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Thomas L. Smith Deputy Director of Operations

## **COMMONWEALTH of VIRGINIA** DEPARTMENT OF CONSERVATION AND RECREATION

July 29, 2021

Northern Virginia Community College Facilities Planning and Support Services Northern Virginia Community College Annandale Campus 8333 Little River Turnpike Annandale VA 22003

Your nutrient management plan (NMP) dated 7/15/2021 for Northern Virginia Community College Annandale Campus located in Fairfax County has been approved by the Virginia Department of Conservation and Recreation (DCR). The approved plan is for 13.74 acres.

This site has not been inspected by DCR and this approval is contingent upon field conditions being as stated in the NMP. Any revisions to this plan must be approved by DCR. Please note that this letter should be kept with the NMP and supporting documentation including nutrient application records. This plan expires on 7/15/2024. Please feel free to contact me with any questions or concerns regarding this approval.

Best regards,

State Jutto

Anita Tuttle Urban Nutrient Management Coordinator Division of Soil and Water Conservation 600 East Main Street, 24<sup>th</sup> Floor Richmond VA 23219 (804) 513-5958

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

# Nutrient Management Plan for the Annandale Campus Northern Virginia Community College

Prepared for:

Northern Virginia Community College Facilities Planning & Support Services, CW312 8333 Little River Turnpike Annandale, VA 22003

Prepared By: Sara J. Rilveria/Certified Nutrient Management Planner - Certification No. 943

## WSSI, Inc. 8525 Bell Creek Road Mechanicsville, VA 23116

Location Information									
Physical Address	8333 Little River Turnpike								
City State Zip	Annandale, VA 22003								
Coordinates	+38 50' 3.30"								
NAD 83 Deg Min Sec	- 77 14' 12.07''								
VAHU6 Watershed Code	PL30 – Accotink Creek								
County	Fairfax								
	Square Footage of Management Areas								
Total	13.74 acres (598,575 ft <sup>2</sup> )								
Area 1	13.74 acres (598,575 ft <sup>2</sup> )								
Plan Start Date	July 15, 2021								
Plan End Date	July 15, 2024								
Planner Signature	Sara Rilveria								

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### 1.0 INTRODUCTION AND SITE DESCRIPTION

## 1.1 Introduction

This Nutrient Management Plan (NMP) is for the Annandale Campus of the Northern Virginia Community College (NOVA) in Fairfax County, Virginia, just south of the Little River Turnpike and west of I-495 (Figure 1).

This NMP addresses only the nutrient management of turfgrass. Management of other vegetated areas containing trees, flowering ornamentals, small shrubs and groundcovers, is performed by each facility and their landscape contractor based on very site-specific conditions including but not limited to the type and status of vegetated areas, annual soil testing, and the occurrence of pests and weeds. This NMP is effective for three years until July 15, 2024 or until major renovation or other changes to maintenance practices occur. This NMP should be used as a resource for planning the quantity and timing of turfgrass nutrient application based on sound agronomic practices.

## **1.2** Site Description

The 76-acre Annandale Campus contains turfgrass in many areas including around campus buildings, along roadways and around and within parking lots. The Annandale Campus contains one athletic field located at the northwestern portion of the campus, adjacent to the campus lake. All turf areas have been seeded with a tall fescue blend (mix of fine leaved tall fescue and Kentucky bluegrass) and are therefore categorized as cool season turf.

In general, turfgrass is in good condition with the exception of some of the parking medians. These problem areas are generally located in the large parking lot located in the southern end of the campus and are discussed in Section 3.2.

Portions of the turfgrass areas are irrigated: along the front of Building CA, along portions of Parking Garage CP, and the front of CE. The remainder of the turf is non-irrigated.

Twelve environmentally sensitive areas including the campus lake and stormwater management facilities were identified on the Annandale Campus as shown on Figures 2 and 3. These areas are addressed in Section 4.

#### 1.3 Current and Future Turf Maintenance

All turf maintenance is performed by NOVA's landscaping contractor including mowing, herbicide, fertilizer, and lime applications, as well as aeration and overseeding.

A landscaping maintenance contractor will be performing most turf management including all nutrient applications. It will be the responsibility of the Landscape Supervisor and the campus Facility Manager to ensure the nutrient management plan is followed.

#### 2.0 SOIL SAMPLING AND ANALYSIS

Although most soils in the turf areas have been modified by cut and fill activities, the soils retain most of the characteristics presented in the U.S. Department of Agriculture (USDA) soil survey, and may still be classified as loams, silty loams, and clay loams. Areas around the lake have steep slopes and thin soils.

