-$36,090
Subtotal	*$45,340*	*$34,770*	*$80,110*
Saint Lawrence Model (47 Homes)			
Revenues to the Town	$155,310	$115,040	$270,350
Town Costs	-$48,000	-$40,700	-$88,700
Subtotal	*$107,310*	*$74,340*	*$181,650*
Corsica Model (36 Homes)			
Revenues to the Town	$123,230	$91,370	$214,600
Town Costs	-$36,100	-$32,640	-$68,740
Subtotal	*$87,130*	*$58,730*	*$145,860*
Ashton Green Total (104 Homes)			
Revenues to the Town	$345,380	$255,770	$601,150
Town Costs	-$105,600	-$87,930	-$193,530
Net Fiscal Benefits	**$239,780**	**$167,840**	**$407,620**

Source: Town of Front Royal; S. Patz & Associates, Inc.

In addition to on-site fiscal impacts, off-site economic impacts in Front Royal, arising from new resident expenditures, would generate additional tax revenue. Based on projected household incomes, resident expenditures could amount to approximately $12.60 million annually at businesses in the town, with another $25.82 million in business expenditures anticipated from the "ripple effect" of resident spending across the local economy. This would result in a total of $38.42 million in new business activity within the town.

Off-site expenditures are expected to generate new jobs across the region, not limited to the Town of Front Royal. The annual earnings from these new jobs will have additional fiscal impacts region-wide. These calculations were reduced by 40 percent to account for consumer spending outside of the town or through online platforms. Therefore, the off-site calculations reflect expenditures solely within the Town of Front Royal.

The subsequent analysis outlines the derivation of fiscal impacts resulting from the development at the Ashton Green site. These impacts include the net fiscal benefits of the proposed single-family homes, representing the difference between tax revenue generated for the Town of Front Royal and the costs of public services required for the residents of the new development. As mentioned earlier, economic impacts encompass new business revenue, employment, and employee earnings that would accrue in the town due to annual resident expenditures.

On-Site Fiscal Impacts from Ashton Green

The following analysis details the revenues generated for the Town of Front Royal from Ashton Green "on-site." "On-site" refers to revenues directly derived from real estate development and personal property taxes, while "off-site" impacts stem from local business growth due to new resident expenditures. These off-site impacts will be addressed separately as economic impacts, though their fiscal benefits are also evaluated. Data in the upcoming tables are rounded to the nearest ten dollars and represent annual amounts post-build-out. All data are presented in constant 2024 dollars.

Table 3 summarizes the various revenues to accrue to the Town of Front Royal from the development and sales of the 104 single-family homes to be built at Ashton Green. Real Estate and Emergency Services taxes would account for nearly 77 percent of the on-site revenue. Smaller consumer utility taxes, personal property taxes, motor vehicle license fees, and trash/recycling fees account for nearly a quarter of the $345,380 in on-site tax revenue.

Table 3: Summary of Annual On-Site Revenues, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Amount	Percent of Total
Roanoke Model (21 Homes)		
Real Estate Tax	$12,100	18.1%
Emergency Services Tax	$38,710	57.9%
Personal Property Tax	$3,840	5.7%
Motor Vehicle Licenses	$1,050	1.6%
Consumer Utility Tax	$4,030	6.0%
Trash and Recycling Tax	$7,110	10.6%
Net Fiscal Benefits	*$66,840*	*100.0%*
Saint Lawrence Model (47 Homes)		
Real Estate Tax	$28,290	18.2%
Emergency Services Tax	$90,540	58.3%
Personal Property Tax	$9,200	5.9%
Motor Vehicle Licenses	$2,350	1.5%
Consumer Utility Tax	$9,020	5.8%
Trash and Recycling Tax	$15,910	10.2%
Net Fiscal Benefits	*$155,310*	*100.0%*
Corsica Model (36 Homes)		
Real Estate Tax	$22,680	18.4%
Emergency Services Tax	$72,580	58.9%
Personal Property Tax	$7,180	5.8%
Motor Vehicle Licenses	$1,700	1.4%
Consumer Utility Tax	$6,910	5.6%
Trash and Recycling Tax	$12,180	9.9%
Net Fiscal Benefits	$123,230	*100.0%*
Ashton Green Total (104 Homes)		
Real Estate Tax	$63,070	18.3%
Emergency Services Tax	$201,830	58.4%
Personal Property Tax	$20,220	5.9%
Motor Vehicle Licenses	$5,100	1.5%
Consumer Utility Tax	$19,960	5.8%
Trash and Recycling Tax	$35,200	10.2%
Net Fiscal Benefits	**$345,380**	**100.0%**

Source: Town of Front Royal; S. Patz & Associates, Inc.

The following paragraphs detail each revenue source. A separate section of the report addresses the costs of services and facilities that the Town of Front Royal must provide to support the future apartment units.

Real Estate Tax

Anticipated home sales prices at Ashton Green are expected to range between $565,990 and $639,990, depending on the home models. Included in this range are the Roanoke model, anticipated to sell for between $565,990 and $585,990; the Saint Lawrence model, expected to sell

between $591,990 and $611,990; and the Corsica model, projected to sell for between $619,990 and $639,990. To adopt a conservative approach, it is assumed that the new homes will be sold at the midpoint of these values.

At the town's real estate tax rate of $0.10 per $100 of assessed value, real estate taxes would total $12,100 for the Roanoke model, $28,290 for the Saint Lawrence model, and $22,680 for the Corsica model. This amounts to a total of $63,070, as shown in Table 3 below.

Table 3: Real Estate Tax, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Average Price per Home	$575,990	$601,990	$629,990	$606,432
Number of Homes	21	47	36	104
Total Price	$12,095,790	$28,293,530	$22,679,640	$63,068,960
Tax Rate	$0.10/$100	$0.10/$100	$0.10/$100	$0.10/$100
Real Estate Tax	**$12,100**	**$28,290**	**$22,680**	**$63,070**

Source: Town of Front Royal; S. Patz & Associates, Inc.

Emergency Services Tax

The Town of Front Royal imposes an emergency services tax on real estate properties to support fire and other emergency services. With the town's emergency services tax rate set at $0.32 per $100 of assessed value, emergency services taxes are expected to total approximately $201,830 annually after build-out. This total includes $38,710 generated from the Roanoke models, $90,540 from the Saint Lawrence models, and $72,580 from the Corsica models, as illustrated in Table 4 below.

Table 4: Real Estate Tax, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Average Price per Home	$575,990	$601,990	$629,990	$606,432
Number of Homes	21	47	36	104
Total Price	$12,095,790	$28,293,530	$22,679,640	$63,068,960
Tax Rate	$0.32/$100	$0.32/$100	$0.32/$100	$0.32/$100
Real Estate Tax	**$38,710**	**$90,540**	**$72,580**	**$201,830**

Source: Town of Front Royal; S. Patz & Associates, Inc.

Personal Property Tax

Certain assumptions based on typical car ownership rates are necessary to estimate the number of cars at Ashton Green. Table 5 estimates car ownership at Ashton Green, once built out, across different home types.

Car ownership percentages were derived based on assumptions about the likely demographics and lifestyle of residents in each unit type. For instance, homes with more bedrooms, such as the four-bedroom Roanoke and Saint Lawrence models, are presumed to have more cars, with 70 percent having two cars and 15 percent having three cars, reflecting the needs of larger families or households. Conversely, the Corsica model, with fewer bedrooms, is assumed to have slightly fewer cars. These assumptions were then applied to calculate each unit type's total number of cars, yielding a comprehensive overview of car ownership across the entire subdivision. In total, the Roanoke and Saint Lawrence models are projected to have an average of 2.00 cars per household. The Corsica model is projected to have 1.89 cars per household.

Ashton Green, comprising 104 homes of various types, is estimated to accommodate approximately 204 cars. This results in an average ratio of 1.96 cars per home, which is a conservative estimate.

Table 5: Anticipated Number of Cars, Ashton Green at Build-Out, Front Royal, VA

Model Type	Total Homes	Bedrooms	Garage Spaces	One Car	Two Car	Three Car	Total Cars	Average Cars/ Home
Roanoke	21	4	2	15%	70%	15%	42	2.00
Saint Lawrence	47	4	2	15%	70%	15%	94	2.00
Corsica	36	3	2	20%	70%	10%	68	1.89
Total	**104**						**204**	**1.96**

Source: S. Patz & Associates, Inc.

Residential personal property taxes in Virginia are determined based on the depreciated values of vehicles used exclusively for residential purposes. Given the anticipated home sales prices, the anticipated household incomes of future Ashton Green residents are expected to surpass Front Royal's average household income. As such, calculating the average depreciated

value of vehicles in Front Royal does not offer pertinent data to estimate the anticipated vehicle values of future residents.

The depreciated value of vehicles owned by a household can be influenced by various factors, making it challenging to derive an accurate estimate based solely on income. These factors include the original purchase price, the age and model of the vehicles, maintenance standards, mileage, and the overall market demand for used cars.

Considering the anticipated incomes of future residents, the average vehicle values for Ashton Green residents are projected at $23,500 for the Roanoke model, $24,500 for the Saint Lawrence model, and $25,700 for the Corsica model. These estimates are conservative. The Town of Front Royal provides a personal tax relief rate (PPTR) at 46 percent on the value of the first $20,000 of assessed values for vehicles with an assessed value greater than $1,000. Thus, this reduces the taxable value of the vehicles to $14,300, $15,300, and $16,500, respectively. At these values, the total on-site personal property value for residents at Ashton Green would reach approximately $3.16 million.

At the tax rate of $0.64 per $100 of assessed value, on-site personal property taxes would amount to $20,220 annually. This is detailed in Table 6.

Table 6: Personal Property Taxes, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Number of Homes	21	47	36	104
Vehicles per Unit	2.00	2.00	1.89	1.96
Number of Vehicles	42	94	68	204
Depreciated Value per Vehicle	$23,500	$24,500	$25,700	$24,567
With 46% PPTR Rate	$14,300	$15,300	$16,500	$15,367
Total Depreciated Value	$600,600	$1,438,200	$1,122,000	$3,160,800
Tax Rate	$0.64/$100	$0.64/$100	$0.64/$100	$0.64/$100
Real Estate Tax	**$3,840**	**$9,200**	**$7,180**	**$20,220**

Source: Town of Front Royal; S. Patz & Associates, Inc.

Motor Vehicle Licenses

Each motor vehicle in the Town of Front Royal is subject to a vehicle license fee of $25. In the derivation of personal property taxes in Table 5, it was shown that there would be an estimated 204 vehicles at the property. At a fee of $25 per vehicle, the total tax from this source would be $5,100. This calculation is shown in Table 7 below.

Table 7: Motor Vehicle License Fees, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Number of Homes	21	47	36	104
Vehicles per Unit	2.00	2.00	1.89	1.96
Number of Vehicles	42	94	68	204
License Fee	$25/Vehicle	$25/Vehicle	$25/Vehicle	$25/Vehicle
Real Estate Tax	**$1,050**	**$2,350**	**$1,700**	**$5,100**

Source: Town of Front Royal; S. Patz & Associates, Inc.

Consumer Utility Tax

Consumer utility taxes are levied on expenditures for consumer utilities, such as electricity, gas, telephone, and cable. While the tax rates for the different utilities vary, experience has shown that the average tax is about $4.00 per utility per month. Calculating for four utilities per household, with an average of $4.00 per utility per month over 12 months, the total utility tax for Ashton Green would amount to $19,960 annually. This calculation is detailed in Table 8.

Table 8: Consumer Utility Taxes, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Number of Homes	21	47	36	104
Utilities per Home	4	4	4	4
Each Utility Average	$4.00	$4.00	$4.00	$4.00
Number of Months	12	12	12	12
Total Utility Tax	**$4,030**	**$9,020**	**$6,910**	**$19,960**

Source: Town of Front Royal; S. Patz & Associates, Inc.

Trash Collection and Recycling Tax

The Town of Front Royal levies a monthly tax of $14.10 for each 96-gallon trash and recycling container. Each of the 104 homes at Ashton Green is expected to have one trash and one recycling container, for a total of 208 containers. Over 12 months, the total trash collection and recycling taxes would amount to $35,200, as shown in Table 9 below.

Table 9: Trash Collection and Recycling Taxes, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Number of Homes	21	47	36	104
Containers per Homes	2	2	2	2
Total Containers	42	94	72	208
Price per Container (96 gallon)	$14.10	$14.10	$14.10	$14.10
Number of Months	12	12	12	12
Total Trash/ Recycling Tax	**$7,110**	**$15,910**	**$12,180**	**$35,200**

Source: Town of Front Royal; S. Patz & Associates, Inc.

On-Site Fiscal Impacts: Town Costs to Serve Ashton Green

The on-site fiscal impact analysis focuses on the costs to the Town of Front Royal from Ashton Green, specifically related to the General Fund Budget expenditures expressed on a per capita basis. These per capita expenditures are allocated proportionally to residents and businesses (in terms of employee numbers) based on their utilization of each service type. These costs encompass both operational services and capital improvements in the form of annual debt service to support the town's capital improvement programs.

The budget expenditures will be discussed below, and per capita costs will be calculated based on user types. Applying these per capita costs to the residents of Ashton Green yields an estimate of the annual costs for the town to provide services to the proposed single-family homes.

For the town's adopted FY 2024 budget, approximately 65.5 percent of all General Fund expenditures are covered by local taxes, with the remainder coming from state and federal government revenues. An analysis of the budgeted revenues for the year will illustrate this

proportion. The fiscal impact costs are derived from General Fund expenditures supported by local taxes.

Table 10: General Fund Revenue by Type from Local Taxes, Front Royal, Virginia

	Amount	Percent
General Property Taxes		
Real Estate Taxes		
Current taxes	$931,665	7.3%
Delinquent R/E	-$3,725	0.0%
Public Service R/E	$19,950	0.2%
Public Service P/P	$1,570	0.0%
Personal Property Taxes		
Current taxes	$503,495	3.9%
Delinquent P/P	-$58,580	-0.5%
Penalty on Taxes	$19,970	0.2%
Interest on Taxes	$24,575	0.2%
Total General Property Taxes	*$1,438,920*	*11.2%*
Other Local Taxes		
Sales Tax - Warren County	$1,433,735	11.2%
BPOL	$940,725	7.3%
Penalty BPOL	$12,990	0.1%
Franchise Tax	$73,520	0.6%
Deregulation	$800	0.0%
Consumer Tax	$182,720	1.4%
Deregulation-Local	$51,760	0.4%
Auto Decals	$384,600	3.0%
Bank Stock Tax	$313,170	2.4%
Lodging Tax	$299,960	2.3%
Short Term Rental Tax	$10,000	0.1%
Meals Tax	$2,388,000	18.6%
PILOT	$561,990	4.4%
PILOT - Warren County	$321,410	2.5%
Total Other Local Taxes	*$6,975,380*	*54.3%*
Subtotal Local Taxes	$8,414,300	65.5%
Non-Tax Revenue	$4,426,250	34.5%
Total General Fund Revenue	**$12,840,550**	**100.0%**
Percent Tax Revenue	**65.53%**	

Source: Adopted FY 2024 Budget for the Town of Front Royal, Virginia

When the expenditures for each type of user are determined, and the tax-supported proportions are calculated, these costs are then divided by the number of persons by type. The most recent census data show that the Town of Front Royal has a population of 15,260±. Calculating the number of employees who physically work within the Town limits is more

challenging, as the U.S. Bureau of Labor Statistics (BLS) only tracks the number of at-place jobs at the county-wide level, not the town level. This is the standard source of employment data for analyses of this type.

The Front Royal Warren County Economic Development Authority does not track the number of employees within the town limits. State and regional economic development agencies do not track this data either. Thus, for the sake of this analysis, it was assumed that half of Warren County's 13,350± at-place jobs are located within the Town of Front Royal. Since the Town of Front Royal does not operate independent schools, a parks & recreation department, or a health & welfare department, per capita expenditures for residents and employees are the same, at $384.

The General Fund budget total for the town for FY 2024 is $12.8 million, with 69.6 percent of that cost for the town's resident population and 30.5 percent for employment, or persons with jobs in the town.

Table 11: Allocation of General Fund Expenditures by Type for Residents (Population) and Businesses (Employees), Town of Front Royal, Virginia			
	FY 2024 Adopted: Population	**FY 2024 Adopted: Employment**	**FY 2024 Adopted: Total**
Town Council	$145,919	$63,876	$209,795
Clerk of Council	$37,312	$16,333	$53,645
Board of Elections	$11,129	$4,871	$16,000
Town Manager	$221,639	$97,021	$318,660
HR & Risk Management	$292,235	$127,925	$420,160
Benefits & Insurance	$428,796	$187,704	$616,500
Information Technology	$439,487	$192,383	$631,870
Community Development/ Special Events	$85,425	$37,395	$122,820
Tourism	$194,954	$85,341	$280,295
Finance	$692,087	$302,958	$995,045
Town Attorney	$331,491	$145,109	$476,600
Police	$4,216,858	$1,845,912	$6,062,770
Economic Development	$54,102	$23,683	$77,785
Planning & Zoning	$383,166	$167,729	$550,895
Transfer/ Debt	$427,600	$187,180	$614,780
Fleet Management	$394,653	$172,757	$567,410
General Properties	$304,202	$133,163	$437,365
Horticulture	$269,975	$118,180	$388,155
Total	**$8,931,030**	**$3,909,520**	**$12,840,550**
Percent Tax Support	65.53%	65.53%	65.53%
Tax-supported Expenditures	$5,852,426	$2,561,874	$8,414,300
Number of Persons	15,260	6,680	21,940
Per Capita Tax Support	$384	$384	$384
Sources: FY 2024 Adopted Budget for Front Royal, Virginia; Virginia Employment Commission; S. Patz & Associates, Inc.			

Tax-Supported Costs of Ashton Green

As explained above, the costs to the town to serve Ashton Green are calculated by multiplying the per capita costs of residents and employees. These are tax-supported costs, which will be compared to the taxes generated by Ashton Green. The costs encompass operating expenses for general government, as well as the costs of facilities in terms of debt service for capital improvements.

Table 12 estimates the average household sizes for Ashton Green, categorized by the different types of housing units. The four-bedroom units are presumed to have an average household size of 2.65, while the three-bedroom units are projected to have a slightly smaller household size of 2.60.

Table 12: Projected Household Size, Ashton Green at Build-Out, Front Royal, VA				
Model Type	**Total Homes**	**Bedrooms**	**Average Household Size**	**Total Population**
Roanoke	21	4	2.65	56
Saint Lawrence	47	4	2.65	125
Corsica	36	3	2.60	94
Total	**104**			**275**

Source: S. Patz & Associates, Inc.

In total, the new homes at Ashton Green are estimated to house approximately 275 residents. This figure incorporates the varied living arrangements across all unit types. As previously calculated in Table 11, the average tax-supported cost per resident in the town is $384. Therefore, for the residents of Ashton Green, the total tax-supported costs to the Town of Front Royal would be approximately $105,600. This calculation is detailed in Table 13 below.

Table 13: Tax Supported Costs for Residents, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Number of Homes	21	47	36	104
Persons per Home	2.65	2.65	2.60	2.63
Population	56	125	94	275
Expenditure per Capita	$384	$384	$384	$384
Tax Supported Costs	**$21,500**	**$48,000**	**$36,100**	**$105,600**

Source: Town of Front Royal; S. Patz & Associates, Inc.

On-Site Fiscal Impacts from Ashton Green

The data in Table 14 compare the calculated on-site tax revenues expected from Ashton Green at build-out with the tax-supported costs required to serve the residents of the new subdivision. The data show that the development of the community results in a net surplus of $239,780.

Table 14: Net On-Site Fiscal Tax Benefits, Ashton Green at Build-Out, Front Royal, VA
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Total Tax Revenue	$66,840	$155,310	$123,230	$345,380
Population Expenditures	-$21,500	-$48,000	-$36,100	-$105,600
Net Fiscal Benefit	**$45,340**	**$107,310**	**$87,130**	**$239,780**

Source: Town of Front Royal; S. Patz & Associates, Inc.

Off-Site Fiscal Impacts from Ashton Green

In addition to the revenues and costs accruing to the Town of Front Royal from the "on-site" homes – that is, from the residential units and the residents themselves in their dwellings – there are also off-site impacts. These occur as residents spend part of their income within the town on consumer goods and as businesses reinvest income from residents' purchases into buying goods and services from other vendors in the town. To account for expenditures occurring outside of Front Royal or through online platforms, the subsequent calculations are reduced by 40 percent. This is a conservative reduction.

The U.S. Bureau of Labor Statistics details average consumer expenditure by location and income levels. There is no direct budget information for Warren County or the Town of Front Royal. Instead, national data for a budget for household incomes, based on national averages, has been chosen for this calculation. Among the larger expenditures by consumers are over 20± percent for housing and over 25± percent for retail trade, including automobiles.

Consumer expenditures made off-site in Front Royal are translated into economic impacts in the town using multiplier matrices provided for the local area by the U.S. Bureau of Economic Analysis, Department of Commerce. These multipliers capture the round-by-round flows of expenditures in the town initiated by residents at the new homes. There are separate matrices for business receipts, employment, and employee earnings. The items in the consumer budget are multiplied in turn by these expenditure-specific categories in each matrix and summed to give the "ripple effect" of circulation of money through the economy. The ripple effects, plus the original consumer expenditures, equal the total economic impacts of new residents on the Front Royal economy.

Business Receipts

A rule of thumb often used by lenders is that a household can afford a home costing between 2.5 and 5.0 times their annual income. This broad range depends on numerous factors such as other debts, credit score, down payment, interest rates, and additional living costs. Utilizing a conservative ratio of three times the annual income, which is closer to the midpoint of

the suggested range, a household purchasing a $575,990 single-family home (Roanoke model), a $601,990 single-family home (Saint Lawrence model), and a $629,990 single-family home (Corsica model) would require annual incomes of approximately $191,200, $200,660, and $210,000, respectively.

Overall, this calculates to $12.60 million in annual consumer expenditures from the expected residents at full build-out. The ripple, or multiplier effect, will generate another $25.8 million in annual receipts among town businesses, for a total business receipts impact of $38.42 million. These business receipts will form the basis for many tax receipts for the Town of Front Royal from the impacted businesses.

Table 15: Business Receipts, Ashton Green at Build-Out, Front Royal, Virginia
(Constant 2024 Dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Direct Consumer Expenditures	$2,409,120	$5,658,610	$4,536,000	$12,603,730
Indirect Ripple Effect	$4,935,450	$11,592,520	$9,292,680	$25,820,650
Total Business Receipts	**$7,344,570**	**$17,251,130**	**$13,828,680**	**$38,424,380**

Source: RIMS II Modeling System; U.S. Bureau of Economic Analysis

Employment and Earnings

Since there will be no employees on-site at Ashton Green, all employment and employee earnings impacts come from the ripple or multiplier effects on businesses, i.e., employee earnings that support increased business receipts in the town. Over time, approximately 229 new full-time equivalent employment positions will be created from resident expenditures at Ashton Green, with total earnings of over $7.4 million for these employees.

Table 16: Spinoff Employment and Earnings, Ashton Green at Build-Out, Front Royal, VA

Model Type	Employees	Average Wage	Total Earnings
Roanoke	38	$32,413	$1,231,694
Saint Lawrence	106	$32,429	$3,437,474
Corsica	85	$32,448	$2,758,080
Total	**229**		**$7,427,248**

Source: RIMS II Modeling System; U.S. Bureau of Economic Analysis

Off-Site Fiscal Impacts

Table 17 summarizes the revenues and costs to the Town of Front Royal from the off-site impacts of Ashton Green. These impacts primarily stem from $38.42 million in new business receipts in the town, along with estimates of real property and business personal property taxes for a typical commercial operation. It is appropriate to view these impacts as long-term; the projected 229 new employees are unlikely to be immediate or lead to an abrupt expansion of the tax base. However, this should occur over time as part of business growth in the town.