Soil samples were collected on March 17, 2021 from four (4) different turfgrass areas across the campus and submitted for laboratory analysis including pH, buffer pH, phosphorus and potassium, and other soil properties. Figure 2 shows the locations of the soil sampling areas as well as environmentally sensitive areas and Table 1 presents the laboratory results. Appendix A presents the soil laboratory data. An area previously under construction was added to this NMP. No sampling was performed within wooded or landscaped areas.

Soil laboratory results were converted into nutrient management ratings based on the Virginia Nutrient Management Standards and Criteria (VNMS&C). Soil phosphorous concentrations were rated from L- to L, and potassium concentrations were rated from M- to M+. Soil pH ranged from 5.9 to 6.1 Standard Units (SU).

### 3.0 NUTRIENT MANAGEMENT AREAS

Based on the soil test results, current turf conditions, the intensity of use, and overall visibility and aesthetic considerations, one Nutrient Management Area (NMA) at the Annandale Campus is established for this NMP. The number of nutrient management areas was kept to a minimum to facilitate effective management and still protect water quality and maintain healthy turf. Figure 3 shows the nutrient management areas. Table 2 presents the application schedule for the nutrient management areas, discussed in greater detail in Section 3.1 below.

NMA 1 includes all 13.74-acres of cool season fescue turf at the Annandale Campus including the athletic field. As discussed in Section 3.2, some areas within NMA 1 should be temporarily removed from active nutrient management until an effective groundcover/turfgrass can be established.

#### 3.1 Nutrient and Liming Applications

#### 3.1.1 Nitrogen, Phosphorous and Potassium

Nitrogen, phosphorous (P2O5) and potassium (K2O) are the three macronutrients essential for healthy turf and, along with lime applications, are the central focus of the NMP. Phosphorous and potassium recommendations are based on the soil laboratory results. Nitrogen recommendations are based on the turfgrass needs, not soil test results, which vary based on the type of turfgrass (cool vs. warm season) and level of management (standard vs. intensive). Recommended rates and timing of all three macronutrients is based on the VNMS&C. This NMP uses the most restrictive application rate based on individual sample results where multiple sampling areas are part of the same NMA.

The acceptable window for nitrogen application for cool season fescue turf at the Annandale Campus is six weeks prior to the last spring average frost and six weeks after the first fall average frost from February 27 until December 6. Although aggressive spring and summer nitrogen fertilization can result in lush, dark green foliage, this occurs at the expense of the turf's root system. Turf with an inadequate root system will then struggle in the summer heat and moisture conditions. Additionally, too much nitrogen in spring and summer for cool season turf can result in leaching or runoff to nearby waterbodies. For these reasons, only 0.5 pound of slow-release nitrogen is recommended during May to June to provide a sustained growth response without a flush in shoot growth at the expense of the roots. The bulk of nitrogen should be applied in monthly increments from September through November.

As phosphorous and potassium are not as mobile as nitrogen and generally reside in soil for longer periods of time, the application timing of these two macronutrients is not as critical as nitrogen. Incremental applications of these nutrients from September to November are recommended.

#### 3.1.2 Lime and pH

Soil acidity is critical to plants because it affects the availability of nutrients in the soil and potential leaching of nutrients from the soil. Cool season fescue prefers a soil pH that is slightly acidic, at a level of approximately 6.2 Standard Units (SU). Periodic lime applications are necessary for many Virginia soils to correct low pH, add buffering capacity, to provide secondary nutrients calcium and magnesium as well as some micronutrients. Liming rates are based on soil test pH and buffer indices. Based on the 2021 soil samples, 40 pounds per 1000 square feet of lime application is recommended for the first year of this NMP (see Table 2).

Liming recommendations are for the first year following soil sampling only. The soil should be tested for soil pH and Buffer pH in the late fall to winter each year to determine if additional annual liming is necessary.

#### 3.2 Problem Turfgrass Areas and Temporarily Inactive Nutrient Management Areas

Problem areas remain in the parking medians within the large parking lot located in the southern portion of the campus. These problem turf areas are the result of poor soil quality, over-compaction, active erosion, or shading and poor soil moisture conditions caused by nearby trees. These areas where there is ineffective groundcover should continue to be temporarily removed from active nutrient management until corrective measures can be applied to improve the turfgrass or groundcover conditions.

Corrective action options will vary by area but may include additional soil amendments (compost/topsoil), aeration or shallow tilling, and the use of mulch, turf mats and blankets. Alternative landscaping such as pavers, and other hardscape treatments may be the best alternative for some areas. If turfgrass is the desired vegetative cover, the soil should be retested for soil and buffer pH and adjusted accordingly with limestone as part of corrective action. Once turfgrass is re-established the areas may be included in Nutrient Management Area 1 for nutrient recommendations.

### **3.3** Selection of Fertilizers

Specific fertilizers have not been selected as a part of this NMP to provide greater flexibility and cost savings. The landscape contractor has the option to select either commonly used fertilizer blends that they may already have in stock or are readily available, or they can use custom blends, a common practice in the commercial landscaping industry. Slow-release nitrogen containing fertilizers are recommended. This NMP will require revision should the landscape contractor and the campus Facility Manager decide to use animal manures or Class B biosolids (not of exceptional quality).

Provided the maximum rate of nitrogen per application and the total annual rates of all three nutrients are not exceeded as detailed in Table 2, the landscape contractor may use their discretion with the exact ratio of nutrients applied per application.

### 3.4 **Pre- and Post-Emergent Herbicides**

Weed control is a necessary requirement for healthy turf and has been implemented in the past at the Annandale Campus. In the previous NMP period, pre and post emergent herbicides containing nitrogen fertilizers were applied in spring and early summer months for the campus grounds. As presented in Section 3.1.1, only one application of slow-release nitrogen is recommended in the late spring. Therefore, additional straight application of herbicides without nitrogen additives may be required.

#### **3.5 Precautions for Fertilizer Applications**

General precautions for fertilizer application include:

- Try to avoid applying fertilizers on steep slopes 48-hours prior to a rain event.
- Do not apply fertilizers to frozen or snow-covered ground, nor should they ever be used as ice melt.
- Avoid/minimize application of fertilizers to impervious areas such as parking lots, roads, and sidewalks, and within 25 feet of environmentally sensitive areas and stormwater collection/management facilities.
- Remove any granular materials that land on impervious surfaces by sweeping and collecting, and either put the collected material back in the bag or spread it onto the turf.

## 4.0 ENVIRONMENTALLY SENSITIVE AREAS AND RECOMMENDED BUFFERS

Six environmentally sensitive areas including stormwater management facilities were identified on the Annandale Campus as shown on Figures 2 and 3:

- Two detention basins located south of Buildings CE and CM
- A retention basin located at the northern entrance
- A retention basin located south of parking garage CP
- A bioretention facility located along the south side of Building CA
- An infiltration trench located north of Building CA
- A detention basin north of the CW building.
- Three rain gardens, two Filterras and an underground manufactured stormwater detention facility associated with the CH building.

A no-fertilizer/pesticide application buffer area of at least 25 feet and preferably 50 feet should be established around these sensitive areas. Where practicable, native vegetation may be an alternative to turf in the buffer areas. The lake contains virtually no vegetated buffer. It is recommended that a vegetated buffer be installed in these areas to improve water quality. Turf in and around the detention basins should be mowed at a greater height.

#### 5.0 OTHER TURF MANAGEMENT CONSIDERATIONS

Aeration - Extensive core cultivation/aeration in the late summer to early fall is recommended for the Annandale campus. Core aeration is very disruptive to surface smoothness, but it is the best way to relieve the physical effects of soil compaction and increase soil oxygen levels.

**Grass Seed Type** - Reference the most recent Virginia Cooperative Extension's *Virginia Turfgrass Variety Recommendations* online found at <u>https://www.sites.ext.vt.edu/newsletter-archive/turfgrass/index.html</u> when selecting seed mix for over-seeding. The type should be suitable to environmental conditions of the Northern Virginia Transition zone. A general recommendation for the Annandale Campus is 90% Tall Fescue possibly blended with 10% Kentucky Bluegrass for turf in primarily sunny locations. Fine fescue blends may be more appropriate for shadier turf areas.

**Iron** - Iron applications (particularly foliar applications) may periodically be used for enhanced greening as an alternative to nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer/fall applications for warmseason grasses. Since iron is a micronutrient, its application levels are very low. The color response is short-lived (typically two to three weeks) because the iron-induced color response in the leaves is removed by mowing.

**Management of Grass Clippings** - The recycling of grass clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Where aesthetics allow, all clippings from mowing events should be returned to the turf rather than discharging them onto sidewalks or streets. Clippings should not be blown onto impervious surfaces or surface waters, dumped down stormwater drains, or piled outside where rainwater will leach out the nutrients creating the potential for nutrient loss to the environment.

**Spreader Equipment Calibration** - Spreader equipment calibration is critical to NMP implementation. The landscape contractor should supply equipment calibration records to the campus Facility Manager on a routine basis.