Other tax receipts should begin to accrue as soon as consumers from Ashton Green begin making purchases when the subdivision is fully sold out and the new homes are occupied. In the short term, revenues are expected to start at approximately $38,370, rising to $255,770 as businesses physically expand. Costs are based on adding 229 new employees within the town at a cost to the town of $384 per employee, as detailed in Table 11. With costs amounting to $87,930, the net fiscal benefits from off-site expenditures by Ashton Green residents are estimated to be approximately $167,840.

Table 17: Off-Site Fiscal Impact of Consumer Expenditures by Type, Ashton Green, Front Royal, Virginia
(Constant 2024 dollars)

	Roanoke Model	Saint Lawrence Model	Corsica Model	Ashton Green Total
Annual Revenues for the Town:				
Real Estate Tax	$11,657	$27,160	$21,570	$60,387
Machinery and Tools Tax	$1,960	$4,560	$3,620	$10,140
Retail Sales Tax	$6,820	$15,900	$12,630	$35,350
BPOL Tax	$8,140	$18,980	$15,070	$42,190
Meals Tax	$6,180	$14,410	$11,440	$32,030
Hotel Tax	$3,280	$7,630	$6,060	$16,970
Utility Tax	$3,683	$8,580	$6,820	$19,083
Bank Franchise Tax	$2,300	$5,370	$4,260	$11,930
Motor Vehicles	$1,640	$3,830	$3,050	$8,520
Recordation Tax	$3,700	$8,620	$6,850	$19,170
Total Revenue	**$49,360**	**$115,040**	**$91,370**	**$255,770**
Less Costs to the Town	**-$14,590**	**-$40,700**	**-$32,640**	**-$87,930**
Net Fiscal Benefit to the Town	**$34,770**	**$74,340**	**$58,730**	**$167,840**

Source: RIMS II Modeling System; U.S. Bureau of Economic Analysis; S. Patz & Associates, Inc.

Ashton Green FIA Conclusions

Table 18 summarizes the net tax benefits for the proposed single-family homes at the Ashton Green site. On-site benefits are projected to show a surplus of $239,780, whereas off-site benefits are expected to total $167,840. These figures indicate an annual fiscal surplus of $407,620 for the Town of Front Royal once the new homes are built and occupied. This equates to an average annual net benefits of approximately $3,920 per home.

Table 18: Summary of On-Site and Off-Site Fiscal Impacts of Residential Units, Ashton Green at Build-Out, Town of Front Royal, VA
(Constant 2024 Dollars)

Source of Fiscal Impacts in Town of Front Royal	Impacts On-Site in Town of Front Royal	Impacts Off-Site in Town of Front Royal	Total Fiscal Impacts
Roanoke Model (21 Homes)			
Revenues to the Town	$66,840	$49,360	$116,200
Town Costs	-$21,500	-$14,590	-$36,090
Subtotal	*$45,340*	*$34,770*	*$80,110*
Saint Lawrence Model (47 Homes)			
Revenues to the Town	$155,310	$115,040	$270,350
Town Costs	-$48,000	-$40,700	-$88,700
Subtotal	*$107,310*	*$74,340*	*$181,650*
Corsica Model (36 Homes)			
Revenues to the Town	$123,230	$91,370	$214,600
Town Costs	-$36,100	-$32,640	-$68,740
Subtotal	*$87,130*	*$58,730*	*$145,860*
Ashton Green Total (104 Homes)			
Revenues to the Town	$345,380	$255,770	$601,150
Town Costs	-$105,600	-$87,930	-$193,530
Net Fiscal Benefits	**$239,780**	**$167,840**	**$407,620**

Source: Town of Front Royal; S. Patz & Associates, Inc.

EXHIBIT G

Proffer Analysis

School Proffer Analysis

Ashton Green
Front Royal, Virginia

Prepared for:
Walton Mahon and Chris Hornung
Rappahannock Development Group

April 2024

S. PATZ & ASSOCIATES, INC
REAL ESTATE CONSULTANTS

▪ S. PATZ & ASSOCIATES, INC ▪

▪ REAL ESTATE CONSULTANTS ▪

April 1, 2024

Walton Mahon and Chris Hornung
Rappahannock Development Group
1016 Charles Street
Fredericksburg, VA 22401

Walton and Chris,

This report constitutes our Proffer Analysis for the proposed Ashton Green subdivision, set to be constructed south of Happy Creek Road, near its intersection with Leach Run Parkway in the Town of Front Royal, Virginia. The project entails the construction of 104 single-family homes. All ensuing calculations consider the property's by-right capacity for 82 single-family homes.

Upon accounting for the by-right units, our analysis shows that Ashton Green is anticipated to yield a net increase of ten school-age children at build-out, including four elementary, three middle, and three high school students. These projections derive from the student generation rates adopted by Warren County Public Schools (WCPS). Our analysis identifies sufficient educational capacity for the zoned middle and high schools associated with the Ashton Green site. However, Leslie Fox Keyser Elementary School, the designated school for future elementary-age children from Ashton Green, currently operates above its educational capacity. Thus, adding four elementary-age students necessitates supplementary costs for Warren County.

Per data provided by WCPS, constructing a new elementary school with a capacity of 600 students is estimated to cost $29.9 million. Of note is that these figures are estimated costs and subject to change in the future as the school has not yet been designed, and there is no set construction timeline. Nevertheless, this equates to a cost of $49,790 per student or $199,160 for four students. The resulting estimated proffer costs related to schools for the proposed subdivision amount to $1,915 per housing unit. These calculations are predicated on the costs of establishing a new public elementary school to mitigate overcapacity at Leslie Fox Keyser Elementary School.

The attached report presents all detailed data supporting our findings and conclusions. Please call if additional data or clarification are needed.

Sincerely,

Ariel Goldring

Ariel Goldring
President

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Section I: Introduction

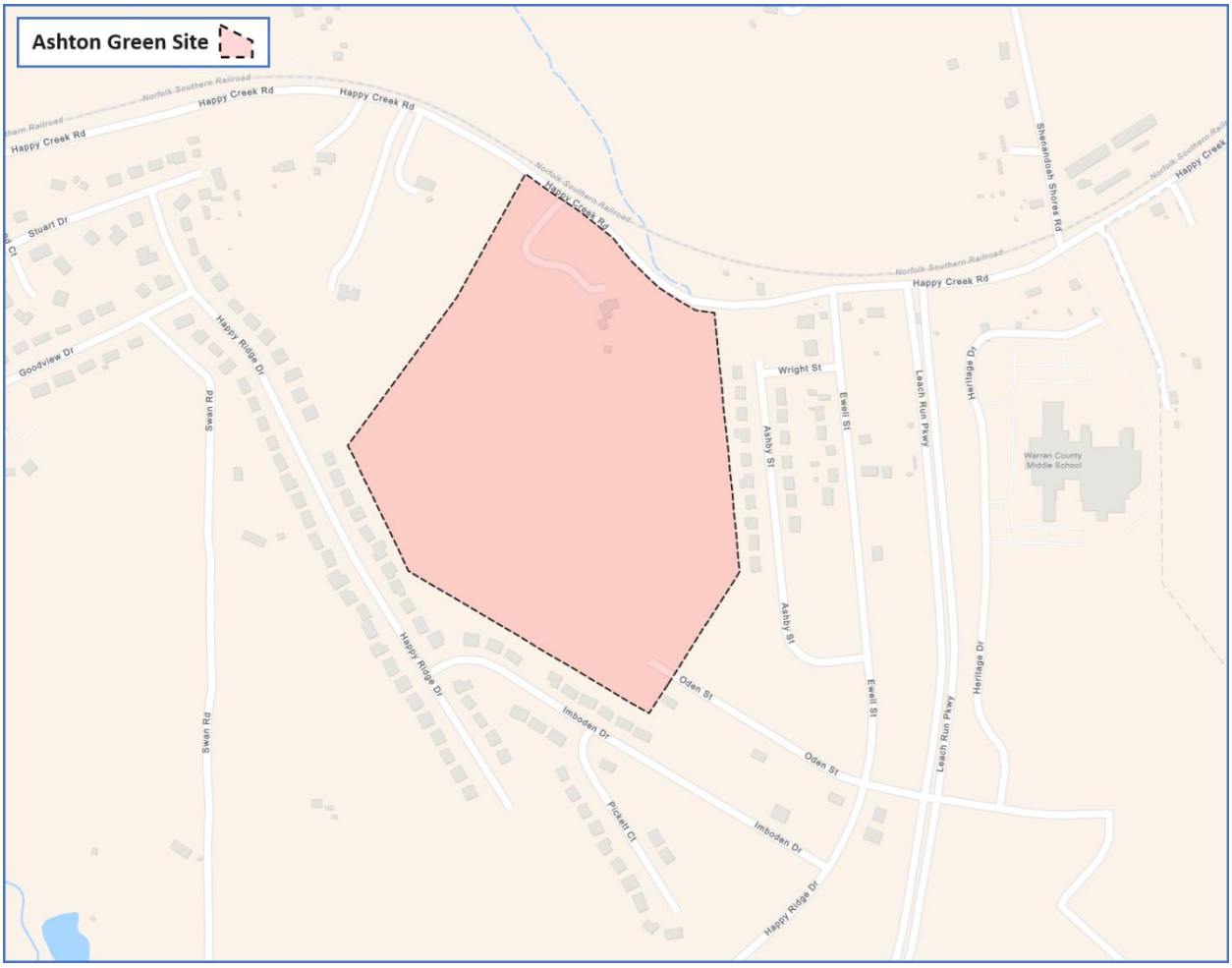
The following report presents the calculation of the recommended proffer costs associated with the proposed Ashton Green development, focusing on its impact on Warren County Public Schools. Situated near the southwestern intersection of Happy Creek Road and Leach Run Parkway in the Town of Front Royal, Virginia, the 41.1-acre property is currently zoned as R-S (Suburban Residential). This classification permits a maximum by-right yield of 82 single-family homes. The development program for Ashton Green involves rezoning the property to R-1 (Medium Density Single-Family), enabling the development of 104 single-family homes and representing a net increase of 22 homes over the by-right total. This difference serves as the baseline for calculating the Ashton Green development's impacts on Warren County Public Schools.

The report to follow is structured in two sections. The first section, the Introduction, analyzes the Ashton Green site's location and development program. The second section, the School Proffer Analysis, calculates the capital costs of new school facilities required for the development's residents upon build-out. Recent state statutes mandate that no new development should be subjected to unreasonable proffers, nor should any development proposal be dismissed based on the application of unreasonable proffer guidelines.

Ashton Green

Site Description

Map A displays the Ashton Green development site's location within the eastern section of the Town of Front Royal. The site comprises an irregularly shaped parcel covering approximately 41.109 acres on the southern side of Happy Creek Road, near its intersection with Leach Run Parkway. The Ashton Green site is situated approximately 2.5 miles east of Downtown Front Royal, a mile from Warren Memorial Hospital, and less than six miles southeast of the Walmart- and Lowe's-anchored Riverton Commons and the Target-anchored Crooked Run Center.

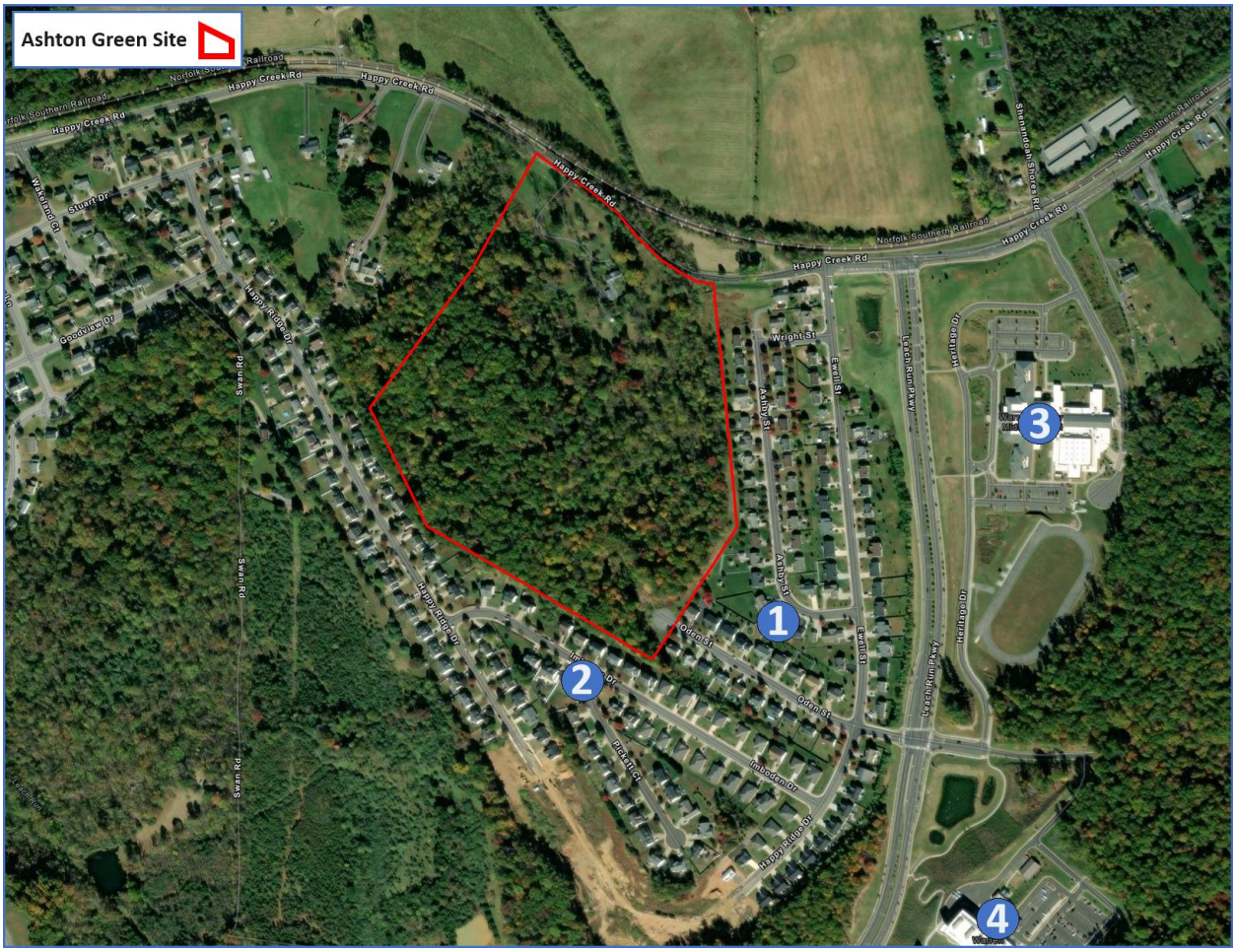


Map A – Site Location

The following is a northern aerial view of the study site. The site is depicted as large with a generally flat topography. It is primarily vacant and wooded, apart from a four-bedroom single-family home constructed in 1969. Happy Creek Road to the north and Oden Street to the southeast facilitate access to the site.

The aerial view shows the site's proximity to various land uses, none of which are expected to impact the proposed development negatively. Directly east of the site are the Oden Ridge (Note 1) and Happy Creek Knolls subdivisions (Note 2). These areas, primarily developed starting in the early 2000s, feature recent home sales prices ranging from the mid-$300,000s to $500,000s. These are attractive subdivisions comprised of well-maintained single-family homes.

To the east of the Ashton Green site, on the east side of Leach Run Parkway, is Warren County Middle School (Note 3), which would serve future school-aged children at the property. The expansive Warren Memorial Hospital is further south along Leach Run Parkway (Note 4). This is a roughly 17,000-square-foot, three-story acute-care hospital that opened in the summer of 2021. It includes 36 private patient rooms, 18 emergency beds, six observation beds, three operating rooms, and one cardiac catheterization lab. The 150-acre campus provides space for future expansion phases. It replaced an older hospital that was built off Shenandoah Avenue in the early 1950s.

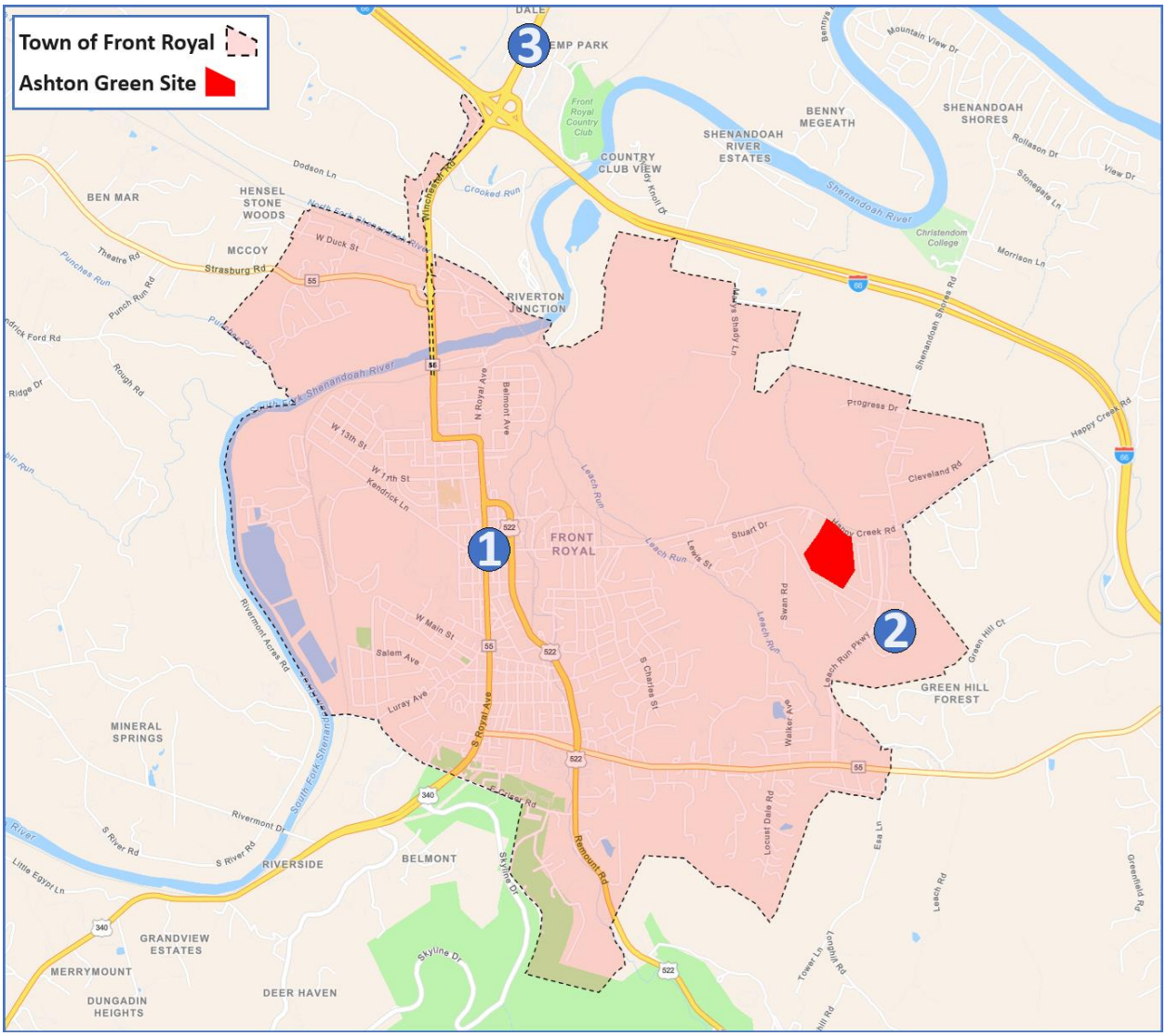


Northern Aerial

Map B depicts the Ashton Green setting within the Town of Front Royal. It illustrates the site's proximity to the intersection of Leach Run Parkway and Happy Creek Road. Leach Run Parkway extends for approximately 1.3 miles between John Marshall Highway in the south and Happy Creek Road to the north. This four-lane, limited-access highway has a 35-mph speed limit and features streetlights, sidewalks on both sides, bicycle lanes, and a median divider. Additionally, the roadway includes intersections controlled by traffic signals at both Happy Creek Road and John Marshall Highway.

Both Happy Creek Road and John Marshall Highway provide access to Downtown Front Royal (Note 1), approximately three miles west of the study site. Downtown hosts a diverse mix of restaurants and retailers, including the nearest grocery store, Martin's. Map B also highlights the proximity of Warren Memorial Hospital (Note 2), a significant local employer.

The third development node shown in Map B is the retail cluster at the intersection of I-66 and Winchester Road (Note 3). This area, which is just outside of the town limits, hosts several big-box retailers, including Target, Walmart, Lowe's Home Improvement, Petco, and Michael's, as well as an Aldi grocery store and various restaurants.



Map B – Site Setting

To summarize, the Ashton Green site is situated in a desirable setting near Downtown Front Royal. It is conveniently located close to the region's employment centers, major roadways, a hospital, and a comprehensive array of retailers and restaurants.

Development Program

The proposed concept plan for Ashton Green is shown below. The site plan illustrates a total of 104 lots, featuring internal roadways that will provide access to each of the single-family home sites. Access to the community will be available from the southeast via Oden Street. Two stormwater management (SWM) ponds are planned for the northern part of the property, fronting Happy Creek Road. Notably, the plan includes an abundance of open and green spaces within the community, with four open space lots proposed.

Ashton Green Concept Plan

Table 1 below outlines the proposed home types to be offered at Ashton Green. The community will feature a total of 104 single-family homes, with an expected mix of 21 Roanoke models, 47 Saint Lawrence models, and 36 Corsica models. Both the Roanoke and Saint Lawrence models will offer at least four bedrooms, with sizes ranging from 2,757 to 3,084 square feet, respectively. The Roanoke models are expected to be listed for between $565,990 and $585,990,

while the Saint Lawrence models are expected to range from $591,990 to $639,990. The Corsica models, being larger, will average 3,371 square feet, include at least three bedrooms, and are projected to be listed for between $619,990 and $639,990. All homes in Ashton Green will feature two levels, two-car garages, and unfinished basements.

Table 1: Proposed Home Characteristics, Ashton Green, Front Royal, Virginia

Product Type	Total Homes	Home Size (Sq. Ft.)	List Prices	Levels	Bed/ Bath	Garage
Roanoke	21	2,757	$565,990-$585,990	2	4+/2+	2+
Saint Lawrence	47	3,084	$591,990-$611,990	2	4+/2+	2+
Corsica	36	3,371	$619,990-$639,990	2	3+/2+	2+
Total	**104**					

Source: Rappahannock Development Corporation

Section II: Proffer Analysis

This section of the report presents the calculation of the recommended proffer costs associated with Ashton Green. The following analysis calculates the development's direct impacts on Warren County Public Schools.

Prior to 2016, officials across all Virginia jurisdictions calculated a proffer cost for new residential developments to account for jurisdictional expenditure in servicing new residents. This was based on actual or projected costs for constructing various public facilities to serve new residents. Since 2016, the onus of calculating proffer costs has transitioned to the project sponsor.

Effective July 1, 2016, Section 15.2-2303.4 of the Code of Virginia (Residential Proffer Legislation), as amended, governs whether proffers apply to a particular residential rezoning or proffer amendment. According to this provision, cash proffers are deemed unreasonable unless they redress direct impacts on designated County public facilities that are directly attributable to the proposed new residential development. More specifically, proffers are limited to public facility enhancements, which include offsite public transportation facility improvements, public safety enhancements, public school augmentations, and public park upgrades.