#### 6.0 **RECORDKEEPING**

Proper NMP implementation requires diligent record keeping of fertilizer, lime and herbicide applications, and turfgrass conditions. Important information to retain with the plan includes soil tests reports; spreader settings; calibration results, dates of fertilizer application and rates applied; seeding or renovation; and unusual stresses caused by disease, drought, and pests. This information will also provide the background needed for future plan revisions. NMP Application record keeping forms are included in Appendix B for use for tracking fertilizer, lime, pesticide and herbicides.

#### 7.0 **REFERENCES**

Nutrient Management Training and Certification Regulations 4VAC50-85 (effective date November 23, 2014)

Virginia Nutrient Management Standards and Criteria (Revised July 2014): https://www.dcr.virginia.gov/document/standardsandcriteria.pdf

Urban Nutrient Management Handbook (August 16, 2019); 430-350: https://resources.ext.vt.edu/

A Spreadsheet-Based Soil Test Converter for Turfgrass Professionals and Nutrient Management Planning in Virginia (November 1, 2018); SPES-60P: <u>https://resources.ext.vt.edu/</u>

Soil Test Note #1 – Explanation of Soil Tests (December 1, 2018): <u>https://resources.ext.vt.edu/</u>

TABLES

#### Table 1: Soil Test Summary

	Site:	Anna	Annandale Campus – NOVA									
Te	sting Lab:	Way	Waypoint Analytical (Formerly A&L Eastern Laboratories)									
Sar	nple Date:	3/17	3/17/2021									
Soil Sampling Area ID	Square Feet	Soil pH (SU)	Buffer pH (SU)	P (Mehlich I) ppm	P (H/M/L)	K (Mehlich I) ppm	K (H/M/L)	Soil description	Turf Species			
AN-1	141,725	5.9	6.80	3	L	86	M+	Dark Brown, Sandy Clay Loam	Cool season, fescue			
AN-2	250,982	6.0	6.80	4	L	88	M+	Dark Brown, Sandy Clay Loam	Cool season, fescue			
AN-3	151,455	6.0	6.81	4	L	82	M+	Dark Brown, Sandy Loam	Cool season, fescue			
AN-4	54,413	6.1	6.85	1	L-	43	M-	Dark Brown, Sandy Loam	Cool season, fescue			

Notes: SU = Standard Units; ppm = parts per million; P and K ratings are from Virginia Nutrient Management Standards & Criteria. DNC\* = Buffer pH did not compute because the pH was above 6.2, according to Waypoint Analytical personnel.

#### Table 2: Nutrient Application Worksheet for Nutrient Management Area 1

Site: <u>Annandale Campus – NOVA</u> Begins: <u>7/15/2021</u> Expires: <u>7/15/2024</u> Nutrient Management Area: <u>1</u> Square Feet: <u>598,575</u> Landscape Plants: Cool Season Turf (Fescue)

Annual Nutrient Needs (lbs/1000 ft <sup>2</sup> ) <sup>1</sup>	Application Month/Day <sup>1,2</sup>	Amendment Material Notes	% Slow Release N	Total N	Total P205 (lbs/1000 ft <sup>2</sup> )	Total K20 (lbs/1000 ft <sup>2</sup> )	Lime Recommendation (lbs/1000 ft <sup>2</sup> ) <sup>3</sup>
	April 15-May 15	N – Fertilize & Lime	50% or greater	0.5	0	0	40
2.8*-2.5*-1.0*	Sept 1	Aerate, Overseed & Fertilize	50% or greater	0.9	1.0	0.50	
2.0"-2.3"-1.0"	Oct 1	Fertilize	50% or greater	0.9	1.0	0.25	
	Nov 1	Fertilize	50% or greater	0.5	0.5	0.25	
	Totals:			2.8	2.5	1.0	

Notes:

\* Up to 3.5 lbs. of nitrogen per 1000 ft<sup>2</sup> is allowed per the VNMS&C, but only 2.8 lbs. per 1000 ft<sup>2</sup> is recommended in this plan for consistency. Up to 3 lbs. of P2O5 per 1000 ft<sup>2</sup> is allowed per soil test results but only 2.0 lb. of P2O5 per 1000 ft<sup>2</sup> is recommended in this plan. Up to 2 lbs. of K2O per 1000 ft<sup>2</sup> is allowed per soil test results but only 1.0 lbs. of K2O per 1000 ft<sup>2</sup> is recommended in this plan.

1. Fertilizer recommendations are flexible if the following conditions are met: a) no more than 0.7 pounds of Water Soluble N per 1000 ft<sup>2</sup> is applied within a 30-day period; b) no more than 0.9 pounds of Total N (per 1000 ft<sup>2</sup>) may be applied within a 30-day period; c) no more than 0.5 pounds of N per 1000 ft<sup>2</sup> is applied for the April 15-May 15 and the November applications; and d) Total annual fertilizer amounts for each nutrient should not exceed the Annual Nutrient Needs listed in column 1.

2. The month and day designations are a general guideline. Apply as close to the month as possible, using the day designation to determine the interval between applications. 3. Lime applications are recommended in the amount of 40 lbs. per 1000  $ft^2$  for all soil sampling areas. Liming for successive years should be based on additional soil pH and buffer pH testing.

4. Do not apply inorganic fertilizers on frozen or snow-covered ground, or on denuded areas. Any fertilizer that makes its way onto impervious surfaces should be swept or blown back into pervious turfgrass – covered areas. Do not use fertilizers as ice melt.

5. Use a drop spreader for application of inorganic fertilizers on turf areas less than 10 feet wide or on slopes greater than 2%.

6. Apply pre and or post emergent herbicides as needed, but do not use fertilizer containing herbicide prior to April 15. Conditions must be met in Note 1.

**FIGURES** 

Figure 1: Project Location



Frederick With Frederick
(Wetland)
Studies and Solutions, Inc.
a DAVEY 🖳 company

Date: June 2021 Author: MGM Source: 2017-2019 VGIN VBMP Orthoimagery Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet

500	1,000 Feet

0

z

Annandale Campus Figure 1: Project Location NVCC NMP **Figure 2: Soil Sampling Areas** 