The methodology for determining suitable proffer costs encompasses an analysis of cost and capacity issues for identified public facilities, focusing on public schools in this case. The student capacity data has been sourced from Warren County Public Schools, while cost data for public schools has been derived from the long-term Capital Improvement Plans (CIP) adopted by the Warren County Public Schools (WCPS), with data confirmed by WCPS staff.

This analysis calculates the impacts of the proposed development of 104 single-family homes for sale at the Ashton Green site, considering the 82 homes that could be built by-right under current zoning conditions. It recommends proffer costs based on these figures. Our evaluation of capacity totals, directly attributable to the proposed development, is informed by data sourced from Warren County.

School Proffer Analysis

The subsection below offers a detailed analysis of Ashton Green's direct impact on Warren County Public Schools. This includes the elementary, middle, and high schools directly impacted by the growth of school-age children from the Ashton Green development once it is built and occupied.

The analysis methodically reviews the current enrollment figures at each school within the zoning area and projects potential enrollment increases directly linked to the development of Ashton Green. These future student population estimations are grounded in methodologies employed by WCPS. Should it be determined that the projected increase in student numbers surpasses the current capacities of these schools, the analysis proposes mitigation strategies. This methodology involves an assessment of the costs or Capital Improvement Plan (CIP) projections necessary for the construction of new educational facilities to accommodate the Ashton Green subdivision.

Capacity and Current Enrollment at Zoned Schools

Table 2 presents student enrollment trends at WCPS over the past five years. Warren County operates nine public schools, consisting of five elementary schools (A. S. Rhodes, E. Wilson Morrison, Leslie Fox Keyser, Ressie Jefferies, and Hilda J. Barbour), two middle schools (Warren County Middle School and Skyline Middle School), and two high schools (Warren County High School and Skyline High School). Additionally, Warren County runs the Blue Ridge Technical Center, which offers hands-on, career-oriented classes for students in grades 9-12.

Trend data show that WCPS enrolled 5,136 students during the 2023-2024 academic year, marking a decrease of 34 students compared to the 2022-2023 academic year and a reduction of 240 students (4.5 percent) over the past five years.

Table 2: Trends in Enrollment, by School, Warren County Public Schools, 2019-2024

	Elementary School					Middle School		High School		Total
School Year	**Rhodes**	**Wilson**	**Barbour**	**Keyser**	**Jeffries**	**Skyline**	**Warren County**	**Skyline**	**Warren County**	
2019-2020	254	468	493	599	578	669	607	887	821	5,376
2020-2021	249	457	458	535	592	619	582	846	822	5,160
2021-2022	268	478	437	523	592	584	558	881	851	5,172
2022-2023	274	449	469	496	639	569	545	894	835	5,170
2023-2024	265	439	470	510	643	579	530	882	818	5,136
Net Change	**+11**	**-29**	**-23**	**-89**	**+65**	**-90**	**-77**	**-5**	**-3**	**-240**
Percent Change	**+4.3%**	**-6.2%**	**-4.7%**	**-14.9%**	**+11.2%**	**-13.5%**	**-12.7%**	**-0.6%**	**-0.4%**	**-4.5%**

Source: Virginia Department of Education (VDOE); Fall Membership Report

The proposed Ashton Green development is located within the attendance zones of Leslie Fox Keyser Elementary School, Warren County Middle School, and Warren County High School. Data in Table 2 above show that enrollment at each of these schools has declined over the past five years, including by 89 students (14.9 percent reduction) at Leslie Fox Keyser Elementary School, 77 students (12.7 percent reduction) at Warren County Middle School, and three students (0.4 percent reduction) at Warren County High School.

Table 3 below presents data on these schools' physical capacity, educational capacity, and current enrollment. As defined by WCPS, physical capacity refers to the student volume a school building can accommodate based on its original design. In contrast, educational capacity refers to the number of students a school can support given its existing instructional programming. WCPS considers schools exceeding their educational capacity as overcrowded and above acceptable thresholds.

Upon assessing the educational capacity, Table 3 shows that current enrollment at Leslie Fox Keyser Elementary School exceeds its educational capacity by 16 students. However, both Warren County Middle School and Warren County High School are significantly below their educational capacities by 270 and 282 students, respectively.

When comparing current enrollment with physical capacity, all three schools are under their physical capacity limits. Leslie Fox Keyser Elementary School, Warren County Middle School, and Warren County High School have excess capacities of 96, 270, and 538 students, respectively. Nonetheless, WCPS does not regard physical capacity as the metric for determining overall capacity.

Table 3: Physical and Educational Capacity, Schools to Serve Future School-Age Children at Ashton Green, April 2024					
	Physical Capacity	Educational Capacity	Current Enrollment	Excess Physical Capacity	Excess Educational Capacity
Leslie Fox Keyser Elementary	606	494	510	96	-16
Warren County Middle	800	800	530	270	270
Warren County High	1,356	1,100	818	538	282
Source: Warren County Public Schools					

In projecting the impacts on public school facility improvements, S. Patz & Associates analyzed the student generation rates used by WCPS staff. These rates are generally consistent with other student generation rates in comparable communities in this part of Virginia. Each student generation rate is individually calculated, considering the school type (elementary, middle, and high school) and the type of dwelling (single-family home and townhome). Table 4 presents these student generation rates. The compiled data show a combined student generation rate of 0.364 for single-family homes and 0.483 for townhomes.

Table 4: Student Generation Rates by Home Type, Warren County, Virginia				
	Elementary School	Middle School	High School	Total
Single-Family Home	0.152	0.090	0.122	0.364
Townhome	0.224	0.111	0.148	0.483
Source: Warren County Public Schools				

Table 5 presents data on the projected number of school-age children at Ashton Green once it is fully built and occupied. The student generation rates used for these projections are sourced from Table 4. According to the data, the 104 single-family homes in the Ashton Green development are expected to directly contribute 38 new school-age children to WCPS. This rounded figure includes approximately 16 elementary school students, nine middle school students, and 13 high school students.

As previously noted, the Ashton Green property is currently zoned as R-S (Suburban Residential), which permits a maximum by-right yield of 82 homes. Considering the students expected to be generated by the by-right units, Ashton Green is expected to produce an additional nine new students. This includes four elementary school students, two

middle school students, and three high school students, as calculated in Table 3. The figures have been rounded up to the nearest whole number to be conservative.

Table 5: Student Generation Rates at Ashton Green, at Build-Out	
Total	
Number of Units	104
Leslie Fox Keyser Elementary School	
Student Generation Rate	0.152
Projected Elementary School Students	*15.808*
Warren County Middle School	
Student Generation Rate	0.090
Projected Middle School Students	*9.36*
Warren County High School	
Student Generation Rate	0.122
Projected High School Students	*12.688*
Total Student Generation Rate	**0.364**
Total Projected Students (Rounded Up)	**38**
By-Right Total	
Number of Units	82
Leslie Fox Keyser Elementary School	
Student Generation Rate	0.152
Projected Elementary School Students	*12.464*
Warren County Middle School	
Student Generation Rate	0.090
Projected Middle School Students	*7.38*
Warren County High School	
Student Generation Rate	0.122
Projected High School Students	*10.004*
Total Student Generation Rate	**0.364**
Total Projected Students (Rounded Up)	**30**
Net Projection of Students (Rounded Up)	
Number of Units (Net)	**22**
Projected Elementary School	**4**
Projected Middle School	**2**
Projected High School	**3**
Total Projected Students	**9**
Source: Warren County Public Schools; Rappahannock Development Group	

Table 6 contrasts the projected number of future school-age children at the three zoned public schools with the current educational capacity. The data show that the projected addition of four students at Leslie Fox Keyser Elementary School will exceed its existing educational capacity. However, given the residual educational capacity at Warren County Middle School and Warren County High School, the anticipated five new students for these schools will not surpass the physical educational capacities set by Warren County Public Schools.

These findings indicate that Ashton Green will need to allocate funds to expand the elementary school's educational capacity by an additional four students to accommodate future students resulting from its direct impacts.

Table 6: Comparison of Physical and Educational Capacity, Schools to Serve Future School-Age Children, Ashton Green, April 2024

	Educational Capacity	Current Enrollment	Additional Students from Ashton Green	Enrollment w/ Ashton Green	Excess Educational Capacity	Direct Educational Capacity Over Enrollment
Leslie Fox Keyser Elementary	494	510	4	514	-20	-4
Warren County Middle	800	530	2	533	267	0
Warren County High	1,100	818	3	821	279	0
Total						**-4**

Source: Warren County Public Schools

Costs of Public Schools

Leslie Fox Keyser Elementary School, originally built in 1976 and later expanded in 1988 and 1993, spans approximately 60,680 square feet and has an educational capacity of 494 students. Currently, the school's enrollment exceeds this capacity by 20 students. Table 6 above projects that the Ashton Green development will introduce an additional four students to the elementary school, factoring in potential by-right homes. Interviews with WCPS staff have confirmed that there are no plans to expand the school's capacity, although renovations are planned.

To manage future enrollment growth, WCPS has long-term plans for a new elementary school to serve the Ashton Green area. While there is no definitive timeline for this project, WCPS staff's most recent estimate puts the cost at approximately $29.9 million for a facility that can accommodate up to 600 students. Based on current institutional construction costs verified by WCPS and staff interviews, this amounts to $49,790 per student. These cost estimates are detailed in Table 7 below.

Table 7: Derivation of Costs for New Elementary School, Warren County, Virginia, April 2024			
	New County Costs	School Capacity	Cost per Student
Land Acquisition	$294,000	600	$490
Architecture & Engineering	$1,785,000	600	$2,975
Construction	$25,500,000	600	$42,500
Furniture, Fixtures, and Equipment (FF&E)	$2,295,000	600	$3,825
Total Cost	**$29,874,000**	**600**	**$49,790**
Source: Warren County Public Schools			

Final School Proffer Calculation

As previously noted, the Residential Proffer Legislation mandates that proffers should only address needs that exceed existing capacity. Proffers are determined based on the projected needs arising from an increase in student numbers beyond those permitted by-right. Thus, Ashton Green is required to account only for the additional four students at the elementary school level, considering the significant surplus in educational capacity at Warren County Middle School and Warren County High School.

The total costs to augment this capacity are estimated at approximately $199,160, based on a cost of $49,790 per student, as calculated in Table 7. For the 104 homes, this translates to $1,915 per unit. This amount could be considered as a cash proffer from Ashton Green to cover the costs of school facilities.

Table 8: Derivation of Costs for New Elementary School, Warren County, VA, April 2024	
	Elementary School
Excess Student Enrollment	4
Cost per Student	$49,790
Total Costs	$199,160
Dwelling Units	104
Cost per Dwelling Unit	**$1,915**
Source: Warren County Public Schools	

EXHIBIT H

Draft Proffer Statement

PROFFER STATEMENT

REZONING:	RZ# 2400___ Suburban Residential (R-S) to Residential District (R-1)
PROPERTY:	42.99 Acres +/-; Tax Map Parcel 20-A-212-4 (the “Property”)
RECORD OWNER/ APPLICANT:	Rappahannock HC, LLC (the “Owner”)
ORIGINAL DATE OF PROFFERS:	April 3, 2024
REVISION DATE(S):	_____

The undersigned Owner hereby proffers that the use and development of the above referenced parcel, which is requested to be rezoned, shall be in substantial conformance with the following conditions, which shall supersede all other proffers on the Property that may have been made prior hereto. In the event the above referenced R-1 conditional rezoning is not granted as applied for by the Owner, these proffers shall be deemed withdrawn and shall be null and void. Further, these proffers are contingent upon final rezoning of the Property with "final rezoning" defined as that rezoning which is in effect on the day following the last day upon which the Town Council of the Town of Front Royal, Virginia (the "Town Council") decision granting the rezoning may be contested in the appropriate court. If the Town Council's decision is contested, and the Owner elects not to submit development plans until such contest is resolved, the term rezoning shall include the day following entry of a final court order affirming the decision of the Town Council which has not been appealed, or, if appealed, the day following which the decision has been affirmed on appeal.

The headings of the proffers set forth below have been prepared for convenience or reference only and shall not control or affect the meaning or be taken as an interpretation of any provision of the proffers. The improvements proffered herein shall be provided at the time of development of that portion of the Property adjacent to or including the improvement or other proffered requirement, unless otherwise specified herein. Any proffered conditions that would prevent the Owner from conforming with State and/or Federal regulations shall be considered null and void. The term "Owner" as referenced herein shall include within its meaning all future owners and successors in interest.

Each proffer made in connection with this application was made voluntarily and complies with applicable law. Each proffer is reasonably related both in nature and extent to the impacts of the proposed development. No agent of the Town of Front Royal, Virginia has suggested or demanded a proffer that is unreasonable under applicable law.

1. Land Use

1.1 Owner shall develop the Property will be developed in conformance with the Ashton Green Rezoning Concept Plan dated March 7, 2024 ("Concept Plan") which is attached hereto and is incorporated herein by reference as "Exhibit A." Notwithstanding the foregoing, all parcel lines, parcel and lot sizes, building envelopes, building or home sizes, public road locations, private driveways, utility locations, storm water management facilities, amenities, waste facilities, and dimensions of undeveloped areas shown on the GDP may be reasonably adjusted for purposes of the final site or subdivision plans to allow full compliance with local, state and federal agency regulations.

1.2 The Property shall be developed solely for no more than one hundred and four (104) residential single-family detached dwelling units (each individually, a "Unit", and collectively, the "Units") as shown on Exhibit A, and the Property shall not be developed for any other secondary uses allowed under the R-1 District, except for any home occupation and accessory uses authorized under said district.

2. Site Development

2.1 The Property shall be served by public water and sewer which shall be installed by the Owner and dedicated to the Town. Owner shall be responsible for the cost of the construction of the aforementioned public water and sewer.

2.2 Owner shall install appropriate storm water management facilities on the Property including a storm water retention pond. The pond shall be located in the open space which shall be conveyed to the future homeowners' association for the subdivision. The homeowners' association shall be responsible for the maintenance of the pond. Owner shall be responsible for the cost of construction of the aforementioned facilities.

2.3 A portion of the Property shall be reserved as open space as depicted on Exhibit A. Such open space shall be conveyed to and maintained by the future homeowners' association (HOA) for the subdivision constructed on the Property.

2.4 Owner may install an entrance feature along Oden Street as depicted on Exhibit A, all at the discretion of the Owner. Once installed, the entrances feature shall be maintained by the HOA.

2.5 Owner shall install a tot lot, consisting of a minimum of playground equipment and benches, within the open space provided for in Paragraph 2.3 above, prior to the issuance of the certificate of occupancy permit (whether temporary or final) for the seventy-fifth (75th) Unit. The tot lot equipment shall be equal or better than the equipment identified on Exhibit B. Once installed, the playground and equipment shall be maintained by the HOA.

2.6 Owner shall install a board-on-board fence along the common property boundary with residential lots within the Oden Ridge and Happy Creek Knolls subdivisions as shown on Exhibit A. The fence shall be constructed with each home along the common property boundary and shall be within an easement to the HOA and shall be maintained by the HOA.

3. Transportation

3.1 The roads within the subdivision on the Property shall be public, constructed to Town or VDOT standards, as appropriate, dedicated to the Town and maintained by the Town. Owner shall be responsible for the cost of construction of the aforementioned roads and other public features, including, but not limited to, sidewalks.

3.2 Owner shall dedicate right-of-way along Happy Creek Road for the Project's entrance improvements. Further, Owner shall dedicate fee simple right-of-way along Happy Creek Road, to include the limits of the existing prescriptive right-of-way, and additional right-of-way needed for the future widening of Happy Creek Road, upon request and at no cost to the Town,

4. Homeowners' Association

4.1 Owner shall create an HOA to maintain the open space areas of the Property, entrances feature, playground, fence and the storm water management facilities constructed on the Property.

5. Cash Proffers

5.1 The Owner voluntarily proffers to make a payment of Five Thousand Dollars and no cents ($5,000.00) per Unit to the Town at the time of the issuance of each Certificate of Occupancy for each single-family detached residence. Said funds shall be used to address public school, parks, and/or transportation needs, all at the discretion of the Town of Front Royal. Cash proffers provided below are applicable to all Units and will be paid on a per Unit basis of $5,000.00 x 104 Units for a total of $520,000.00:

Category	**Schools**	**Other**	**Total**
Per Unit Cash Proffer	$1,915.00	$3,085.00	**$5,000.00**
Total Units	104	104	104
Total Proffer	**$199,160.00**	**$320,840.00**	**$520,000.00**

5.2 Commencing five (5) years after the approval of this rezoning application, the cash proffers for each Unit shall be adjusted annually on January 1st to reflect any increase for the preceding year in the Consumer Price Index, U.S. City Average, All Urban Consumers (the "CPI-U") prepared and reported monthly by the U.S. Bureau of Labor Statistics of the United States Department of Labor. The adjustment shall be made by multiplying the cash contributions for the preceding year by the CPI-U as of December 1st in the preceding year. If the CPI-U is discontinued by the United States Department of Labor, the Marshall and Swift Building Cost Index formula shall be used as defined by Section 15.2-2303.3b of the Code of Virginia.

[AUTHORIZED SIGNATURES TO FOLLOW]

The Owner makes these Proffers voluntarily, in support of their rezoning application and by our signatures deem them reasonable and appropriate as set out in Virginia Code Section 15.2-2303.4 A.D.1.

WITNESS the following signatures:

OWNER:

Rappahannock HC, LLC, a Virginia limited liability company

By: _____

P. Christopher Hornung, Authorized Signatory

Date: _____

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF _____

The foregoing was subscribed, sworn to and acknowledged before me this ___day of _____, 2024, by P. Christopher Hornung, Authorized Signatory of Rappahannock HC, LLC, a Virginia limited liability company.

_____

Notary Public

Print Name: _____

My Commission Expires:_____

Registration No. _____

[SEAL]

EXHIBIT I

Traffic Impact Analysis

Traffic Impact Analysis

Ashton Green Rezoning

Town of Front Royal, Virginia

April 2, 2024

Prepared for:

Rappahannock Development Group

1016 Charles Street

Fredericksburg, VA 20401

GOROVE SLADE

Transportation Planners and Engineers

Prepared by:

GOROVE SLADE
Transportation Planners and Engineers

1140 Connecticut Ave NW	4114 Legato Road	225 Reinekers Lane	4951 Lake Brook Drive
Suite 1010	Suite 650	Suite 750	Suite 250
Washington, DC 20036	Fairfax, VA 22033	Alexandria, VA 22314	Glen Allen, VA 23060
T 202.296.8625	T 703.787.9595	T 703.721.3044	T 804.362.0578

www.goroveslade.com

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Executive Summary

This report presents the findings of a Traffic Impact Analysis (TIA) conducted for the proposed Ashton Green Rezoning, which is generally situated south of Happy Creek Road, west of Leach Run Parkway, and north of Happy Ridge Drive in Front Royal, Virginia.

This study was developed in accordance with the Virginia Department of Transportation (VDOT) transportation impact analysis guidelines. The document was prepared in accordance with the best professional practice and standards that assess the impact of a proposed development on the transportation system and recommends improvements to lessen or negate those impacts. Traffic Impact analysis involves the evaluation of anticipated roadway conditions with and without the proposed development and recommends transportation improvements to offset both the impacts of the increase in future traffic volumes and the changes in traffic operations due to the development. The analysis assists public officials and developers to balance interrelations between efficient traffic movements with necessary lane access.

Description of Proposed Development

The site is situated on one parcel that can be identified on Warren County Tax Maps with the following Tax Map #: 20A212-4. The property totals approximately 41.11 acres and is currently zoned as R-S (Suburban Residential).

The Applicant is proposing to rezone the property to R-1 (Residential Low Density) in order to construct up to 104 single-family detached units. The proposed development was initially scoped to construct 105 single-family detached units, and, for the purposes of this study, the traffic impact of 105 single-family detached units was analyzed to provide conservative results. The development is anticipated to be complete by 2028.

Access to the site will be provided via an existing full-access entrance on Oden Street and a proposed Right-in-right-out entrance on Happy Creek Road.

Principal Findings and Conclusions

Discussions regarding the study assumptions and relevant background information were held with the Town on March 12, 2024. This scope details the study assumptions and relevant background information discussed in the meetings and correspondence. A copy of the scoping document is included in Appendix A.

The analysis contained herein presents the 2024 Existing Conditions, 2028 Future Conditions without Development, and 2028 Future Conditions with Development.

The analysis presented in this report supports the following assumptions and major findings:

Analysis Components

- 2024 existing peak hour volumes were derived via turning movement counts collected at intersections within the study area on Tuesday, March 5, 2024.
- The trip generation associated with the Site was based on the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition publication.
- Intersection capacity and queuing analyses were performed for all analysis scenarios at the study area intersections during the weekday morning (AM), and weekday afternoon (PM) peak hours. *Synchro*, version 11, was used to analyze the study intersections with results based on the Transportation Research Board's (TRB) Highway Capacity Manual (HCM) methodology and analysis guidelines provided in VDOT's Traffic Operations and Safety Analysis Manual (TOSAM) (version 2). The analysis herein includes the level of service (LOS), delay, and queue length comparisons for the turning movements analyzed.

Analysis Results

2024 Existing Conditions

- Based on the capacity analysis of the 2024 Existing Conditions, the signalized study intersection currently operates at an overall acceptable level of service during the AM and PM peak hours.
- All approaches at all study intersections operate at an acceptable level of service during the AM and PM peak hours.
- Based on the queueing analysis, all turning movements have 95th percentile queue lengths that are accommodated within the available storage length of the turn bays.

2028 Future Conditions without Development

- The background study named *Shenandoah Shores Road Traffic Forecast dated October 2023* has no impact on the traffic volumes.
- Based on the capacity analysis of the 2028 Future Conditions without Development, the signalized study intersection is expected to operate at an overall acceptable level of service during the AM and PM peak hours.
- All approaches at all study intersections are expected to operate at an acceptable level of service during the AM and PM peak hours.
- Based on the queueing analysis, all turning movements have 95th percentile queue lengths that can be accommodated within the available storage length of the turn bays.

2028 Future Conditions with Development

- The proposed development will consist of 105 single-family detached units and is anticipated to generate approximately 78 new trips during the AM peak hour, 104 new trips during the PM peak hour, and 1,055 new daily trips on a typical weekday. The development is anticipated to be complete by 2028.
- Based on the capacity analysis of the 2028 Future Conditions with Development, the signalized study intersection is expected to operate at an overall acceptable level of service during the AM and PM peak hours.
- All approaches at all study intersections are expected to operate at an acceptable level of service during the AM and PM peak hours.
- Based on the queueing analysis, all turning movements have 95th percentile queue lengths that can be accommodated within the available storage length of the turn bays.

Overall Conclusion

Based on the capacity and queueing analysis results, the proposed development will not have a substantial impact on the surrounding transportation and roadway network. Therefore, no improvements are recommended to mitigate the traffic generated by the proposed development.

Introduction

This report presents the findings of a Traffic Impact Analysis (TIA) conducted for the proposed Ashton Green Rezoning, which is generally situated south of Happy Creek Road, west of Leach Run Parkway, and south of Happy Ridge Drive in Front Royal, Virginia.

The Applicant is proposing to rezone the property to R-1 (Residential Low Density) in order to construct up to 105 single-family detached units. The proposed development was initially scoped to construct 105 Single-family detached units, and, for the purposes of this study, the traffic impact of 105 single-family detached units was analyzed to provide conservative results. The development is anticipated to be complete by 2028.

Access to the site will be provided via an existing full-access entrance on Oden Street and a proposed Right-In-Right-Out entrance on Happy Creek Road.