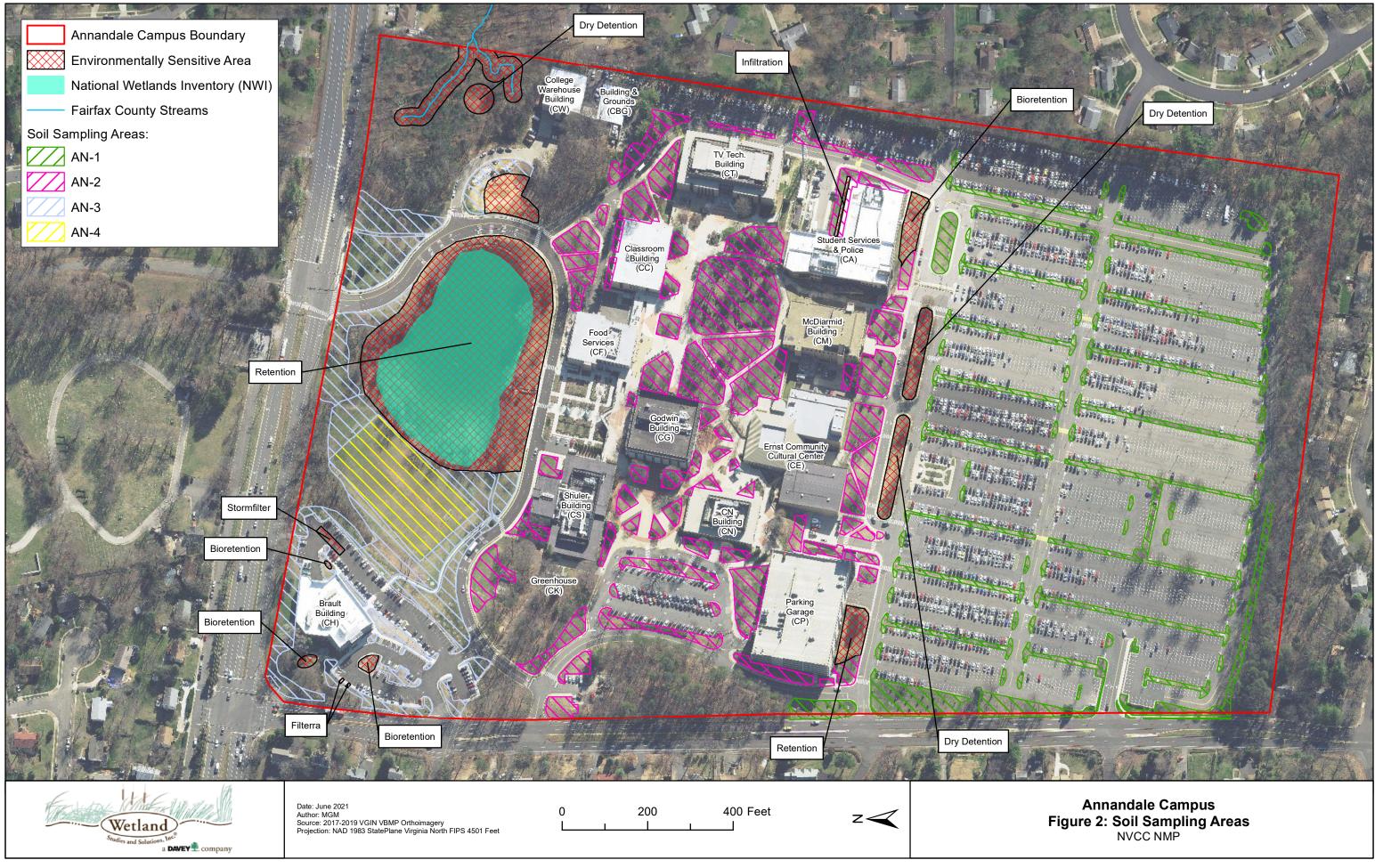


Figure 3: Nutrient Management Area

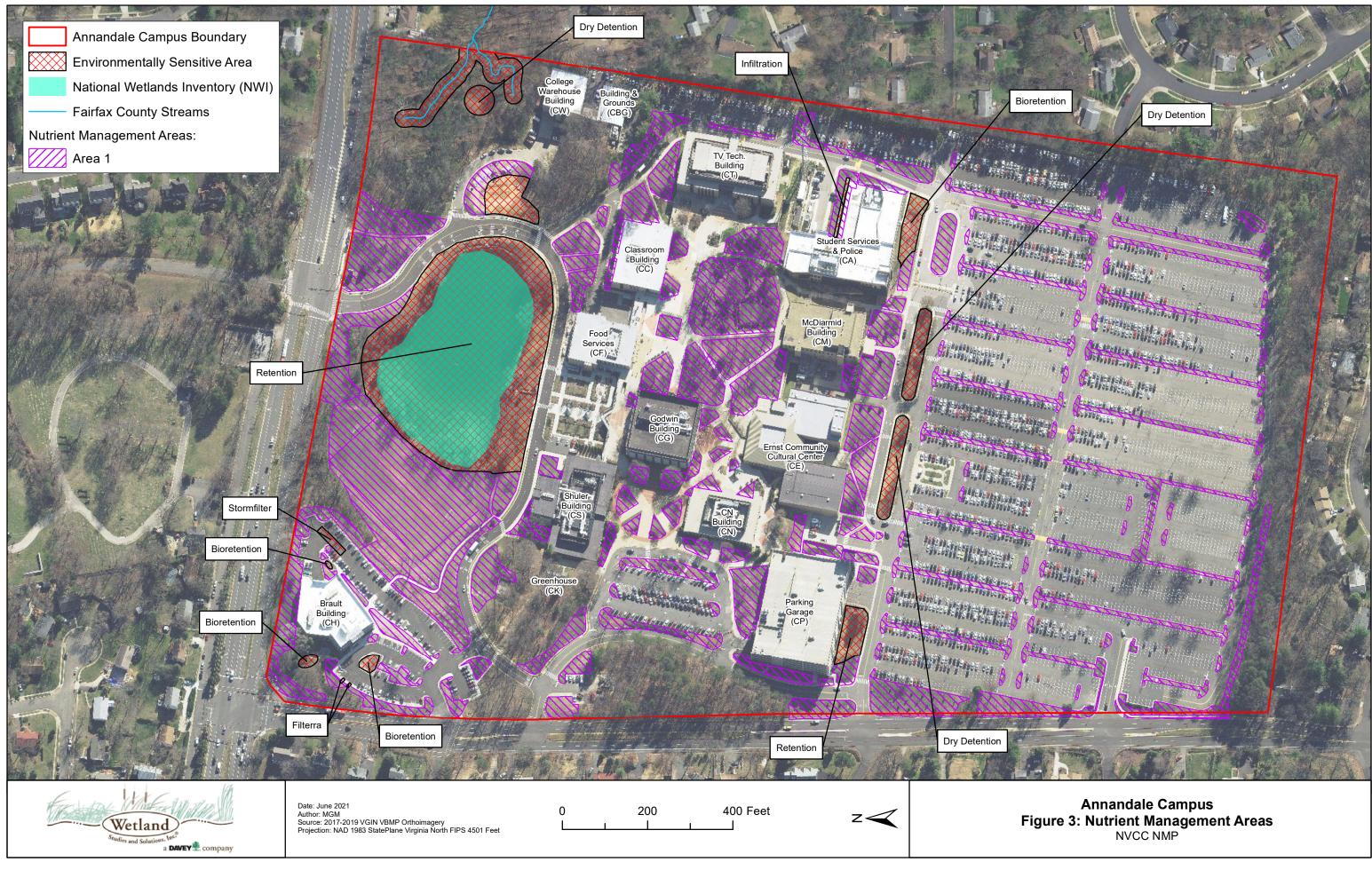
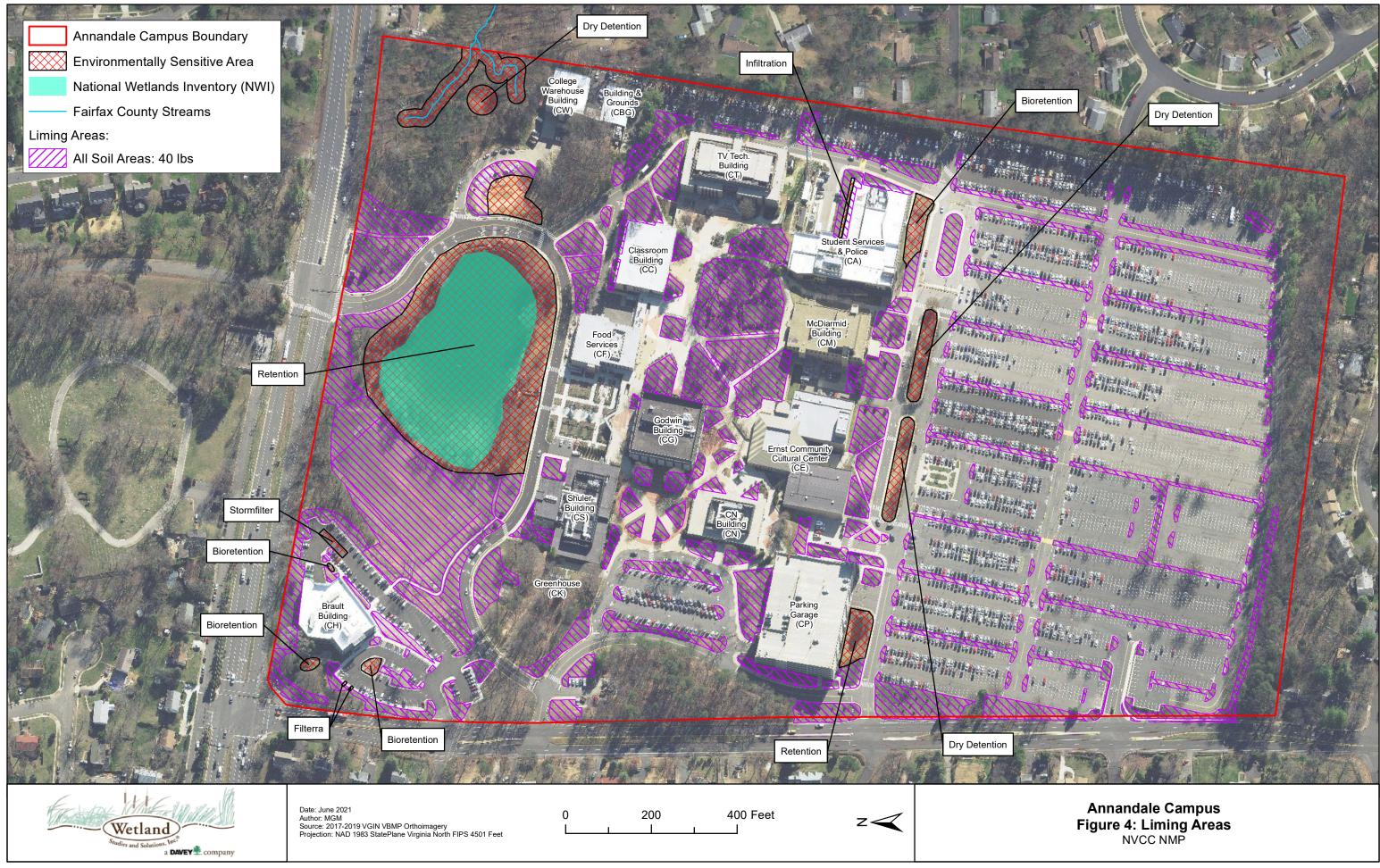


Figure 4: Liming Area



APPENDICES

Appendix A: Laboratory Soil Test Results

Page 1 of 1 Report Number: 21-078-0733 Account Number: 78934



7621 Whitepine Road, Richmond, VA 23237 Main 804-743-9401 ° Fax 804-271-6446 www.waypointanalytical.com

Send To: Wetlands Studies Solutions 201 Church Street Suite C Blacksburg VA 24060

Grower: NVCC Annandale 8333 Little River T

8333 Little River Turnpike Annandale VA 22003

SOIL ANALYSIS REPORT Analytic

"Every acre...Every year." TM

Analytical Method(s): SMP Buffer pH Mehlich 3 Loss On Ignition Water pH

Date Received: 0	03/19/2021		Dat	e Of Ar	nalysis: (	3/22/2021	Date Of	Report: 03/22	2/2021							
		O	n v	v/v	ENR		Phosphorus		Potassium	Magnesium	Calcium	Sodium	pł	н	Acidity	C.E.C
Sample ID Field ID	Lab Numbe	er % Rat		ioil ass	lbs/A	M3 ppm Rate	ppm Rate	ppm Rate	K ppm Rate	Mg ppm Rate	Ca ppm Rate	Na ppm Rate	Soil pH	Buffer Index	H meq/100g	meq/100g
AN-1	19581	4. M			133	13 VL			121 M	193 H	858 M		5.9	6.80	1.3	7.5
AN-2	19582	5.0 H			138	15 L			124 M	210 H	1033 M		6.0	6.80	1.3	8.5
AN-3	19583	4.8 M			135	15 L			115 M	169 H	1017 M		6.0	6.81	1.2	8.0
AN-4	19584	3.8 M			118	9 VL			60 L	145 H	738 M		6.1	6.85	0.8	5.9
		Percent Base Satu				Nitrate Sulfur Zin		Zinc	Manganese	Iron	Copper	Boron	Soluble	Salts		
Sample ID Field ID	К %	Mg %	Ca %	Na %	H %	NO <sub>3</sub> N ppm Rate	S ppm Rate	Zn ppm Rate	Mn ppm Rate	Fe ppm Rate	Cu ppm Rate	B ppm Rate	SS ms/cm			
AN-1	4.1	21.4	57.2		17.3											
AN-2	3.7	20.6	60.8		15.3											
AN-3	3.7	17.6	63.6		15.0											
AN-4	2.6	20.5	62.5		13.6											

Values on this report represent the plant available nutrients in the soil. Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High). ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams). Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to sample(s) tested. Samples are retained a maximum of thirty days after testing.

by: Pauric MC Groary

Analysis prepared by: Waypoint Analytical Virginia, Inc.

Pauric Mc Groary Ph.D., CPAg

**Appendix B: Application Record Forms** 

	Fertilizer Application Records												
	Customer In	formation				Μ	lanagement	t Area Information					
Name:					Mana	agement Are	ea ID:						
					Manag	gement Area	a Size:						
Address:					Та	arget Species	s:						
					Notes:								
	Supervisor/Applicator	Weather Conditions											
Date		Temp	Wind Speed	Precip	Fertilizer Analysis	Rate	Amount Fe	ertilizer Used (1000 lbs/AC)	Application Equipment Used				
	s the last time your fertilize ent Handbook". Available							apter 10 of the "Urba	an Nutrient				

	Lime Application Records											
	Customer In	formation				М	anagement	Area Information				
Name:					Mana	gement Are	a ID:					
					Manag	gement Area	a Size:					
Address:					Notes:							
	Supervisor/Applicator	Wea	ather Condit	tions		Rate						
Date		Temp	Wind Speed	Precip	Lime Analysis			unt Lime Used 000 lbs/AC)	Application Equipment Used			
	the last time your fertilize ent Handbook". Available							pter 10 of the "Urba	an Nutrient			

	Herbicide Application Records											
	Customer In	formation				М	lanagement	t Area Information				
Name:					Mana	agement Are	ea ID:					
					Manag	gement Area	a Size:					
Address:					Та	arget Species	s:					
					Notes:							
	Supervisor/Applicator	Weather Conditions										
Date		Temp	Wind Speed	Precip	Herbicide Analysis	Rate	Amoun	t Herbicide Used	Application Equipment Used			
	s the last time your fertilize ent Handbook". Available							apter 10 of the "Urba	an Nutrient			

	Pesticide Application Records												
	Customer In	formation				М	lanagement	t Area Information					
Name:					Mana	agement Are	ea ID:						
			a Size:										
Address:					Та	arget Species	s:						
					Notes:								
	Supervisor/Applicator	Weather Conditions											
Date		Temp	Wind Speed	Precip	Pesticide Analysis	Rate	Amoun	nt Pesticide Used	Application Equipment Used				
	the last time your fertilize ent Handbook". Available							apter 10 of the "Urba	an Nutrient				