The following tasks were completed as part of this study effort:

- Scoping discussions were held with VDOT and the Town on the parameters of this study as well as any relevant background information on March 12, 2024. A copy of the scoping document is included in Appendix A.
- Existing conditions were observed in the field to verify roadway geometry, pedestrian and bicycle infrastructure, and traffic flow characteristics.
- In order to determine the weekday morning and afternoon peak hour turning movement traffic volumes, traffic counts were conducted on Tuesday, March 5, 2024.
- The 2028 Future Conditions without Development scenario was projected based on the existing traffic volumes, an inherent growth to account for regional growth on the roadway network, approved background developments, and roadway improvements.
- Proposed site traffic volumes were derived based on the methodology outlined in ITE's Trip Generation Manual, 11th Edition, publication and were assigned to the road network based on the agreed-upon direction of approach discussed during the aforementioned scoping meeting.
- The 2028 Future Conditions with Development scenario was projected based on the existing traffic volumes, regional growth, approved background developments, roadway improvements, and plans for the proposed development.
- Intersection capacity and queueing analyses were performed at the study intersections for the 2024 Existing Conditions, 2028 Future Conditions without Development, and 2028 Future Conditions with Development scenarios during the weekday morning (AM), and weekday afternoon (PM) peak hours.
- Intersection capacity and queuing analyses were performed using *Synchro*, version 11, with results based on the Transportation Research Board's (TRB) Highway Capacity Manual, Sixth Edition (HCM 6) methodology and in following VDOT's Traffic Operations and Safety Manual (TOSAM) (version 2).

Sources of data for this study include the Institute of Transportation Engineers (ITE), VDOT, and the office files and field reconnaissance efforts of Gorove Slade.

Background Information: Proposed Development (Site & Nearby)

Site Location and Description of the Parcel

The proposed development is generally situated south of Happy Creek Road, west of Leach Run Parkway, and north of Happy Ridge Drive in Front Royal, Virginia. The proposed development consists of one parcel with the following Tax PIN #: 20A212-4 and a property area of approximately 41.11 acres.

An aerial of the study vicinity of provided in **Figure 1**.

A description of the proposed development is provided in the *Introduction* section of this report.

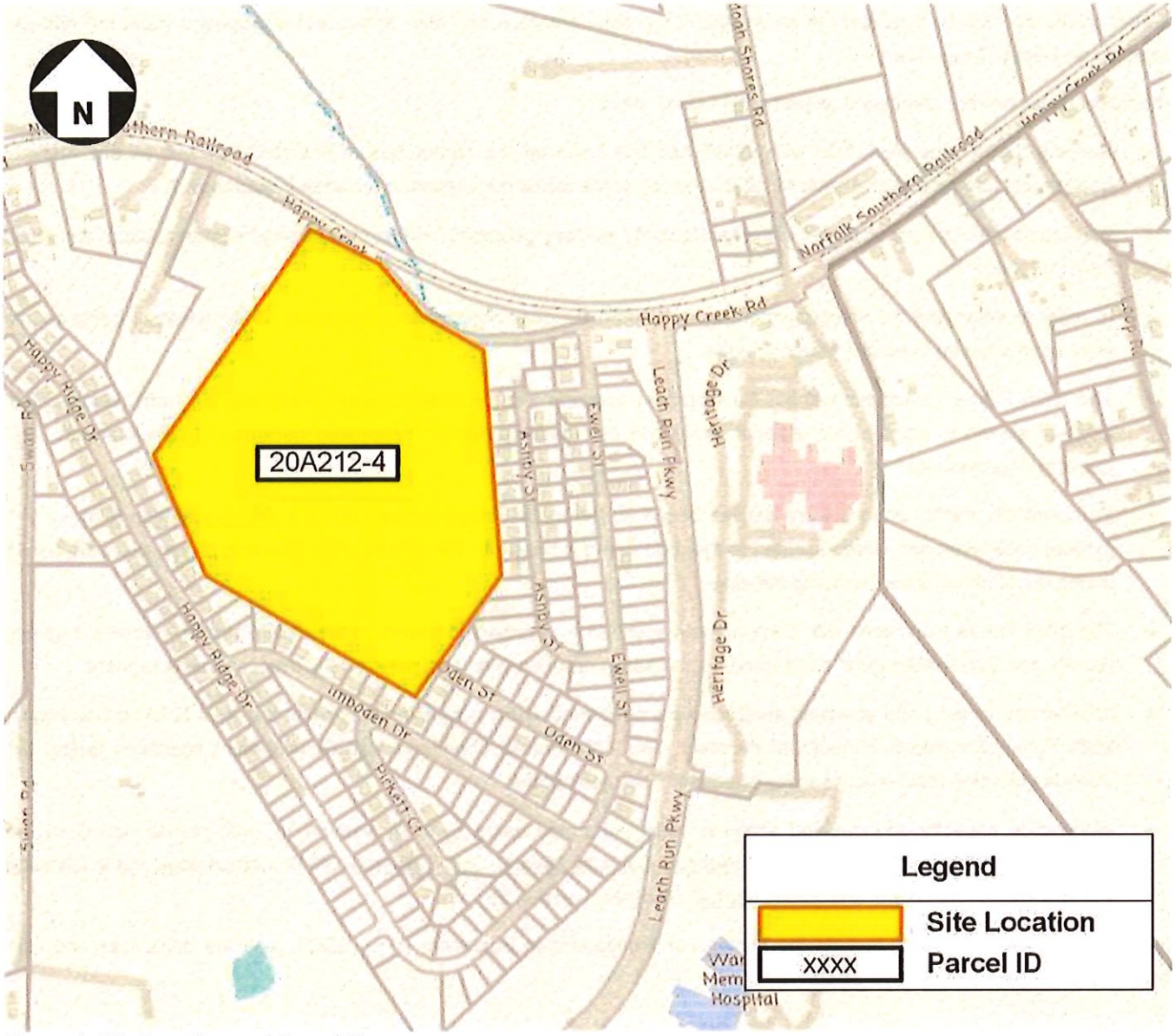


Figure 1: Site Location and Parcel Map

Location within Jurisdiction and Region

The location of the site with respect to the surrounding area is presented in **Figure 2.**

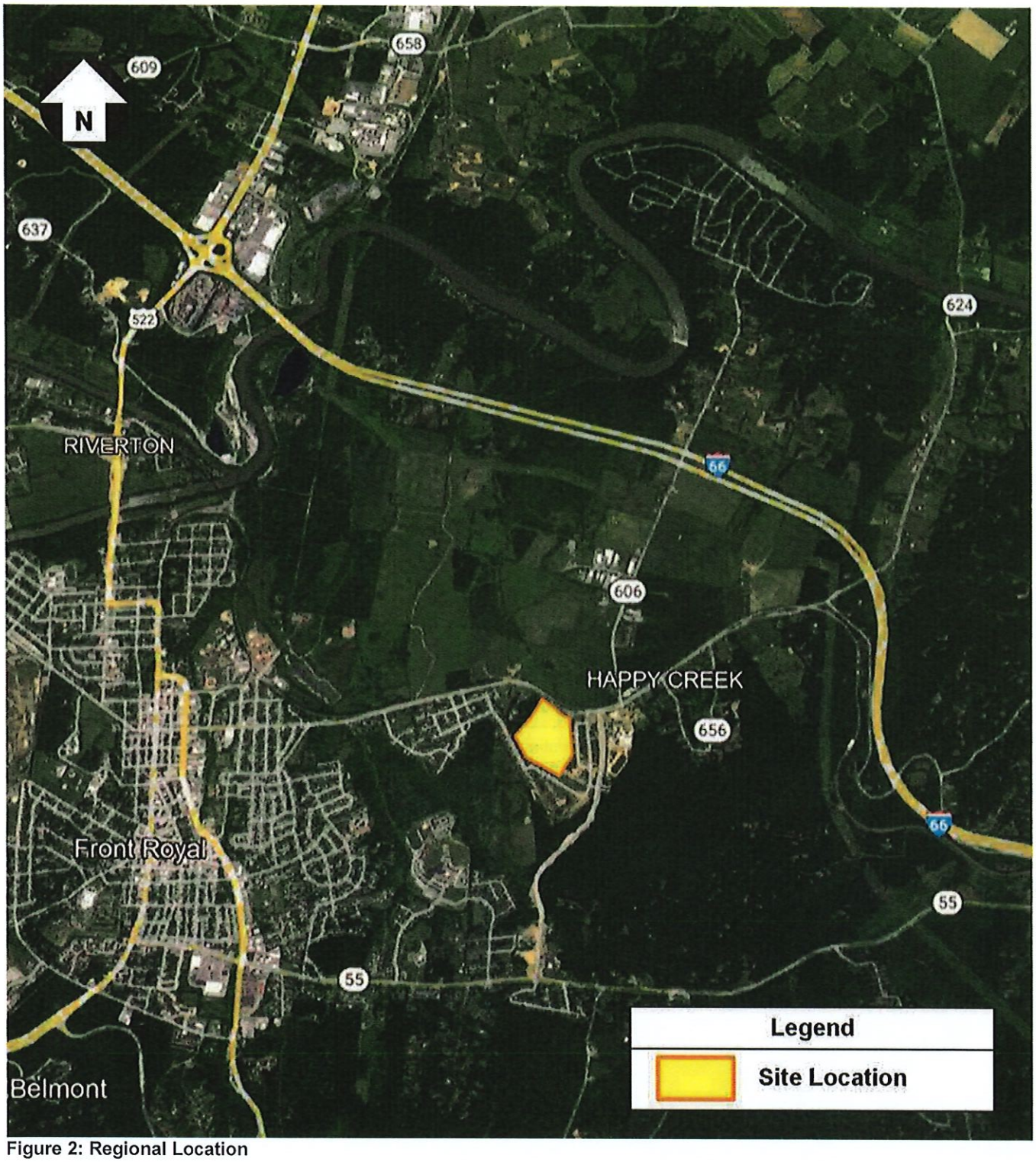


Figure 2: Regional Location

Existing Zoning and Future Land-Use

The Site is currently zoned as R-S (Suburban Residential). The Applicant is proposing to rezone the R-S (Suburban Residential) portion of the parcel to R1 (Residential Low Density).

The existing zoning is presented in **Figure 3**.

Figure 3: Warren County Zoning Map

Descriptions of Geographic Scope of Study and Limits of the Study Area

The geographic scope of the study area was developed in accordance with VDOT and the Town. The vehicular study area includes the following three existing intersections and two future intersections. The study intersections are as follows:

Intersection 1: Happy Creek Road & Leach Run Parkway [Existing full movement, Signalized],

Intersection 2: Leach Run Parkway & Oden Street [Existing full movement, Two-Way Stop Control]

Intersection 3: Happy Creek Road and RIRO Entrance [Proposed Right-In Right Out, Two-Way Stop Control]

Study Intersection 3 provides Right-In-Right-Out access to the development.

An aerial of the study intersections is provided in Figure 4.

Figure 4: Study Intersections

Existing Roadway Network

A description of the major roadways within the study area is presented below in **Table 1**.

Table 1: Existing Roadway Network

Roadway	Route #	VDOT Classification	Route Type	Posted Speed Limit (mph)	AADT (vpd)	Road Segment Between:		k-factor
Happy Creek Rd	SC-642	Major Collector	Secondary Route	35	7825	6th Street	ECL Front Royal	0.1
Leach Run Pkwy		Unclassified	Unclassified	35				
Oden St		Unclassified	Unclassified	25				

*Note: Based on VDOT Historical Traffic Data from 2022. AADT Information not available for Leach Run Pkwy and Oden St

Analysis of 2024 Existing Traffic Volumes

In order to determine the weekday morning (AM) and weekday afternoon (PM) peak hour turning movement traffic volumes, turning movement counts (TMC) were collected at the study intersections on Tuesday, March 5, 2024. The referenced weekday turning movement counts were collected from the hours of 6:00 AM to 9:00 AM and 3:30 PM to 6:30 PM:

- Study Intersection 1: Leach Run Parkway & Happy Creek Road
- Study Intersection 2: Leach Run Parkway & Oden Street/Valley Health Way

- From the turning movement counts, the following system peak hours were determined.
  - AM Peak Hour: 8:00 AM to 9:00 AM
  - PM Peak Hour: 3:30 PM to 4:30 PM

The 2024 existing road network configuration is presented in Figure 5. The existing AM and PM peak hour traffic volumes for the existing study intersections are shown in Figure 6.

The ADT volumes, depicted in Figure 6 and subsequent volume graphics, were calculated based on VDOT published k-factors from 2021, if available, or assumed k-factors per approach of 0.10 and the PM peak hour volumes. The raw existing traffic count data is provided in Appendix B.

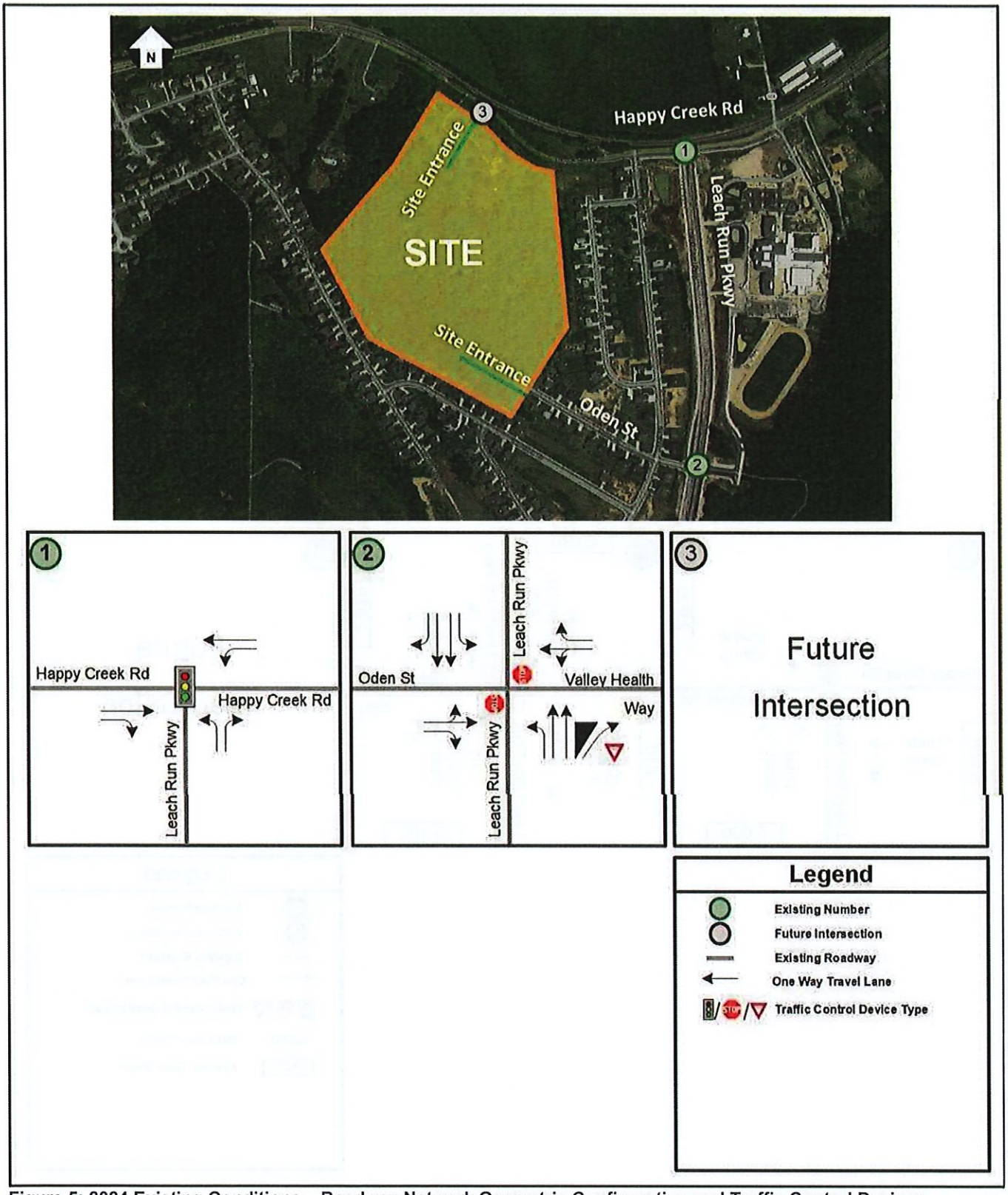


Figure 5: 2024 Existing Conditions – Roadway Network Geometric Configuration and Traffic Control Devices

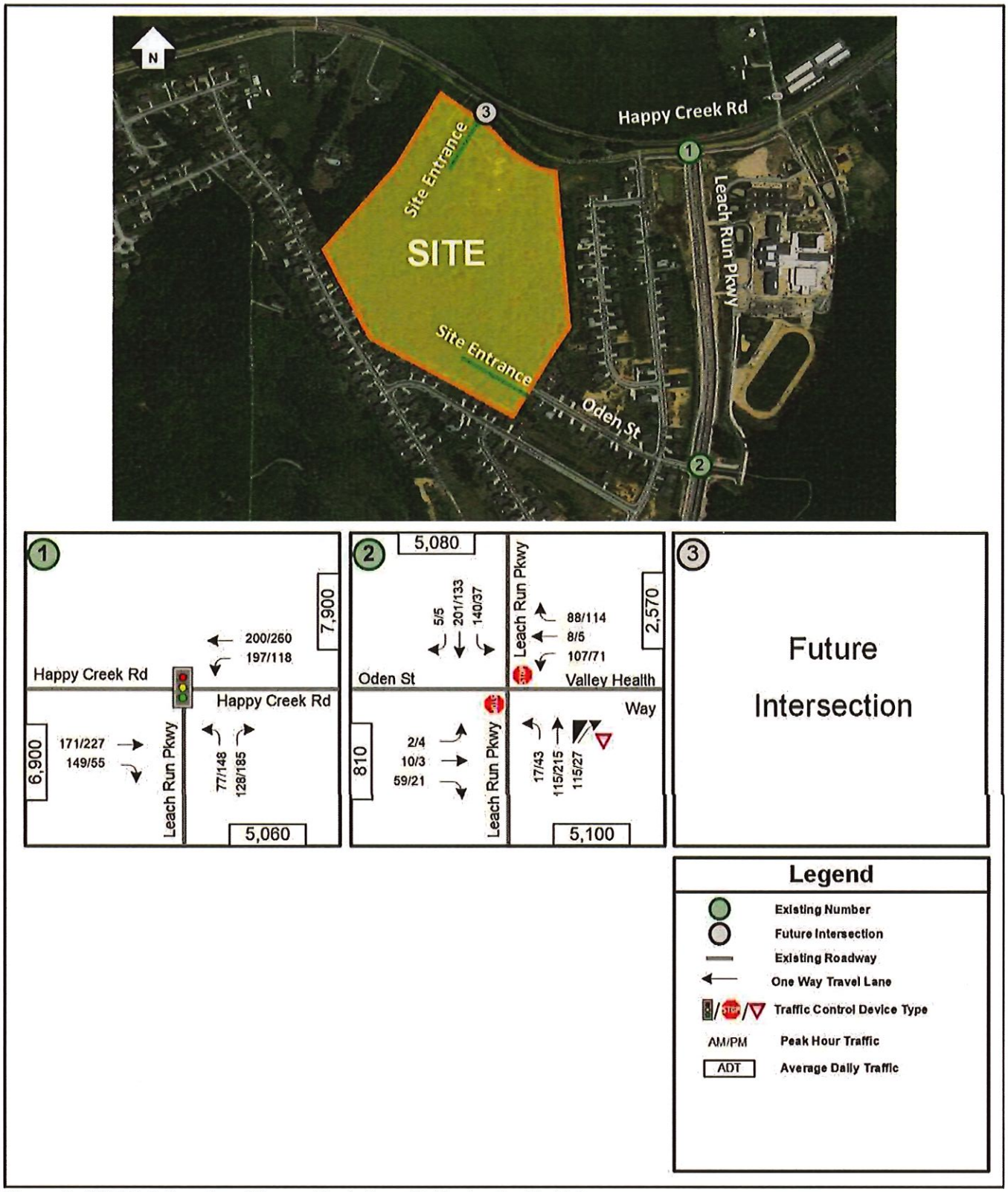


Figure 6: 2024 Existing Conditions – Peak Hour Vehicular Traffic Volumes

Existing Intersection Capacity and Queueing Analysis

Intersection capacity and queuing analyses were performed for the 2024 Existing Conditions scenario at the study area intersections during AM and PM peak hours, in accordance with VDOT's *TOSAM* (version 2) guidelines. *Synchro,* version 11, was used to analyze the study intersections with results based on the Transportation Research Board's (TRB) Highway Capacity Manual (HCM) 6th Edition methodology and include the level of service (LOS), delay, and queue length comparisons for the turning movements analyzed. Lane configurations at study intersections along the road network were field-verified, and the existing traffic volumes discussed in the aforementioned section as well as other relevant data were entered into the analysis models.

For this analysis, the existing peak hour factors (PHF) utilized in the analysis of existing conditions were based on the traffic count data collected and were modeled in the *Synchro* network on a by-intersection basis. PHF in the range of 0.85 to 1.00 was used for the existing scenario, consistent with VDOT analysis guidelines. The heavy vehicle percentages (HV%) utilized per movement were based on existing traffic count data for each lane group.

Per the scoping meeting with VDOT and the Town staff, it would be considered acceptable to achieve an approach LOS D or better for traffic operations, using HCM methodology. The results of the intersection capacity from *Synchro* are presented in **Table 2** and graphically in **Figure 7**. The results are expressed in LOS and delay (seconds per vehicle) for overall signalized/all-way stop control intersections and per approach and lane group for all study intersections.

The 95th percentile queues were also determined from *Synchro* and are expressed in feet.

The description of different LOS and delays are included in Appendix C. The detailed analysis worksheets of 2024 Existing Conditions are contained in Appendix D.

Table 2: 2024 Existing Conditions – Intersection Capacity Analysis Results

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	AM Peak Hour 95th % Queue (ft.)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	PM Peak Hour 95th % Queue (ft.)
			Synchro			Synchro		
1	**Leach Run Pkwy (N/S) & Happy Creek Rd (E/W)**							
	Overall Intersection (Signalized)		**C**	**26.5**		**C**	**26.5**	
	Eastbound Approach		***C***	***29.5***		***C***	***29.5***	
	Eastbound Thru		D	35.7	167	D	35.7	167
	Eastbound Right		C	22.5	36	C	22.5	36
	Westbound Approach		***C***	***21.6***		***C***	***21.6***	
	Westbound Left	250	C	22.4	147	C	22.4	147
	Westbound Thru		C	20.9	147	C	20.9	147
	Northbound Approach		***C***	***31.2***		***C***	***31.2***	
	Northbound Left		D	38.2	89	D	38.2	89
	Northbound Right		C	27.0	22	C	27.0	22
2	**Leach Run Pkwy(N/S) & Oden St/Valley Health Way(E/W)**							
	Overall Intersection (TWSC)							
	Eastbound Approach		***B***	***10.8***		***B***	***10.8***	
	Eastbound Left/Thru		C	17.9	5	C	17.9	5
	Eastbound Right		A	9.3	5	A	9.3	5
	Westbound Approach		***C***	***19.2***		***C***	***19.2***	
	Westbound Left/Thru		D	26.9	58	D	26.9	58
	Westbound Right		A	9.1	10	A	9.1	10
	Northbound Approach							
	Northbound Left		A	7.8	0	A	7.8	0
	Southbound Approach							
	Southbound Left	205	A	7.8	10	A	7.8	10

NOTES:
[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

Based on the capacity analysis, the signalized study intersection is anticipated to operate at an overall acceptable level of service during both peak hours. All approaches at all study intersections operate at an acceptable level of service during all peak hours.

Based on the queuing analysis performed for the 2024 Existing Conditions, all turning movements at the study intersections have 95th percentile queues that are accommodated within the available storage lengths of the turn bays.

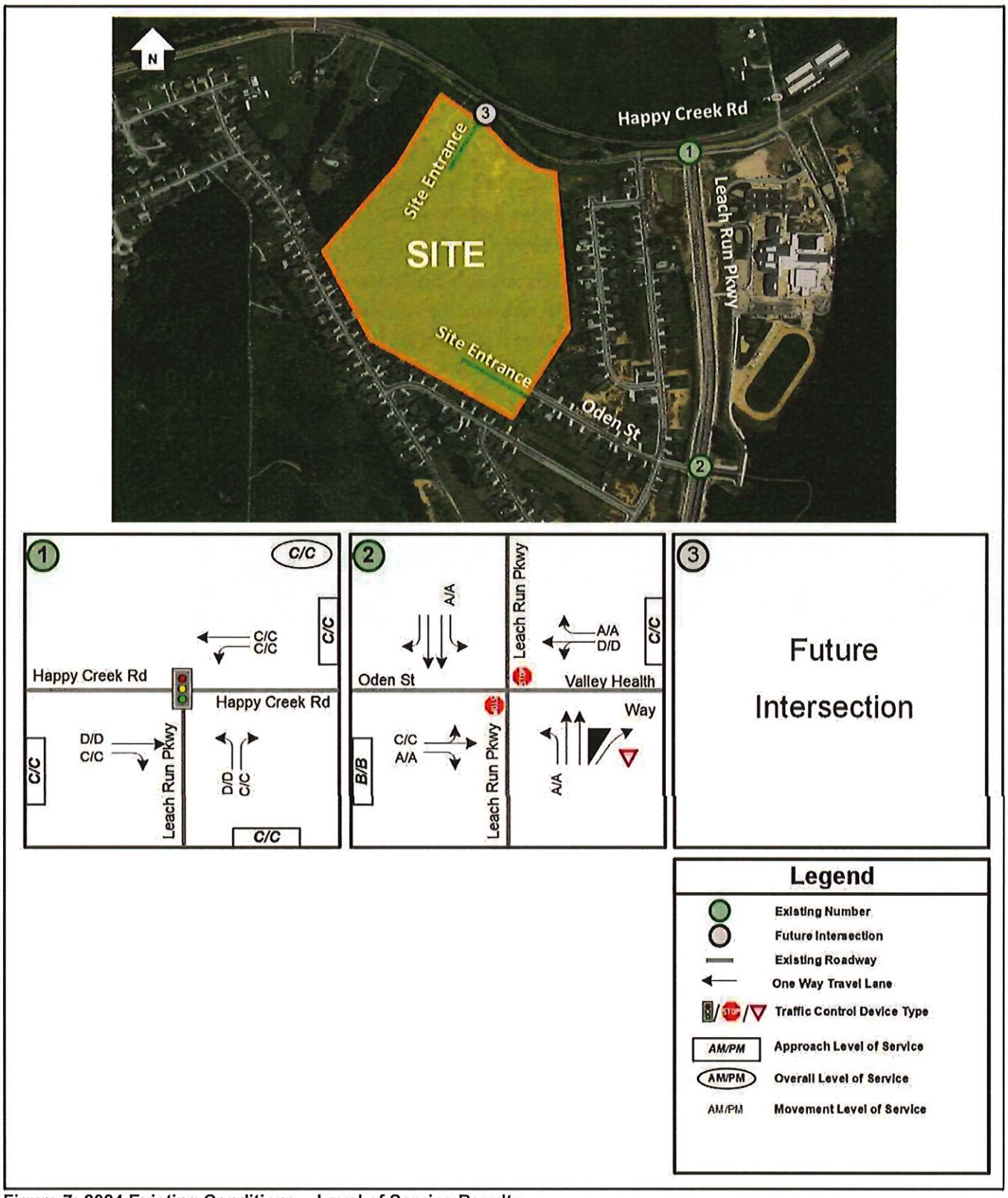


Figure 7: 2024 Existing Conditions – Level of Service Results

Analysis of 2028 Future Conditions Without Development

For this study, the development is anticipated to be constructed by 2028; this scenario analyzes the future without development conditions for the year 2028.

Future without Development Traffic Volumes

The derivation of future without development traffic volumes was based on assumptions and parameters discussed with VDOT during the scoping process for this study. The future conditions include anticipated inherent regional growth, any potential background developments around the vicinity of the site, and any anticipated roadway improvements.

Inherent Regional Growth

In order to account for the increased demand on the traffic network between 2024 and 2028, an inherent growth rate of 1%, (compounded annually) over four years, between 2024 to 2028 (totaling 4.6% growth of the existing volumes) was applied to all the movements at the intersection of Happy Creek Road and Leach Run Parkway. This inherent growth was anticipated to account for regional development within the at-large area, which would ultimately result in increased roadway demand. Furthermore, the inherent growth was anticipated to account for any potential background developments unaccounted for within the vicinity of the study area.

Background Developments

Per scoping meeting, the Shenandoah Shores Road Traffic Forecast dated October 2023 was considered but found to have no impact on the traffic volumes.

Future without Development Traffic Volumes

In order to forecast future roadway traffic volumes for the year 2028, the 2024 existing traffic volumes were combined with the inherent regional growth traffic volumes. The inherent regional growth volumes (for the period between 2024 and 2028) are illustrated in **Figure 8**. The 2028 Future without Development traffic volumes are illustrated in **Figure 9.**

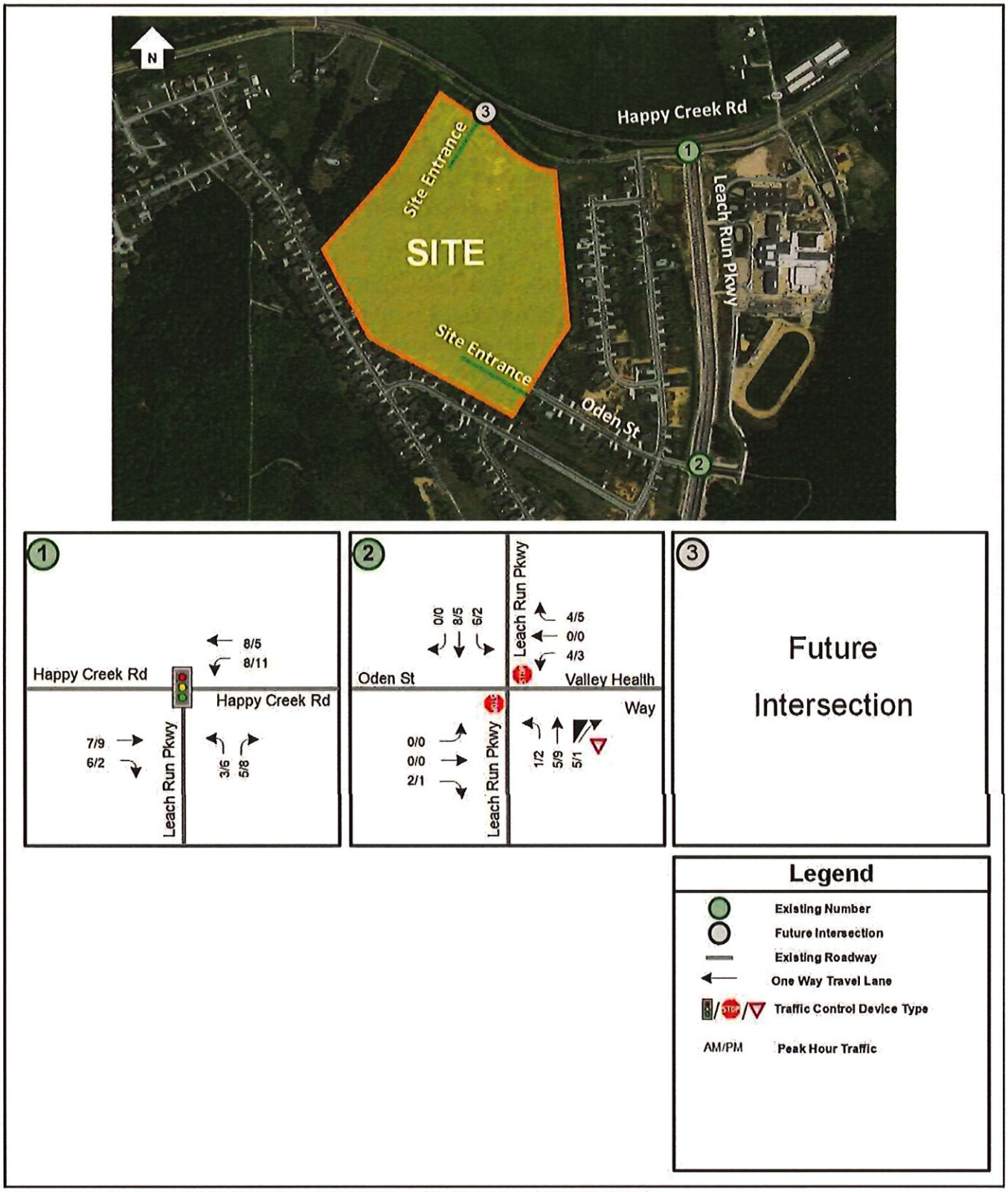


Figure 8: Projected Inherent Regional Growth Traffic Volumes (2024 to 2028)

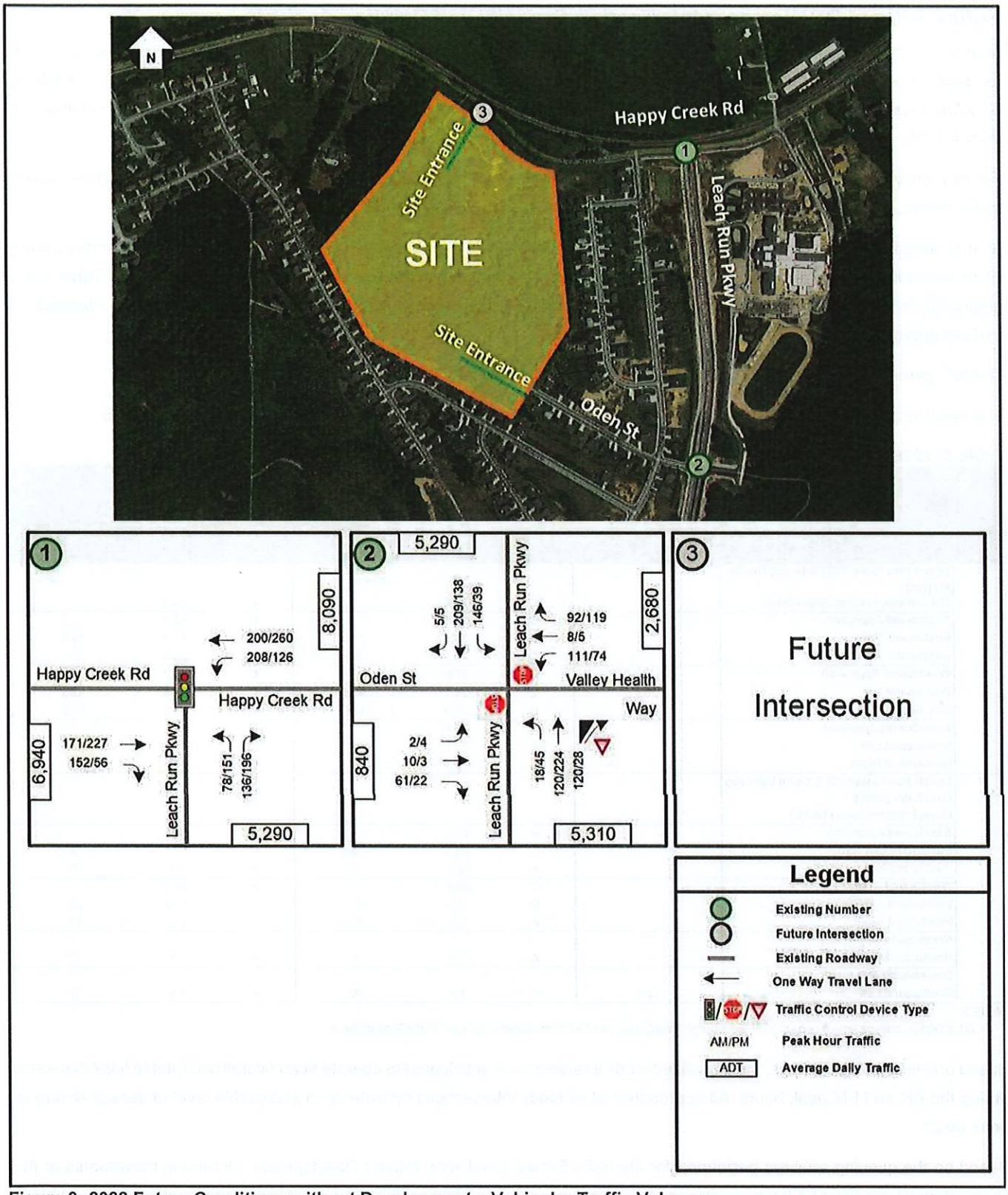


Figure 9: 2028 Future Conditions without Development – Vehicular Traffic Volumes

Future without Development Intersection Capacity and Queuing Analysis

Intersection capacity and queueing analyses were performed for the 2028 Future Conditions without Development scenario at the study area intersections during the AM and PM peak hours, in accordance with VDOT's *TOSAM* (version 2) guidelines. *Synchro,* version 11, was used to analyze the study intersections with results based on TRB's HCM 6th Edition methodology and include LOS, delay, and queue length comparisons for the turning movements analyzed.

For this analysis, the intersection PHF utilized in the analysis of future conditions was determined based on the 2024 existing traffic counts, with a minimum of 0.92. The HV% were based on the existing traffic count data.

As mentioned previously, it would be considered acceptable to achieve an approach LOS D or better for traffic operations using HCM methodology. The results of the intersection capacity and queuing analyses from *Synchro* are presented in **Table 3** and graphically in **Figure 10**. The results are expressed in LOS and delay (seconds per vehicle) for overall signalized intersections and per approach and lane group for all study intersections.

The 95th percentile queues were also determined from *Synchro* and are expressed in feet.

The detailed analysis worksheets of the 2028 Future Conditions without Development are contained in Appendix E.

Table 3: 2028 Future Conditions without Development – Intersection Capacity Analysis Results

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh) Synchro	AM Peak Hour 95th % Queue (ft.)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh) Synchro	PM Peak Hour 95th % Queue (ft.)
1	**Leach Run Pkwy (N/S) & Happy Creek Rd (E/W)**							
	Overall Intersection (Signalized)		C	26.6		C	30.8	
	Eastbound Approach		***C***	***29.5***		***D***	***37.6***	
	Eastbound Thru		D	35.7	167	D	41.8	229
	Eastbound Right		C	22.5	36	C	20.4	21
	Westbound Approach		***C***	***22.0***		***C***	***23.2***	
	Westbound Left	250	C	23.1	156	C	22.6	103
	Westbound Thru		C	20.9	147	C	23.5	204
	Northbound Approach		***C***	***31.1***		***C***	***33.7***	
	Northbound Left		D	38.2	90	D	41.5	165
	Northbound Right		C	27.1	23	C	27.7	25
2	**Leach Run Pkwy(N/S) & Oden St/Valley Health Way(E/W)**							
	Overall Intersection (TWSC)							
	Eastbound Approach		***B***	***10.8***		***B***	***10.3***	
	Eastbound Left/Thru		C	18.6	5	C	15.1	3
	Eastbound Right		A	9.3	8	A	8.8	3
	Westbound Approach		***C***	***20.8***		***B***	***12.8***	
	Westbound Left/Thru		D	29.9	65	C	17.4	23
	Westbound Right		A	9.1	10	A	9.8	15
	Northbound Approach							
	Northbound Left		A	7.9	3	A	7.7	3
	Southbound Approach							
	Southbound Left	205	A	7.8	10	A	7.9	3

NOTES:
[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

Based on the capacity analysis, the signalized study intersection is anticipated to operate at an overall acceptable level of service during the AM and PM peak hours. All approaches at all study intersections operate at an acceptable level of service during all peak hours.

Based on the queuing analysis performed for the 2028 Future Conditions without Development, all turning movements at the study intersections have 95th percentile queues that can be accommodated within the available storage lengths of the turn bays.

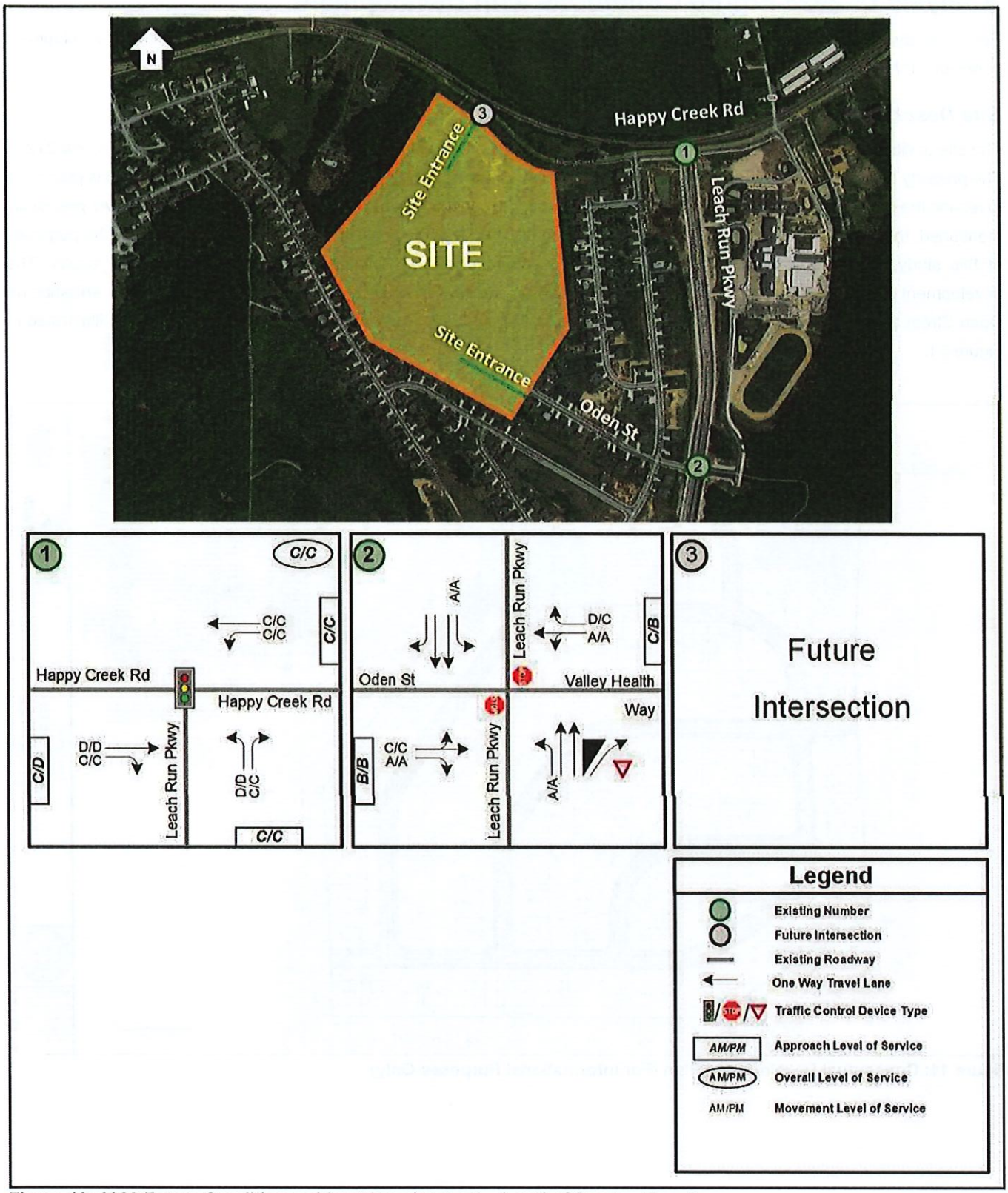


Figure 10: 2028 Future Conditions without Development – Level of Service Results

Analysis of 2028 Future Conditions with Development

For this study, the Development is anticipated to be constructed by 2028 and this scenario analyzes the future with development conditions for the year 2028.

Site Description

The site is situated on one parcel that can be identified on Warren County Tax Maps with the following Tax Map #: 20A212-4. The property totals approximately 41.11 acres and is currently zoned as R-S (Suburban Residential). The Applicant is proposing to rezone the property to R-1 (Residential Low Density) in order to construct up to 104 single-family detached units. As previously mentioned, the proposed development was initially scoped to construct 105 single-family detached units, and, for the purposes of this study, the traffic impact of 105 single-family detached units was analyzed to provide conservative results. The development is anticipated to be complete by 2028. Access to the site will be provided via an existing full-access entrance on Oden Street and a proposed Right-in-right-out entrance on Happy Creek Road. A conceptual plan for the Site is illustrated in Figure 11.

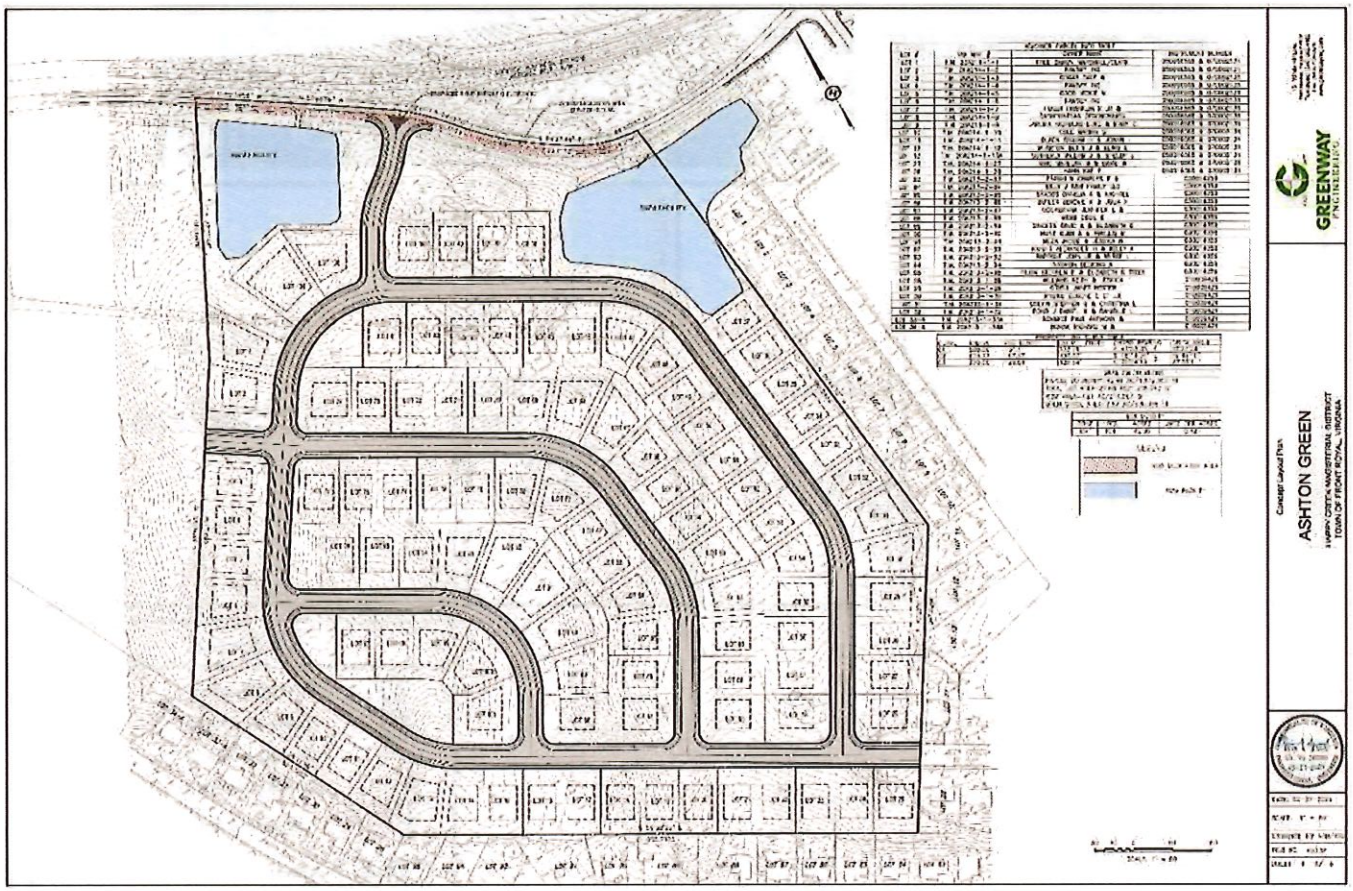


Figure 11: Conceptual Development Plan (For Informational Purposes Only)

Projected Site Trip Generation

In order to calculate the trips generated by the proposed development, the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition, the publication was used to determine the total trips going into and out of the subject study site during the weekday AM and PM peak hours as well as the typical number of weekday daily trips. The projected trip generation for the proposed development is depicted in **Table 4**. There is no internal capture and pass-by allowance reduction associated with this site.

Table 4: Site Trip Generation (Peak Hour of the Adjacent Street; ITE 11th Ed.)

Land Use	ITE Code	Size	Weekday						
			AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	Total
Single-Family Detached Housing (EQUATIONS)	210	105 DU	19	59	78	66	38	104	1,055

As illustrated in the table above, the site in total is expected to generate approximately 78 new trips during the AM peak hour, 104 new trips during the PM peak hour, and 1,055 new daily trips on a typical weekday.

Distribution and Assignment of Site Traffic

The distribution and assignment of the site-generated trips were based on the existing traffic patterns, engineering judgment, and the nature of the proposed development, and with the guidance and input from VDOT and Town staff. The site direction of approach is illustrated in Figure 12.

Future with Development Traffic Volume

In order to project future traffic volumes on the roadways in the vicinity of the development, trips generated from the development were assigned to the road network based on the previously mentioned direction of approach. The primary site traffic assignment is illustrated for the AM and PM peak hours in Figure 13.

The 2028 Future with Development traffic volumes is illustrated in Figure 14.

Figure 12: Direction of Approach (Site Trip)

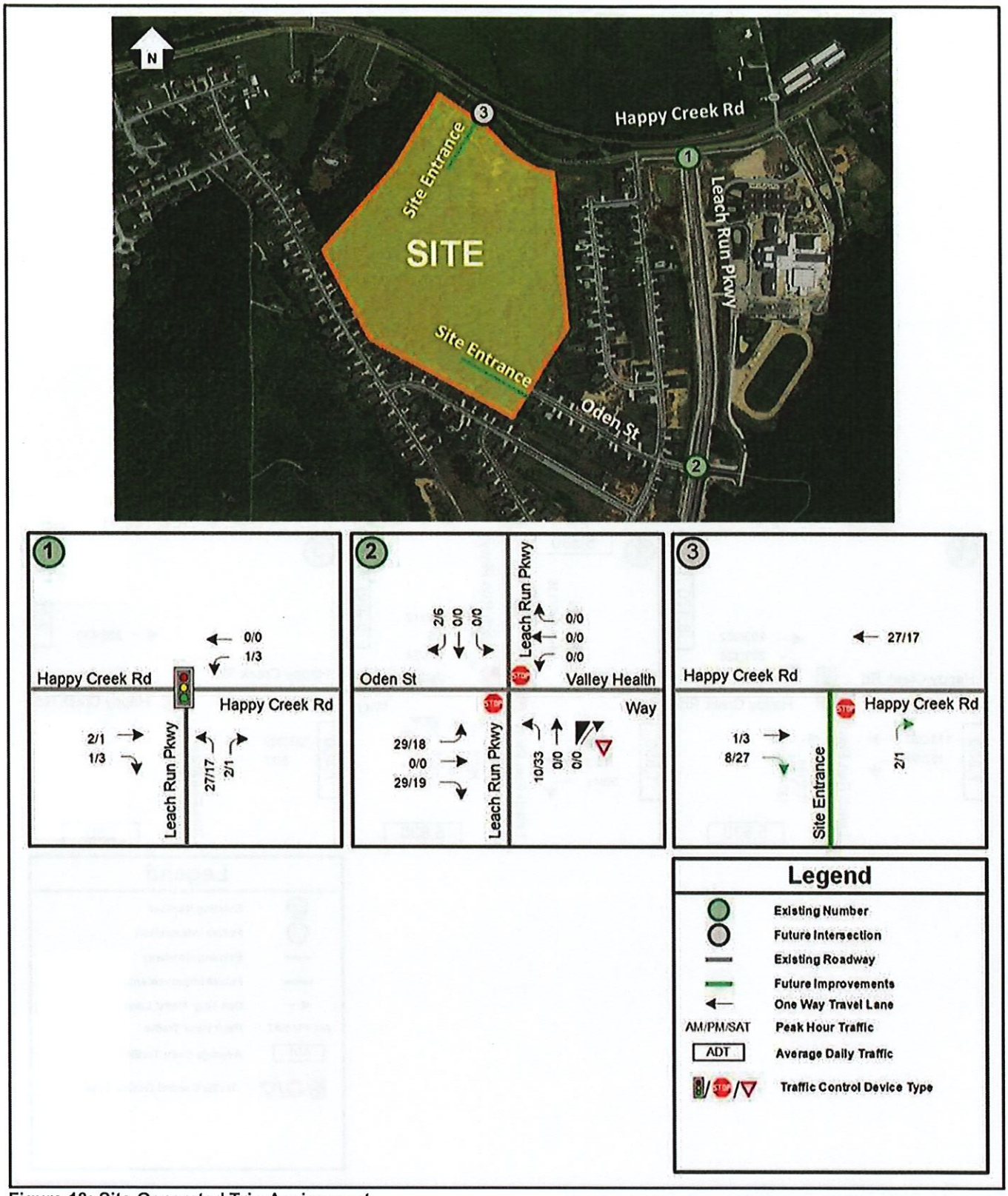


Figure 13: Site Generated Trip Assignment

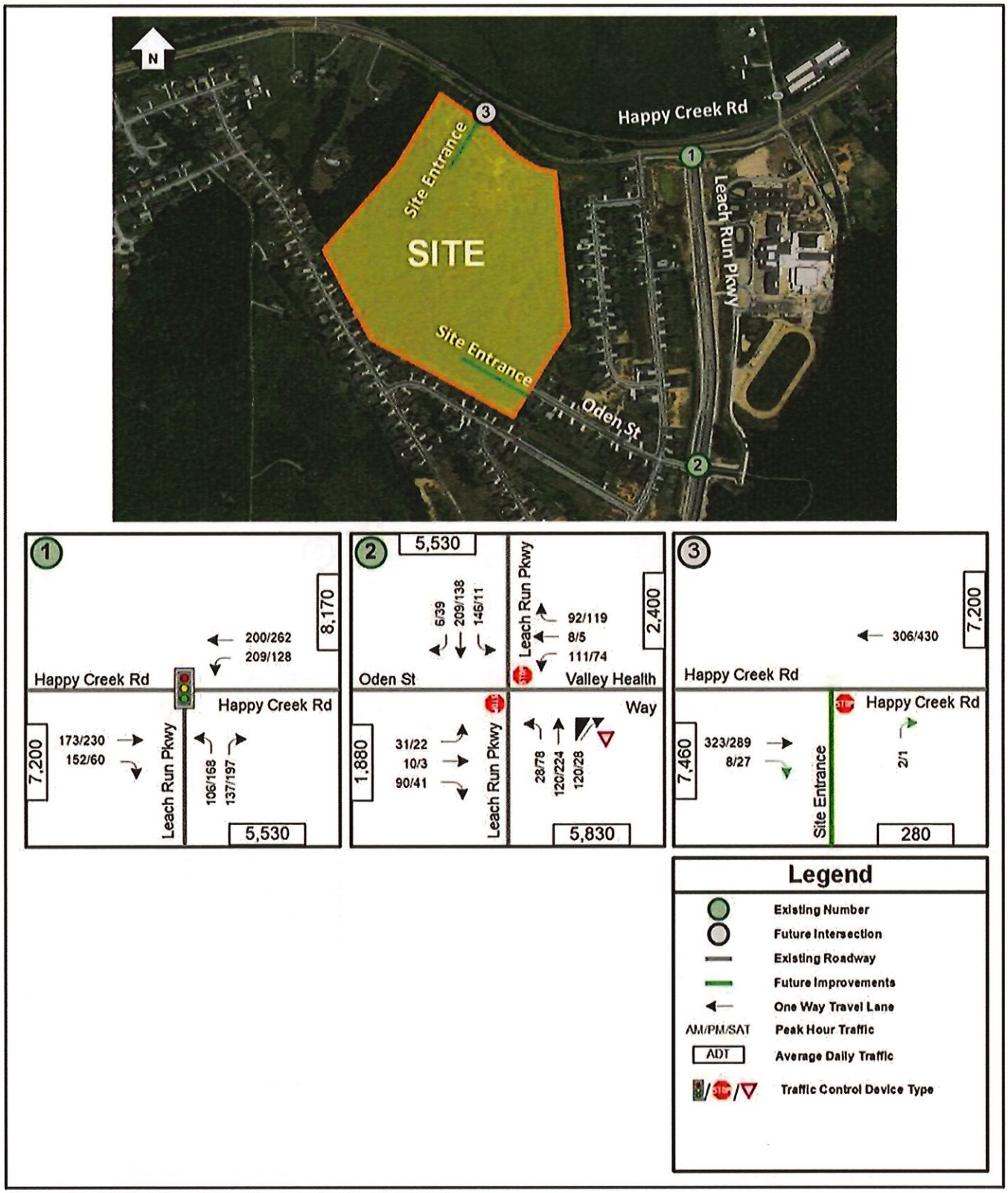


Figure 14: 2028 Future Conditions with Development

Future with Development Intersection Capacity and Queuing Analysis

Intersection capacity and queuing analyses were performed for the 2028 Future Conditions with Development scenario at the study area intersections during the AM and PM peak hours, in accordance with VDOT's *TOSAM* (version 2) guidelines. *Synchro,* version 11, was used to analyze the study intersections with results based on TRB's HCM 6th Edition methodology and include LOS, delay, and queue length comparisons for the turning movements analyzed.

For the purposes of this analysis, the intersection PHF utilized in the analysis of future conditions was determined based on the 2024 existing traffic counts, with a minimum of 0.92 as agreed to in the scoping document. The HV% were based on the existing conditions scenario, with any new approaches based on the existing counts and the Site truck trip generation.

As mentioned previously, it would be considered acceptable to achieve an approach LOS D or better for traffic operations using HCM methodology. The results of the intersection capacity and queuing analyses from *Synchro* are presented in **Table 5** and graphically in Figure 16. The results are expressed in LOS and delay (seconds per vehicle) for overall signalized intersections and per approach and lane group for all study intersections.

The 95th percentile queues were also determined from *Synchro* and are expressed in feet.

The detailed analysis worksheets of the 2028 Future Conditions with Development scenario are contained in Appendix F.

Table 5: 2028 Future Conditions with Development – Intersection Capacity Analysis Results

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	AM Peak Hour 95th % Queue (ft.)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	PM Peak Hour 95th % Queue (ft.)
				Synchro			Synchro	
1	**Leach Run Pkwy (N/S) & Happy Creek Rd (E/W)**							
	Overall Intersection (Signalized)		**C**	**27.5**		**C**	**31.5**	
	Eastbound Approach		***C***	***29.9***		***D***	***38.0***	
	Eastbound Thru		D	36.7	173	D	42.6	239
	Eastbound Right		C	22.1	36	C	20.2	23
	Westbound Approach		***C***	***22.9***		***C***	***23.9***	
	Westbound Left	250	C	24.2	162	C	23.5	110
	Westbound Thru		C	21.6	153	C	24.1	214
	Northbound Approach		***C***	***32.1***		***C***	***34.4***	
	Northbound Left		D	39.0	116	D	42.4	190
	Northbound Right		C	26.8	23	C	27.5	26
2	**Leach Run Pkwy(N/S) & Oden St/Valley Health Way(E/W)**							
	Overall Intersection (TWSC)							
	Eastbound Approach		***B***	***12.9***		***B***	***11.2***	
	Eastbound Left/Thru		C	20.5	15	C	15.1	5
	Eastbound Right		A	9.4	10	A	8.9	3
	Westbound Approach		***C***	***19.3***		***B***	***12.4***	
	Westbound Left/Thru		D	27.2	55	C	16.6	20
	Westbound Right		A	9.1	8	A	9.6	13
	Northbound Approach		***A***	***0.8***		***A***	***1.8***	
	Northbound Left		A	7.8	3	A	7.8	5
	Southbound Approach							
	Southbound Left	205	A	7.8	10	A	7.8	0
3	**Future Site Access (N/S) & Happy Creek Rd (E/W)**							
	Overall Intersection (TWSC)							
	Northbound Approach		***B***	***10.2***		***B***	***10.1***	
	Northbound Right		B	10.2		B	10.1	

NOTES:
[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

Based on the capacity analysis of the 2028 Future Conditions with Development, the signalized study intersection is expected to operate at an overall acceptable level of service during the AM and PM peak hours. All approaches at all study intersections are expected to operate at an acceptable level of service during the AM and PM peak hours.

Based on the queuing analysis performed for the 2028 Future Conditions with Development, all turning movements at the study intersections have 95th percentile queues that can be accommodated within the available storage lengths of the turn bays.

Therefore, no improvements are recommended to mitigate the traffic generated by the proposed development.

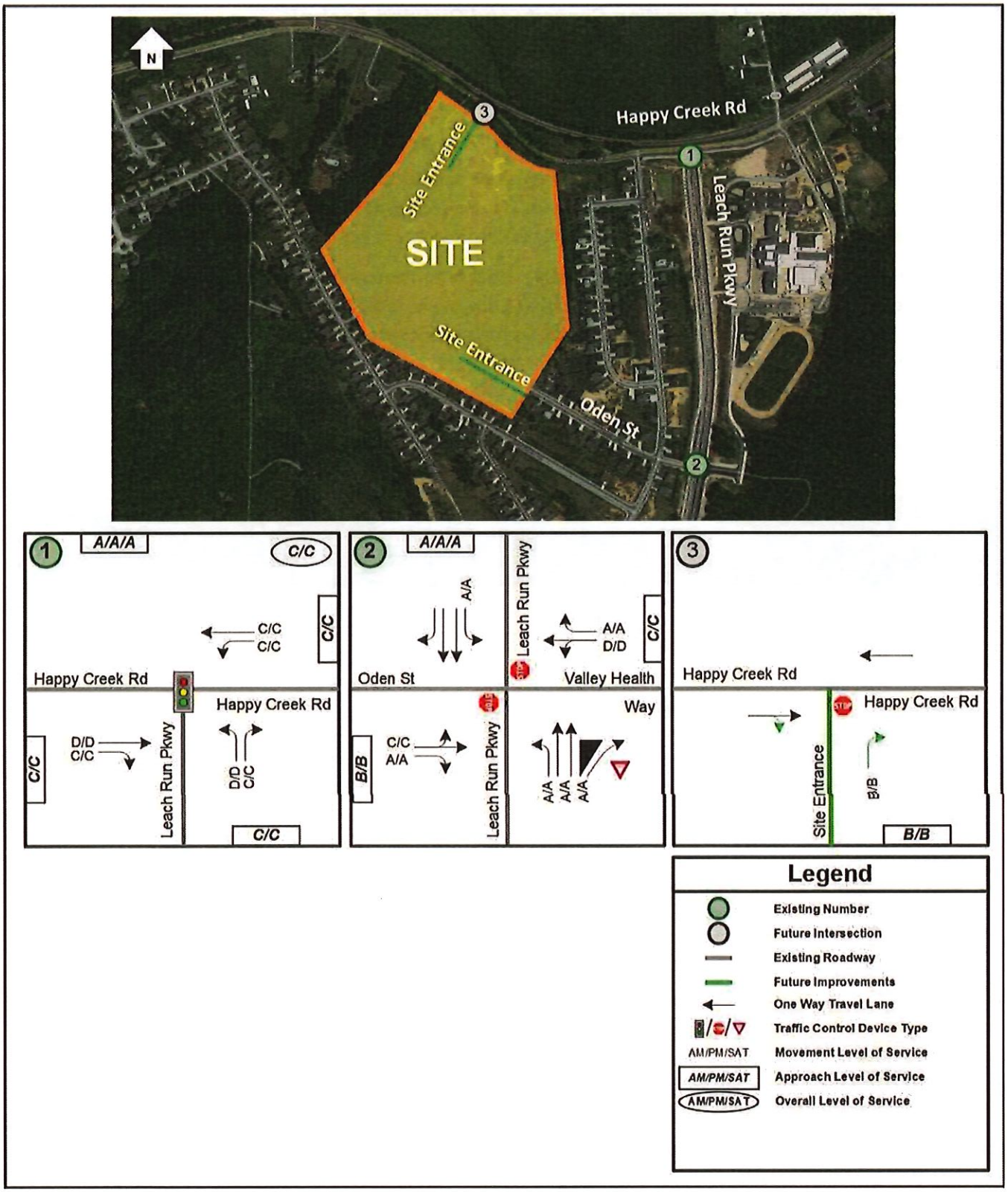


Figure 15: 2028 Future Conditions with Development – Level of Service Results

Preliminary Right Turn Lane Warrant Assessments

The right turn lane warrants are based on VDOT's Road Design Manual (RDM), Appendix F. In order to determine the need for exclusive left or right turn lanes at the site accesses along Apple Valley Road, the traffic data and anticipated development program provided in the *Analysis of 2028 Future Conditions with Development* section were utilized. Additional graphics and information regarding the methodology used to determine the turn lane warrants are provided in Appendix G.

Warrants for right-turn storage lanes on two- and four-lane highways at intersections are based on Figure 3-26 and Figure 3-27 in Appendix F of VDOT's RDM. These figures provide a graphical representation for determining the necessity of a right turn lane by comparing the total volumes of a given approach with their respective right turn volumes.

Right Turn Lane Warrant Assessment

Table 6 shows that per VDOT RDM, a right turn lane is not warranted on the eastbound approach at the proposed site access, given the right turning volume, approach volume, and the minimum right turn lane and taper thresholds.

Table 6: Right Turn Lane Warrant Assessment Results (2028 Future Conditions with Development)

Study Scenario	Approach Volume	Right Turn Volume	Minimum Right Turn Taper Threshold	Minimum Right Turn Full Lane Threshold	Treatment
INT 3 -Happy Creek Rd and RIRO Entrance EBR - 2028 TF AM Peak	331	8	37	75	Not Warranted
INT 3 -Happy Creek Rd and RIRO Entrance EBR - 2028 TF PM Peak	316	27	38	77	Not Warranted

Access Management Assessment

The minimum spacing standards for the Commonwealth of Virginia are specified in VDOT's Road Design Manual (RDM). Appendix F of the RDM focuses primarily on access management practices. The minimum spacing standard is specified in Table 2-2 through Table 2-4. Table 2-2 provides guidance on the minimum spacing standard for commercial entrances, intersections, and median crossovers, and is based on a roadway's speed limit and functional classification.

Happy Creek Road in the vicinity of the proposed development is classified by VDOT as a major collector roadway. The speed limit on the roadway segment in the vicinity of the study area is 35 mph.

The applicable intersection spacing requirements (centerline-to-centerline) per RDM Appendix F Table 2-3 are illustrated in **Table 7**. This section evaluates the minimum spacing requirements at the proposed site. The proposed intersection spacings by roadway are illustrated in **Figure 16.**

Table 7: VDOT Minimum Intersection Spacing Requirements for Commercial Entrances, Intersections, and Median Crossovers (RDM, Appendix F, Table 2-3)

Highway Functional Class	Design Speed (mph)	Minimum Centerline to Centerline Spacing (Feet)			
		(Type 1) Signalized Intersection	(Type 2) Unsignalized Intersection or Full Crossover	(Type 3) Full Access / Directional Crossover	(Type 4) Partial Access
Principal Arterial	≤ 30 mph	1,050	880	440	250
	35 to 45 mph	1,320	1,050	565	305
	≥ 50mph	2,640	1,320	750	495
Minor Arterial	≤ 30 mph	880	660	355	200
	35 to 45 mph	1,050	660	470	250
	≥ 50mph	1,320	1,050	555	425
Collector	≤ 30 mph	660	440	225	200
	35 to 45 mph	660	440	335	250
	≥ 50mph	1,050	660	445	360

Notes:

1. Based on the Virginia Department of Transportation's (VDOT) Road Design Manual (RDM), Appendix F Table 2-2 for Minimum Spacing Standards

2. Design speed for roadways with posted speed of 45 mph or less is at least equal to the posted speed. For roadways with a posted speed of 50 mph or higher, the design speed is at least 5 mph higher than the posted speed. Where design speed is not available, the posted speed should be used.

Figure 16 shows the intersection spacing requirements and the measured intersection spacing for the proposed access on Happy Creek Road.

Figure 16: Proposed Intersection Spacing

Conclusions

This report presented the findings of a Traffic Impact Analysis (TIA) conducted for the proposed Ashton Green Rezoning in Front Royal, Virginia.

The Applicant is proposing to rezone the property to R-1 (Residential Low Density) in order to construct up to 104 single-family detached units. The proposed development was initially scoped to construct 105 single-family detached units, and, for the purposes of this study, the traffic impact of 105 single-family detached units was analyzed to provide conservative results. The development is anticipated to be complete by 2028. Access to the site will be provided via an existing full-access entrance on Oden Street and a proposed Right-in-right-out entrance on Happy Creek Road.

Analysis Results

2024 Existing Conditions

- Based on the capacity analysis of the 2024 Existing Conditions, the signalized study intersection currently operates at an overall acceptable level of service during the AM and PM peak hours.
- All approaches at all study intersections operate at an acceptable level of service during the AM and PM peak hours.
- Based on the queueing analysis, all turning movements have 95th percentile queue lengths that are accommodated within the available storage length of the turn bays.

2028 Future Conditions without Development

- The background study named *Shenandoah Shores Road Traffic Forecast dated October 2023* has no impact on the traffic volumes.
- Based on the capacity analysis of the 2028 Future Conditions without Development, the signalized study intersection is expected to operate at an overall acceptable level of service during the AM and PM peak hours.
- All approaches at all study intersections are expected to operate at an acceptable level of service during the AM and PM peak hours.
- Based on the queueing analysis, all turning movements have 95th percentile queue lengths that can be accommodated within the available storage length of the turn bays.

2028 Future Conditions with Development

- The proposed development will consist of 104 single-family detached units and is anticipated to generate approximately 78 new trips during the AM peak hour, 104 new trips during the PM peak hour, and 1,055 new daily trips on a typical weekday. The development is anticipated to be complete by 2028.
- Based on the capacity analysis of the 2028 Future Conditions with Development, the signalized study intersection is expected to operate at an overall acceptable level of service during the AM and PM peak hours.
- All approaches at all study intersections are expected to operate at an acceptable level of service during the AM and PM peak hours.
- Based on the queueing analysis, all turning movements have 95th percentile queue lengths that can be accommodated within the available storage length of the turn bays.

Overall Conclusion

Based on the capacity and queueing analysis results, the proposed development will not have a substantial impact on the surrounding transportation and roadway network. Therefore, no improvements are recommended to mitigate the traffic generated by the proposed development.

TECHNICAL APPENDIX

Appendix A: Scoping Document

Appendix B: Existing Traffic Count Data

Appendix C: Level of Service & Delay Definitions

Appendix D: Analysis Worksheets of 2024 Existing Conditions

Appendix E: Analysis Worksheets of 2028 Future Conditions without Development

Appendix F: Analysis Worksheets of 2028 Future Conditions with Development

Appendix G: Turn Lane Warrants

APPENDIX A: SCOPING DOCUMENT

THIS IS NOT A CHAPTER 870 STUDY

VDOT Virginia Department of Transportation	PRE-SCOPE OF WORK MEETING FORM Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information			
Consultant Name: Tele: E-mail:	Kevin Sitzman, Gorove Slade Associates, Inc. 703.787.9595 ksitzman@goroveslade.com		
Developer/Owner Name: Tele: E-mail:	Chris Hornung 540.273.7498 chornung@teamrdg.com		
Project Information			
Project Name:	Happy Creek Property	Locality/County:	Town of Front Royal
Project Location: (Attach regional and site specific location map)	The proposed development site is generally situated south of Happy Creek Road, west of Leach Run Parkway, and south of Happy Ridge Drive in Town of Front Royal, Virginia.		
Submission Type	Comp Plan ☐	REZ/CUP ☒	Site Plan ☐ / Subd Plat ☐
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	The site is situated on one parcel that can be identified on Warren County Tax Maps with the following Tax Map #: 20A212-4. The property totals approximately 41.11 acres and is currently zoned as R-S (Suburban Residential). The Applicant is proposing to rezone the property to R-1 (Residential Low Density) in order to construct up to 105 Single Family Detached units. The development is anticipated to be complete by 2028. Access to the site will be provided via an existing full-access entrance on Oden Street and a proposed Right-in-right-out entrance on Happy Creek Road.		
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☒	Commercial ☐	Mixed Use ☐ / Other ☐
	Residential Uses(s) ITE LU Code(s): 210 Number of Units: 105 DU **Commercial Use(s)** ITE LU Code(s): Square Ft or Other Variable:		**Other Use(s)** ITE LU Code(s): Square Ft or Other Variable:
Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☒	500 – 999 ☐ / 1,000 or more ☐

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Traffic Impact Analysis Assumptions			
Study Period	Existing Year: 2024	Build-out Year: 2028	Design Year: N/A
Study Area Boundaries (Attach map)	North: Happy Creek Rd	South: Oden St	
	West: Parcel Limits	East: Leach Run Pkwy	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Shenandoah Shores Rd Traffic Forecast – October 2023		
Consistency With Comprehensive Plan (Land use, transportation plan)	Yes		
Available Traffic Data (Historical, forecasts)	2024 TMCs VDOT Historical AADT Data		
Trip Distribution **(Please refer to attached Figure 2 in Supplement.)**	Road Name: Happy Creek Rd (to/from the West) – 45%	Road Name: Happy Creek Rd (to/from the East) –5%	
	Road Name: Leach Run Pkwy (to/from the South) – 50%		
Annual Vehicle Trip Growth Rate: (See Note 4.)	1.0%/year (2024-2028)	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☐ SAT
		Peak Hour of the Adj. (to be used in study)	AM: 78 / PM: 104 / Daily: 1,055
Study Intersections and/or Road Segments (Attach additional sheets as necessary) **(Please refer to attached Figure 1 in Supplement.)**	1. Happy Creek Rd & Leach Run Pkwy	7.	
	2. Leach Run Pkwy & Oden St	8.	
	3. Happy Creek Rd and RIRO Entrance	9.	
	4.	10.	
	5.	11.	
	6.	12.	
Trip Adjustment Factors	Internal allowance Reduction: ☐ Yes ☒ No	Pass-by allowance Reduction: ☐ Yes ☒ No	
Software Methodology	☒ Synchro ☐ HCS (v.2000/+) ☐ SIDRA ☐ CORSIM ☐ Other _____		

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	Existing traffic signals that could be affected: 1. Happy Creek Rd & Leach Run Pkwy Analysis Software: Synchro version 11 Results: HCM 6 Methodology (See Note 9.) Queue Lengths to be Reported: 95th Percentile
Improvement(s) Assumed or to be Considered	Shenandoah Shores Rd Traffic Forecast – October 2023
Background Traffic Studies Considered	None
Plan Submission	☐ Master Development Plan (MDP) ☒ Generalized Development Plan (GDP) ☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☐ Bike/Ped Accommodations ☒ Intersection(s) ☐ TDM Measures ☐ Other (_____)

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

NOTES on ASSUMPTIONS:

1. Synchro files/signal timings will be obtained from VDOT.
2. The scenarios to be included in the study are 2024 Existing Conditions, 2028 Future Conditions without Development, and 2028 Future Conditions with Development. The study will analyze AM and PM peak hours for all above scenarios.
3. Existing turning movement counts will be collected and utilized to develop baseline conditions.
4. In order to project 2028 future conditions, a regional growth rate of 1.0% per year will be applied to all movements at all the study intersections for the period between 2024 and 2028. The growth volumes will be balanced along the road network by increasing the mainline through movements at subsequent study intersections along the road network where applicable.
5. Existing peak hour factors will be based on the traffic counts and utilized on a by-intersection basis. Peak hours factors by intersection in the range of 0.85 to 1.00 will be used for the existing scenario. Peak hour factors of 0.92 will be used for all future scenarios if the existing peak hour factor by intersection is less than 0.92, and for all new intersections.
6. Heavy vehicle percentages (HV%) will be based on existing counts. For any new intersection and at site entrances, the HV% will be based on existing counts and the Site truck trip generation, per movement.
7. For any approach, a level of service (LOS) D or better would be considered as acceptable/desirable for traffic operations. For all approaches, the projected future conditions without development LOS and delay will be maintained in the future with development conditions. Will show intersection, approach, and movement LOS.
8. 95th percentile queue lengths will be provided in addition to the capacity analyses. The queue lengths will be determined from *Synchro 11*.
9. HCM 6 methodology will be utilized in the capacity analyses where applicable; HCM 2000 methodology will be utilized if HCM 6 methodology is not applicable.

SIGNED: _____ DATE: 3/19/2024
Applicant or Consultant

PRINT NAME: Kevin Sitzman, PE
Applicant or Consultant

SIGNED: _____ DATE: _____
VDOT Representative

PRINT NAME: _____
VDOT Representative

SIGNED: _____ DATE: _____
Local Government Representative

PRINT NAME: _____
Local Government Representative

Table 1: Historic Growth (Based on VDOT Traffic Data)

			Published VDOT AADT					Annual Growth Rate			
Road Segment	From:	To:	2018	2019	2020	2021	2022	2018-2019	2019-2020	2020-2021	2021-2022
Happy Creek Rd	6th St	ECL Front Royal	8600	8600	6900	7800	7825	0%	-20%	13%	0.3%

*Note: AADT Information not available for Leach Run Pkwy and Oden St

Figure 1: Site Location and Study Intersections

Figure 2: Direction of Approach

Table 2: Trip Generation – Peak Hour of the Adjacent Street

Land Use	ITE Code	Size	----- Weekday -----						
			AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	Total
Single-Family Detached Housing (EQUATIONS)	210	105 DU	19	59	78	66	38	104	1,055

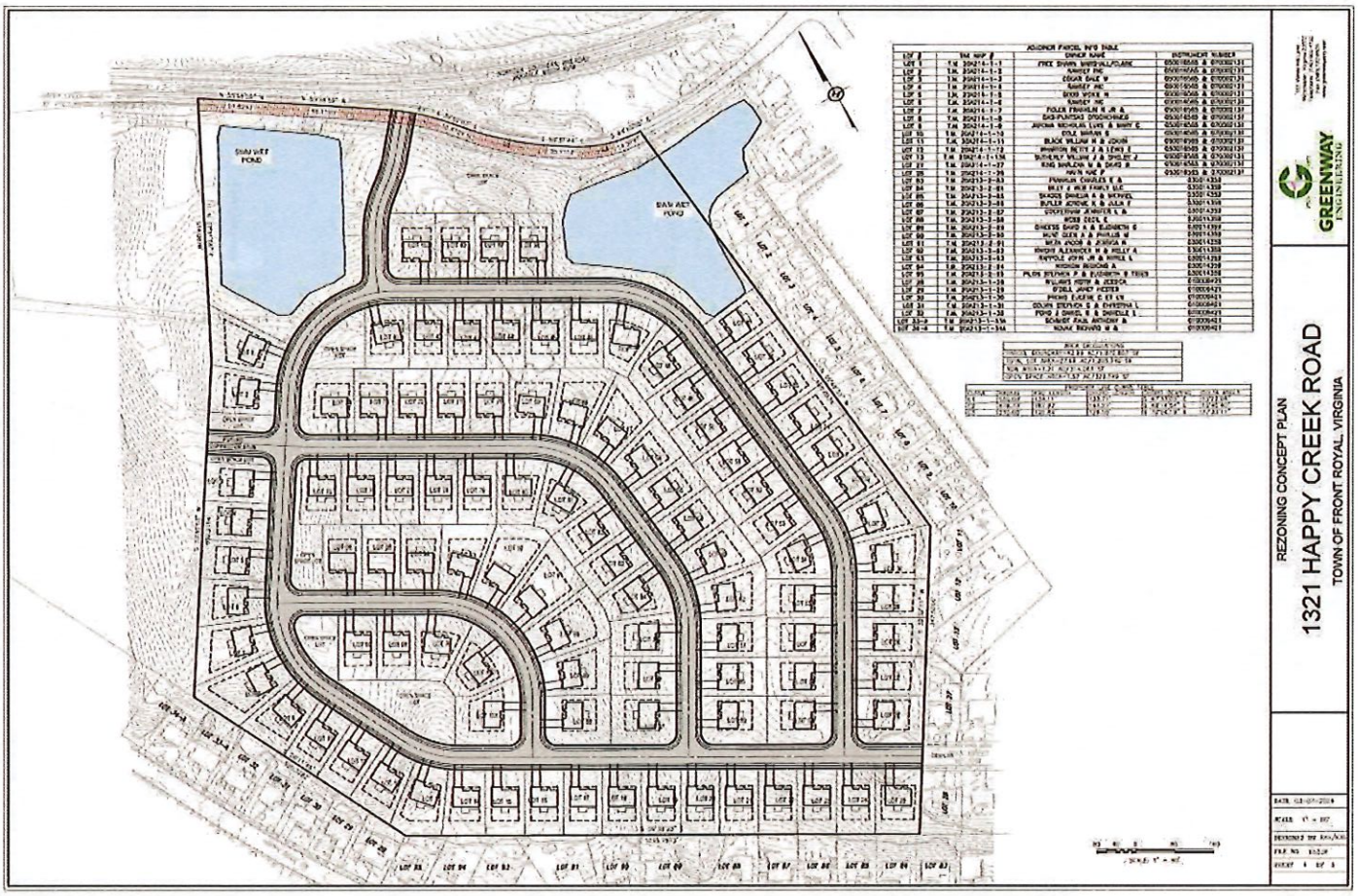


Figure 3: Conceptual Plan

APPENDIX B: EXISTING TRAFFIC COUNT DATA

0	0	0	0	0	0	191	157	0	192
0.000	0.000	0.000	0.000	0.000	0.000	0.823	0.853	0.000	0.88
						0.888			

	SOUTHBOUND				EASTBOUND				
0	0	0	0	0	0	1	1	0	1
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	0	0	0	0	0	54	17	0	48
0	0	0	0	0	0	60	12	0	31
0	0	0	0	0	0	55	16	0	23
2	0	0	0	0	0	58	10	0	16
0	0	0	0	0	0	56	11	0	24
0	0	0	0	0	0	50	5	0	26
0	0	0	0	0	0	65	8	0	29
0	0	0	0	0	0	61	14	0	24
0	0	0	0	0	0	47	10	0	32
1	0	0	0	0	0	43	8	0	28
0	0	0	0	0	0	36	8	0	18
0	0	0	0	0	0	33	8	0	17

NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
3	0	0	0	0	0	618	127	0	31
3% 0.40%					0.00%	82.95%	17.05%	0.00%	31.4
PM	3:30 PM 12:00 AM								
2	0	0	0	0	0	227	55	0	118
0.250	0.000	0.000	0.000	0.000	0.000	0.946	0.809	0.000	0.61
						0.979			

	0	0	0	0	0	0	174	155	0	179
	0.000	0.000	0.000	0.000	0.000	0.000	0.806	0.842	0.000	0.86
							0.866			

		SOUTHBOUND				EASTBOUND				
	0	0	0	0	0	0	1	1	0	1
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	0	0	0	0	0	52	17	0	42
	0	0	0	0	0	0	59	11	0	29
	0	0	0	0	0	0	52	16	0	21
	2	0	0	0	0	0	58	10	0	13
	0	0	0	0	0	0	54	11	0	22
	0	0	0	0	0	0	50	5	0	26
	0	0	0	0	0	0	65	7	0	29
	0	0	0	0	0	0	60	13	0	23
	0	0	0	0	0	0	47	9	0	30
	1	0	0	0	0	0	43	8	0	27
	0	0	0	0	0	0	35	8	0	18
	0	0	0	0	0	0	33	8	0	17
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	3	0	0	0	0	0	608	123	0	29
5%	0.41%					0.00%	83.17%	16.83%	0.00%	30.5
PM		3:30 PM	287	0	0					
	2	0	0	0	0	0	221	54	0	105
	0.250	0.000	0.000	0.000	0.000	0.000	0.936	0.794	0.000	0.62
							0.982			

	0	0	0	0	0	0	17	2	0	13
	0.000	0.000	0.000	0.000	0.000	0.000	0.708	0.250	0.000	0.4
							0.792			

		SOUTHBOUND				EASTBOUND				
	0	0	0	0	0	0	1	1	0	
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	0	0	0	0	0	2	0	0	6
	0	0	0	0	0	0	1	1	0	2
	0	0	0	0	0	0	3	0	0	2
	0	0	0	0	0	0	0	0	0	3
	0	0	0	0	0	0	2	0	0	2
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	1	1	0	1
	0	0	0	0	0	0	0	1	0	2
	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	0	0	0	0	0	10	4	0	19
2%	0.00%					0.00%	71.43%	28.57%	0.00%	55.8
PM		3:30 PM	287	0	0					
	0	0	0	0	0	0	6	1	0	13
	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.250	0.000	0.54
							0.583			

0	0	0	0	0	0	1	0	0	0
0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.0(
						0.250			

	SOUTHBOUND				EASTBOUND				
0	0	0	0	0	0	1	1	0	1
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	0	0	0	0	0	0	0	0	0
)% 0.00%									0.(
PM	3:30 PM	287	0	0					
0	0	0	0	0	0	0	0	0	0
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

AM	0	0	1	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	2	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB
:	0	0	3	0	0	0	0	0
			100.00%	0.00%				
	07:45 AM - 08:45 AM		7:45 AM	39	-1	-1		
	0	0	2	0	0	0	0	0
:			0.250					
			0.250					

	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
PM	0	0	0	0	0	0	0	0
PM	0	0	0	2	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	1	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	3	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB
S :	0	0	4	2	0	0	0	0
's :			66.67%	33.33%				
R :	**03:30 PM - 04:30 PM**		3:30 PM	284	-3	-3		
L :	0	0	0	2	0	0	0	0
R :				0.250				
			0.250					

Prepared by National Data & Surveying Services

Leach Run Pkwy & Happy Creek Rd

Peak Hour Turning Movement Count

ID: 24-260043-001
City: Front Royal

Day: Tuesday
Date: 3/5/2024

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	6:00 AM - 09:00 AM
NONE	NONE
03:30 PM - 04:30 PM	3:30 PM - 06:30 PM

SOUTHBOUND (Leach Run Pkwy)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	0	PM

EASTBOUND (Happy Creek Rd)

AM	NOON	PM		
290	0	406	⇦	
0	0	0	↶	0
0	0	0	↱	0
191	0	227	→	1
157	0	55	↷	1
AM	NOON	PM		

WESTBOUND (Happy Creek Rd)

PM	NOON	AM		
			↰	0
0	0	0	←	1
260	0	225	↰	1
118	0	192	↶	0
0	0	0		
412	0	294	⇨	
PM	NOON	AM		

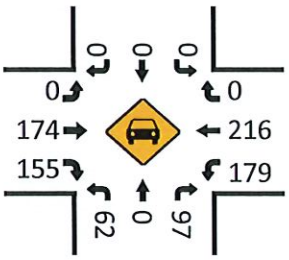
NORTHBOUND (Leach Run Pkwy)

PM	175	2	146	0	185	PM
NOON	0	0	0	0	0	NOON
AM	349	0	65	0	103	AM

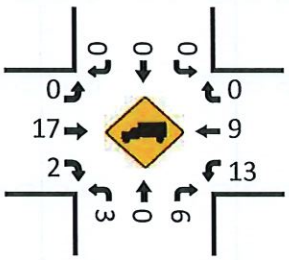
0	0	0	0	↶
0	1	0	1	↑

CONTROL			
Signalized			
TEV	933 AM	0 NOON	993 PM
PHF	0.97		0.83

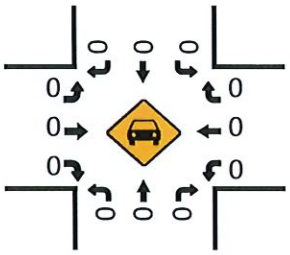
Cars (AM)



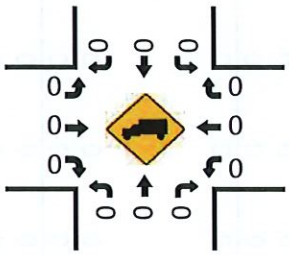
HT (AM)



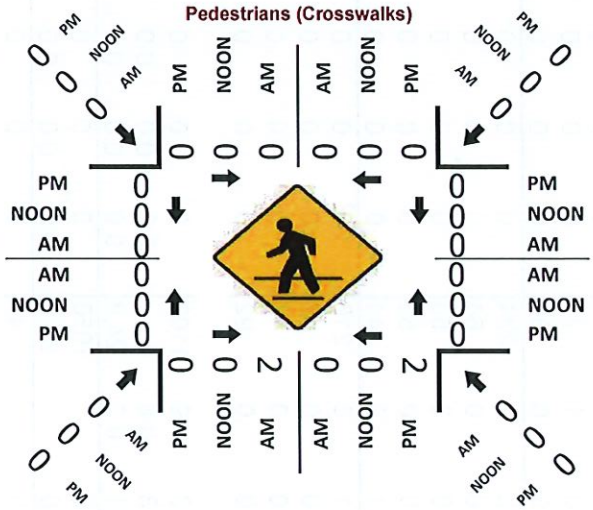
Cars (NOON)



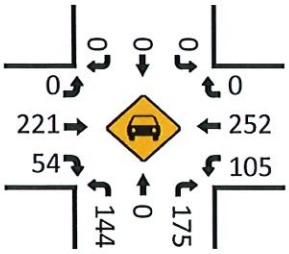
HT (NOON)



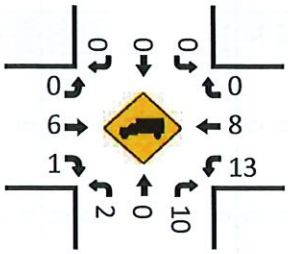
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



20	0	0	29	0	0	0	0	0	0	0	37	38	0	0	75	35	48	0	0	0	83
21	0	0	36	0	0	0	0	0	0	0	52	46	0	0	98	46	60	0	0	0	106
64	0	0	101	0	0	0	0	0	0	0	131	128	0	0	259	126	207	0	0	0	333
27	0	0	38	0	0	0	0	0	0	0	58	34	0	0	92	41	69	0	0	0	110
20	0	2	27	0	0	0	0	0	0	0	42	34	0	0	76	54	59	0	0	0	113
35	0	0	67	0	0	0	0	0	0	0	39	43	0	0	82	51	37	0	0	0	88
46	0	0	73	0	0	0	0	0	0	0	32	38	0	0	70	51	35	0	0	0	86
128	0	2	205	0	0	0	0	0	0	0	171	149	0	0	320	197	200	0	0	0	397
55	0	0	106	0	0	0	0	0	0	0	54	17	0	0	71	48	74	0	0	0	122
59	0	2	102	0	0	0	0	0	0	0	60	12	0	0	72	31	71	0	0	0	102
114	0	2	208	0	0	0	0	0	0	0	114	29	0	0	143	79	145	0	0	0	224
46	0	0	71	0	0	0	0	0	0	0	55	16	0	0	71	23	66	0	0	0	89
25	2	0	54	0	0	0	0	0	0	0	58	10	0	0	68	16	49	0	0	0	65
34	0	1	71	0	0	0	0	0	0	0	56	11	0	0	67	24	65	0	0	0	89
22	0	0	38	0	0	0	0	0	0	0	50	5	0	0	55	26	78	0	0	0	104
127	2	1	234	0	0	0	0	0	0	0	219	42	0	0	261	89	258	0	0	0	347
37	0	0	64	0	0	0	0	0	0	0	65	8	0	0	73	29	61	0	0	0	90
35	0	3	50	0	0	0	0	0	0	0	61	14	0	0	75	24	56	0	0	0	80
43	0	0	58	0	0	0	0	0	0	0	47	10	0	0	57	32	57	0	0	0	89
32	1	0	44	0	0	0	0	0	0	0	43	8	0	0	51	28	43	0	0	0	71
147	1	3	216	0	0	0	0	0	0	0	216	40	0	0	256	113	217	0	0	0	330
37	0	0	48	0	0	0	0	0	0	0	36	8	0	0	44	18	35	0	1	0	54
32	0	0	44	0	0	0	0	0	0	0	33	8	0	0	41	17	33	0	0	0	50
69	0	0	92	0	0	0	0	0	0	0	69	16	0	0	85	35	68	0	1	0	104
683	3	9	1100	0	0	0	0	0	0	0	993	465	0	0	1458	706	1171	0	1	0	1878
62.1	0.3	0.8		0.0	0.0	0.0	0.0	0.0		0.0	68.1	31.9	0.0	0.0		37.6	62.4	0.0	0.1	0.0	
15.4	0.1	0.2	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.4	10.5	0.0	0.0	32.9	15.9	26.4	0.0	0.0	0.0	42.3
651	3		1056	0	0	0	0		0	0	957	453	0		1410	668	1132	0	1		1801
95.3	100.0		96.0	0.0	0.0	0.0	0.0		0.0	0.0	96.4	97.4	0.0		96.7	94.6	96.7	0.0	100.0		95.9
32	0		44	0	0	0	0		0	0	36	12	0		48	38	39	0	0		77
4.7	0.0		4.0	0.0	0.0	0.0	0.0		0.0	0.0	3.6	2.6	0.0		3.3	5.4	3.3	0.0	0.0		4.1

61.5	0.0	100	0.0	0.0	0.0	0.0	0	0.0	54.9	45.1	0.0	100	46.0	54.0	0.0	0.0	100	
		0.[illegible]7										0.888					0.923	0.972
97	0	[illegible]9	0	0	0	0	0	0	174	155	0	329	179	216	0	0	395	883
94.2	0.0	94.6	0.0	0.0	0.0	0.0	0.0	0.0	91.1	98.7	0.0	94.5	93.2	96.0	0.0	0.0	94.7	94.6
6	0	9	0	0	0	0	0	0	17	2	0	19	13	9	0	0	22	50
5.8	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	8.9	1.3	0.0	5.5	6.8	4.0	0.0	0.0	5.3	5.4

Run Pkwy thbound			Leach Run Pkwy Southbound					Happy Creek Rd Eastbound					Happy Creek Rd Westbound					
Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
M - 06:30 PM																		
Begins at 03:30 PM																		
55	0	106	0	0	0	0	0	0	54	17	0	71	48	74	0	0	122	299
59	0	102	0	0	0	0	0	0	60	12	0	72	31	71	0	0	102	276
46	0	71	0	0	0	0	0	0	55	16	0	71	23	66	0	0	89	231
25	2	54	0	0	0	0	0	0	58	10	0	68	16	49	0	0	65	187
185	2	333	0	0	0	0	0	0	227	55	0	282	118	260	0	0	378	993
55.6	0.6	100	0.0	0.0	0.0	0.0	0	0.0	80.5	19.5	0.0	100	31.2	68.8	0.0	0.0	100	
		0.785										0.979					0.775	0.830
175	2	321	0	0	0	0	0	0	221	54	0	275	105	252	0	0	357	953
94.6	100.0	96.4	0.0	0.0	0.0	0.0	0.0	0.0	97.4	98.2	0.0	97.5	89.0	96.9	0.0	0.0	94.4	96.0
10	0	12	0	0	0	0	0	0	6	1	0	7	13	8	0	0	21	40
5.4	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.8	0.0	2.5	11.0	3.1	0.0	0.0	5.6	4.0

0	140	201	5	0	2	10	59	0	107
0.000	0.833	0.824	0.625	0.000	0.250	0.833	0.670	0.000	0.54
	0.920				0.710				

	SOUTHBOUND				EASTBOUND				
0	1	2	1	0	0.5	0.5	1	0	.5
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	19	39	3	0	0	0	7	0	42
0	5	40	1	1	4	1	8	0	14
0	8	29	1	0	0	1	4	0	8
0	4	25	0	0	0	1	2	0	7
0	5	30	0	0	2	0	6	0	11
0	2	25	2	1	0	0	10	0	7
0	4	30	3	0	0	0	10	0	6
0	6	28	2	0	1	0	2	0	1
0	3	38	0	0	0	1	7	0	0
0	8	29	1	0	0	1	7	0	3
0	4	25	0	0	1	3	6	0	9
0	0	23	2	0	0	0	7	0	3
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	68	361	15	2	8	8	76	0	11
0.00%	15.25%	80.94%	3.36%	0.45%	8.70%	8.70%	82.61%	0.00%	33.1
PM	3:30 PM	12:00 AM							
0	36	133	5	1	4	3	21	0	71
0.000	0.474	0.831	0.417	0.250	0.250	0.750	0.656	0.000	0.42
	0.717				0.538				

	0	140	184	4	0	2	10	58	0	106
	0.000	0.833	0.836	0.500	0.000	0.250	0.833	0.659	0.000	0.54
			0.921				0.700			

	SOUTHBOUND					EASTBOUND				
	0	1	2	1	0	0.5	0.5	1	0	0.5
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	19	33	3	0	0	0	7	0	42
	0	5	37	1	1	4	1	8	0	14
	0	8	27	1	0	0	1	4	0	8
	0	4	22	0	0	0	1	2	0	7
	0	5	28	0	0	2	0	6	0	11
	0	2	25	2	1	0	0	10	0	7
	0	4	30	3	0	0	0	10	0	6
	0	6	25	2	0	1	0	2	0	1
	0	3	35	0	0	0	1	7	0	0
	0	8	28	1	0	0	1	7	0	3
	0	4	25	0	0	1	3	6	0	9
	0	0	23	2	0	0	0	7	0	3
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	68	338	15	2	8	8	76	0	11
9%	0.00%	16.08%	79.91%	3.55%	0.47%	8.70%	8.70%	82.61%	0.00%	33.
PM		3:30 PM	287	0	0					
	0	36	119	5	1	4	3	21	0	71
	0.000	0.474	0.804	0.417	0.250	0.250	0.750	0.656	0.000	0.42
			0.732				0.538			

	0	0	17	1	0	0	0	1	0	1
	0.000	0.000	0.708	0.250	0.000	0.000	0.000	0.250	0.000	0.25
			0.750					0.250		

		SOUTHBOUND				EASTBOUND				
	0	1	2	1	0	0.5	0.5	1	0	5
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	0	6	0	0	0	0	0	0	0
	0	0	3	0	0	0	0	0	0	0
	0	0	2	0	0	0	0	0	0	0
	0	0	3	0	0	0	0	0	0	0
	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	3	0	0	0	0	0	0	0
	0	0	3	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
	0	0	23	0	0	0	0	0	0	0
)%	0.00%	0.00%	100.00%	0.00%	0.00%					
PM		3:30 PM	287	0	0					
	0	0	14	0	0	0	0	0	0	0
	0.000	0.000	0.583	0.000	0.000	0.000	0.000	0.000	0.000	0.00
			0.583							

0	0	0	0	0	0	1	0	0	0
0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.0
						0.250			

	SOUTHBOUND				EASTBOUND				
0	1	2	1	0	0.5	0.5	1	0	0.5
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NU	SL	ST	SR	SU	EL	ET	ER	EU	WI
0	0	0	0	0	1	0	0	0	0
					100.00%	0.00%	0.00%	0.00%	0.0
PM	3:30 PM	287	0	0					
0	0	0	0	0	1	0	0	0	0
0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.00
						0.250			

AM	0	1	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	1	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	1	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	4	0	0	1	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
AM	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB
:	6	1	0	1	0	0	2	0
:	85.71%	14.29%	0.00%	100.00%			100.00%	0.00%
	08:00 AM - 09:00 AM		8:00 AM	40	-1	-1		
	4	0	0	1	0	0	0	0
:	0.250			0.250				
	0.250		0.250					

	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
PM	0	6	0	0	0	0	1	0
PM	0	0	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	2
PM	0	0	0	0	0	3	0	0
PM	0	0	0	1	0	0	0	0
PM	5	0	0	1	0	0	0	0
PM	0	0	0	0	0	0	2	0
PM	0	4	0	0	0	0	0	0
PM	0	0	0	0	0	0	0	0
PM	3	0	2	1	2	3	0	0
PM	0	3	0	0	0	0	0	0
PM	0	0	0	3	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB
S :	8	13	2	6	2	6	3	2
's :	38.10%	61.90%	25.00%	75.00%	25.00%	75.00%	60.00%	40.00%
R :	**03:30 PM - 04:30 PM**		3:30 PM	284	-3	-3		
L :	0	6	0	0	0	3	1	2
R :		0.250				0.250	0.250	0.250
	0.250				0.250		0.375	

Prepared by National Data & Surveying Services

Leach Run Pkwy & Oden St/Valley Health Way

Peak Hour Turning Movement Count

ID: 24-260043-002
City: Front Royal

Day: Tuesday
Date: 3/5/2024

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	6:00 AM - 09:00 AM
NONE	NONE
03:30 PM - 04:30 PM	3:30 PM - 06:30 PM

SOUTHBOUND (Leach Run Pkwy)

AM	5	201	140	0	205
NOON	0	0	0	0	0
PM	5	133	36	1	334

EASTBOUND (Oden St/Valley Health Way)

AM	NOON	PM		
30	0	53		
0	0	0	0	
2	0	4	0.5	
10	0	3	0.5	
59	0	21	1	

WESTBOUND (Oden St/Valley Health Way)

	PM	NOON	AM
1	114	0	88
0.5	5	0	8
0.5	71	0	107
0	0	0	0
	66	0	265

NORTHBOUND (Leach Run Pkwy)

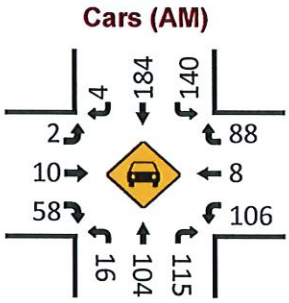
PM	225	0	43	215	27
NOON	0	0	0	0	0
AM	367	0	17	115	115

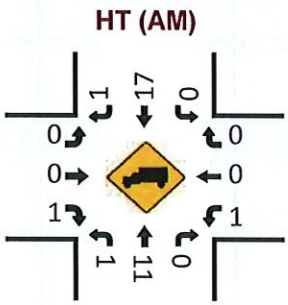
0	1	2	1	

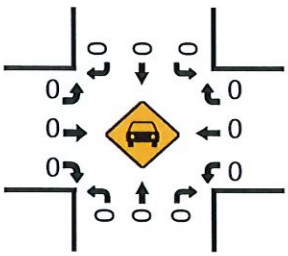
CONTROL

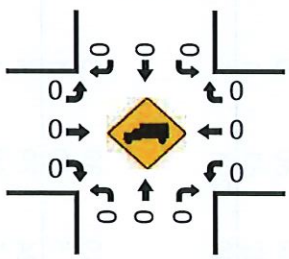
2-Way Stop(EB/WB)

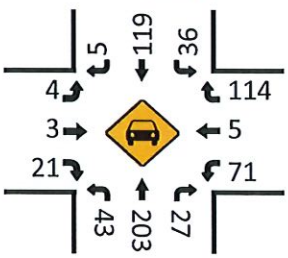
	AM	NOON	PM
TEV	867	0	678
PHF	0.77		0.68

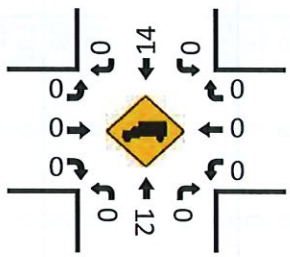


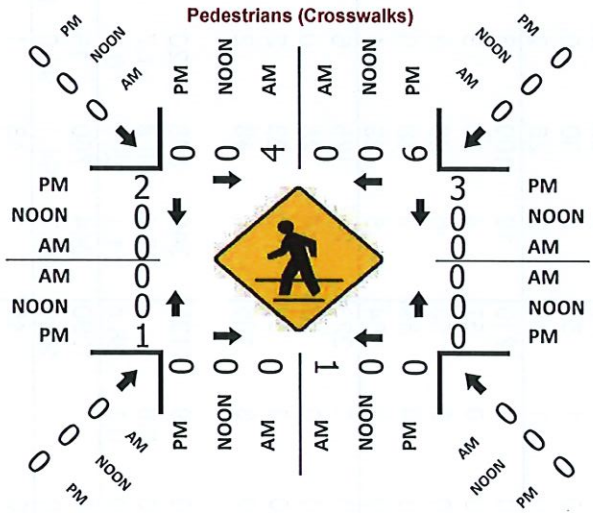












15	0	0	32	36	39	0	0	1	75	0	0	7	0	0	7	8	0	8	0	0	16
18	0	0	47	44	50	0	0	0	94	0	0	8	0	0	8	12	0	13	0	0	25
40	0	0	121	113	141	0	0	2	254	0	1	30	0	0	31	20	0	27	0	0	47
17	0	1	46	27	42	2	0	4	71	0	2	11	0	0	13	6	1	8	0	0	15
30	0	0	57	42	48	2	0	0	92	2	3	11	0	0	16	8	1	3	0	0	12
41	0	0	67	39	50	0	0	0	89	0	2	15	0	0	17	44	3	45	0	0	92
27	0	0	77	32	61	1	0	0	94	0	3	22	0	0	25	49	3	32	0	0	84
115	0	1	247	140	201	5	0	4	346	2	10	59	0	0	71	107	8	88	0	0	203
16	0	0	81	19	39	3	0	6	61	0	0	7	0	1	7	42	1	57	0	0	100
6	0	0	80	5	40	1	1	0	47	4	1	8	0	0	13	14	1	28	0	0	43
22	0	0	161	24	79	4	1	6	108	4	1	15	0	1	20	56	2	85	0	0	143
2	0	0	67	8	29	1	0	0	38	0	1	4	0	2	5	8	1	18	0	0	27
3	0	0	57	4	25	0	0	0	29	0	1	2	0	0	3	7	2	11	0	3	20
0	0	1	57	5	30	0	0	0	35	2	0	6	0	0	8	11	0	25	0	0	36
2	0	1	38	2	25	2	1	5	30	0	0	10	0	0	10	7	0	9	0	0	16
7	0	2	219	19	109	3	1	5	132	2	2	22	0	2	26	33	3	63	0	3	99
1	0	0	57	4	30	3	0	0	37	0	0	10	0	2	10	6	1	27	0	0	34
1	0	0	53	6	28	2	0	4	36	1	0	2	0	0	3	1	0	8	0	0	9
1	0	0	59	3	38	0	0	0	41	0	1	7	0	0	8	0	0	9	0	0	9
2	0	3	54	8	29	1	0	3	38	0	1	7	0	0	8	3	1	4	0	5	8
5	0	3	223	21	125	6	0	7	152	1	2	26	0	2	29	10	2	48	0	5	60
4	0	0	53	4	25	0	0	3	29	1	3	6	0	0	10	9	5	12	0	0	26
2	0	3	53	0	23	2	0	0	25	0	0	7	0	0	7	3	0	4	0	0	7
6	0	3	106	4	48	2	0	3	54	1	3	13	0	0	17	12	5	16	0	0	33
202	0	9	1135	345	808	20	2	28	1175	10	19	192	0	7	221	238	20	328	0	8	586
17.8	0.0	0.8		29.4	68.8	1.7	0.2	2.4		4.5	8.6	86.9	0.0	3.2		40.6	3.4	56.0	0.0	1.4	
6.5	0.0	0.3	36.4	11.1	25.9	0.6	0.1	0.9	37.7	0.3	0.6	6.2	0.0	0.2	7.1	7.6	0.6	10.5	0.0	0.3	18.8
201	0		1090	344	760	19	2		1125	10	19	191	0		220	237	20	327	0		584
99.5	0.0		96.0	99.7	94.1	95.0	100.0		95.7	100.0	100.0	99.5	0.0		99.5	99.6	100.0	99.7	0.0		99.7
1	0		45	1	48	1	0		50	0	0	1	0		1	1	0	1	0		2
0.5	0.0		4.0	0.3	5.9	5.0	0.0		4.3	0.0	0.0	0.5	0.0		0.5	0.4	0.0	0.3	0.0		0.3

40.0	0.0	100	40.0	58.1	1.4	0.0	100	2.8	14.1	83.1	0.0	100	52.7	3.9	43.3	0.0	100	
		[illegible]2					0.920					0.710					0.552	0.774
115	0	[illegible]5	140	184	4	0	328	2	10	58	0	70	106	8	88	0	202	835
100.0	0.0	95.1	100.0	91.5	80.0	0.0	94.8	100.0	100.0	98.3	0.0	98.6	99.1	100.0	100.0	0.0	99.5	96.3
0	0	12	0	17	1	0	18	0	0	1	0	1	1	0	0	0	1	32
0.0	0.0	4.9	0.0	8.5	20.0	0.0	5.2	0.0	0.0	1.7	0.0	1.4	0.9	0.0	0.0	0.0	0.5	3.7

Run Pkwy thbound			Leach Run Pkwy Southbound					Oden St/Valley Health Way Eastbound					Oden St/Valley Health Way Westbound					
Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
M - 06:30 PM																		
Begins at 03:30 PM																		
16	0	81	19	39	3	0	61	0	0	7	0	7	42	1	57	0	100	249
6	0	80	5	40	1	1	47	4	1	8	0	13	14	1	28	0	43	183
2	0	67	8	29	1	0	38	0	1	4	0	5	8	1	18	0	27	137
3	0	57	4	25	0	0	29	0	1	2	0	3	7	2	11	0	20	109
27	0	285	36	133	5	1	175	4	3	21	0	28	71	5	114	0	190	678
9.5	0.0	100	20.6	76.0	2.9	0.6	100	14.3	10.7	75.0	0.0	100	37.4	2.6	60.0	0.0	100	
		0.880					0.717					0.538					0.475	0.681
27	0	273	36	119	5	1	161	4	3	21	0	28	71	5	114	0	190	652
100.0	0.0	95.8	100.0	89.5	100.0	100.0	92.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0	96.2
0	0	12	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	26
0.0	0.0	4.2	0.0	10.5	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8

APPENDIX C: LEVEL OF SERVICE & DELAY DEFINITIONS

TECHNICAL MEMORANDUM

Subject: Level of Service Definitions

Introduction

The purpose of this memorandum is to define the level of service (LOS) metric that commonly used as a measure of effectiveness (MOE) for traffic operations.

All capacity analyses are based on the procedures specified by the Transportation Research Board's (TRB) Highway Capacity Manual (HCM), which is currently on its sixth edition. Level of service ranges from A to F. A brief description of each level of service for signalized and unsignalized intersections is provided below.

Signalized Intersections

Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The levels of service for signalized intersections are defined below:

- **Level of Service A** describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.
- **Level of Service B** describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
- **Level of Service C** describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.
- **Level of Service D** describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.
- **Level of Service E** describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences. LOS E has been set as the limit of acceptable conditions.
- **Level of Service F** describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection. It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

Unsignalized Intersections

At an unsignalized intersection, the major street through traffic and right-turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left-turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicate worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

- **Level of Service A** describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.
- **Level of Service B** describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.
- **Level of Service C** describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.
- **Level of Service D** describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.
- **Level of Service E** describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.
- **Level of Service F** describes operations with average total delay of 50 seconds per vehicle. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal driver behavior.

APPENDIX D: ANALYSIS WORKSHEETS OF 2024 EXISTING CONDITIONS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	178	155	205	208	80	133
v/c Ratio	0.58	0.22	0.56	0.32	0.36	0.29
Control Delay	42.7	3.9	27.8	22.8	41.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	3.9	27.8	22.8	41.3	4.4
Queue Length 50th (ft)	94	0	83	84	42	0
Queue Length 95th (ft)	167	36	147	147	89	22
Internal Link Dist (ft)	424			820	1281	
Turn Bay Length (ft)			250			
Base Capacity (vph)	966	828	372	1331	385	464
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.19	0.55	0.16	0.21	0.29

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	171	149	197	200	77	128
Future Volume (vph)	171	149	197	200	77	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1743	1568	1687	1792	1736	1524
Flt Permitted	1.00	1.00	0.42	1.00	0.95	1.00
Satd. Flow (perm)	1743	1568	739	1792	1736	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	178	155	205	208	80	133
RTOR Reduction (vph)	0	108	0	0	0	102
Lane Group Flow (vph)	178	47	205	208	80	31
Heavy Vehicles (%)	9%	3%	7%	6%	4%	6%
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov
Protected Phases	2	4	1	6	4	1
Permitted Phases		2	6			4
Actuated Green, G (s)	16.0	27.5	32.7	32.7	11.5	21.2
Effective Green, g (s)	16.0	27.5	32.7	32.7	11.5	21.2
Actuated g/C Ratio	0.18	0.30	0.36	0.36	0.13	0.23
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0	2.0
Lane Grp Cap (vph)	308	599	369	648	221	357
v/s Ratio Prot	0.10	0.01	c0.06	0.12	c0.05	0.01
v/s Ratio Perm		0.02	c0.14			0.01
v/c Ratio	0.58	0.08	0.56	0.32	0.36	0.09
Uniform Delay, d1	34.1	22.4	21.4	20.8	36.0	27.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.1	1.0	0.1	2.1	0.0
Delay (s)	35.7	22.5	22.4	20.9	38.2	27.0
Level of Service	D	C	C	C	D	C
Approach Delay (s)	29.5			21.6	31.2	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	90.3	Sum of lost time (s)	23.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	10	59	107	8	88	17	115	115	140	201	5
Future Volume (Veh/h)	2	10	59	107	8	88	17	115	115	140	201	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	12	69	126	9	104	20	135	135	165	236	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	782	741	118	698	747	68	242			135		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	782	741	118	698	747	68	242			135		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	99	96	92	52	97	89	98			89		
cM capacity (veh/h)	224	299	912	265	296	982	1293			1447		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	14	69	135	104	20	68	68	135	165	118	118	6
Volume Left	2	0	126	0	20	0	0	0	165	0	0	0
Volume Right	0	69	0	104	0	0	0	135	0	0	0	6
cSH	285	912	266	982	1293	1700	1700	1700	1447	1700	1700	1700
Volume to Capacity	0.05	0.08	0.51	0.11	0.02	0.04	0.04	0.08	0.11	0.07	0.07	0.00
Queue Length 95th (ft)	4	6	66	9	1	0	0	0	10	0	0	0
Control Delay (s)	18.3	9.3	31.6	9.1	7.8	0.0	0.0	0.0	7.8	0.0	0.0	0.0
Lane LOS	C	A	D	A	A				A			
Approach Delay (s)	10.8		21.8		0.5				3.2			
Approach LOS	B		C									

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	10	59	107	8	88	17	115	115	140	201	5
Future Vol, veh/h	2	10	59	107	8	88	17	115	115	140	201	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	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	0	0	-	0	205	-	215
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	6	10	2	2	8	20
Mvmt Flow	2	12	69	126	9	104	20	135	135	165	236	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	678	741	118	629	747	68	242	0	0	135	0	0
Stage 1	566	566	-	175	175	-	-	-	-	-	-	-
Stage 2	112	175	-	454	572	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.22	-	-	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	3.32	3.52	4.02	3.32	2.26	-	-	2.22	-	-
Pot Cap-1 Maneuver	338	343	912	367	340	981	1293	-	-	1447	-	-
Stage 1	476	506	-	810	753	-	-	-	-	-	-	-
Stage 2	881	753	-	555	502	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	266	299	912	297	297	981	1293	-	-	1447	-	-
Mov Cap-2 Maneuver	266	299	-	297	297	-	-	-	-	-	-	-
Stage 1	469	448	-	798	742	-	-	-	-	-	-	-
Stage 2	766	742	-	442	445	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	19.2	0.5	3.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1293	-	-	293	912	297	981	1447	-	-
HCM Lane V/C Ratio	0.015	-	-	0.048	0.076	0.456	0.106	0.114	-	-
HCM Control Delay (s)	7.8	-	-	17.9	9.3	26.9	9.1	7.8	-	-
HCM Lane LOS	A	-	-	C	A	D	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	2.3	0.4	0.4	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	267	65	139	306	174	218
v/c Ratio	0.73	0.09	0.49	0.46	0.60	0.39
Control Delay	50.0	4.2	28.2	26.6	47.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	4.2	28.2	26.6	47.9	4.2
Queue Length 50th (ft)	160	0	60	145	102	0
Queue Length 95th (ft)	238	20	102	213	171	22
Internal Link Dist (ft)	424			820	1281	
Turn Bay Length (ft)			250			
Base Capacity (vph)	945	785	294	1267	362	571
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.08	0.47	0.24	0.48	0.38

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	227	55	118	260	148	185
Future Volume (vph)	227	55	118	260	148	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1583	1626	1845	1770	1538
Flt Permitted	1.00	1.00	0.29	1.00	0.95	1.00
Satd. Flow (perm)	1845	1583	492	1845	1770	1538
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	267	65	139	306	174	218
RTOR Reduction (vph)	0	41	0	0	0	162
Lane Group Flow (vph)	267	24	139	306	174	56
Heavy Vehicles (%)	3%	2%	11%	3%	2%	5%
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov
Protected Phases	2	4	1	6	4	1
Permitted Phases		2	6			4
Actuated Green, G (s)	19.5	35.7	35.7	35.7	16.2	25.4
Effective Green, g (s)	19.5	35.7	35.7	35.7	16.2	25.4
Actuated g/C Ratio	0.20	0.36	0.36	0.36	0.17	0.26
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0	2.0
Lane Grp Cap (vph)	366	689	285	671	292	398
v/s Ratio Prot	c0.14	0.01	0.05	c0.17	c0.10	0.01
v/s Ratio Perm		0.01	0.13			0.02
v/c Ratio	0.73	0.03	0.49	0.46	0.60	0.14
Uniform Delay, d1	36.8	20.1	22.8	23.8	37.9	28.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	0.0	0.5	0.2	4.9	0.1
Delay (s)	42.9	20.1	23.3	24.0	42.8	28.0
Level of Service	D	C	C	C	D	C
Approach Delay (s)	38.4			23.8	34.6	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	98.1	Sum of lost time (s)	23.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			