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COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

July 29, 2021

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

Your nutrient management plan (NMP) dated 7/15/2021 for Northern Virginia Community College Woodbridge Campus located in Prince William County has been approved by the Virginia Department of Conservation and Recreation (DCR). The approved plan is for 11.57 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,

A handwritten signature in cursive script that reads "Anita Tuttle".

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

Nutrient Management Plan For the Woodbridge Campus Northern Virginia Community College

Prepared for:

**Northern Virginia Community College
Facilities Planning & Support Services, CW 312
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 | <i>15200 Neabsco Mills Rd</i> |
| City State Zip | <i>Woodbridge, VA 22191</i> |
| Coordinates | <i>+38 37' 6.91"</i> |
| NAD 83 Deg Min Sec | <i>- 77 17' 35.79"</i> |
| VAHU6 Watershed Code | <i>PL49 – Neabsco Creek</i> |
| County | <i>Prince William</i> |
| Square Footage of Management Areas | |
| Total | <i>11.57 (504,307 ft²)</i> |
| Area 1 | <i>11.57 acres (504,307 ft²)</i> |
| Plan Start Date | <i>July 15, 2021</i> |
| Plan End Date | <i>July 15, 2024</i> |
| Planner Signature | <i>Sara Rilveria</i> |

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1.0 INTRODUCTION AND SITE DESCRIPTION

1.1 Introduction

This Nutrient Management Plan (NMP) is for the Woodbridge Campus of the Northern Virginia Community College (NOVA) located in Prince William County, Virginia just east of I-95 (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 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 111-acre Woodbridge Campus contains turfgrass in many areas including around campus buildings, along roadways, and around and within parking lots. The Woodbridge Campus contains many turfed medians in the parking lots. 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, areas with better topsoil and more gently sloping or level terrain have higher quality turf conditions than those areas with strongly sloping conditions and poor topsoil. The campus contains many turf areas with large denuded areas, thin topsoil, steep slopes, and over-compacted soil. These problem areas, which are addressed in Section 3.2, are generally located in the northeastern parking lot medians and the area between the road and the parking lot east of Campus Drive.

Turfgrass areas with irrigation include: the turf circle located to the east of the Arts and Sciences Building, a portion of the field south of the Arts and Sciences Building, a portion of the landscaped median to the north of the Seefeldt Building, and turf and landscaped areas in the immediate vicinity of the Workforce Development Center. The remainder of the turf is not irrigated.

Several environmentally sensitive areas are located at the Woodbridge Campus. A large retention basin located in the western portion of the property (Figure 2) is fed from and drains to an intermittent stream that flows into Neabsco Creek. Both portions of the intermittent stream are in wooded areas. Section 4 addresses environmentally sensitive areas.

1.3 Current and Future Turf Maintenance

A landscaping maintenance contractor performs most turf management including all nutrient applications. The Landscape Supervisor applies some herbicides. 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 of the soils in the turf areas have been modified by cut and fill activities, the soils still retain most of the characteristics presented in the U.S. Department of Agriculture (USDA) soil survey, and may still be classified as sandy loams to sandy clay loams. Soils in many areas were compacted to very compacted with thin amounts of topsoil.

Soil samples were collected on March 18, 2021 from three (3) 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. 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 ratings ranged from L- to M-. Potassium concentrations ranged from M to H-. Soil pH ranged from 5.4 to 6.1 Standard Units (SU), with all samples having a pH below the target level of 6.2 for cool season turf.

3.0 NUTRIENT MANAGEMENT AREAS

Based on the soil test results, current turf conditions, the intensity of use, and overall visibility and aesthetic considerations, two Nutrient Management Areas (NMA) at the Woodbridge Campus have been 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. Figures 3 and 4 show the nutrient management area and the liming areas, respectively. Tables 2a and 2b present the application schedule for the nutrient management and liming areas, discussed in greater detail in Section 3.1 below.

NMA 1 contains approximately 11.57-acres.

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, and therefore, 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 are based on the VNMS&C. This NMP uses the most restrictive application rate for each NMA 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 Woodbridge 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 12. Although aggressive spring and summer nitrogen fertilization can result in lush, dark green foliage, this occurs at the expense of the turf 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 April to May 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 the soil test pH and the buffer indices. Based on the soil samples, lime applications are recommended for portions of the campus during the first year of this NMP. Table 2 lists liming schedules and application rates, and Figure 4 shows the areas requiring lime.

Based on the soil sampling results, soil sample area WO-1 requires one application of lime at 40 pounds per 1000 ft² and soil sampling areas WO-2 and WO-3 require two applications to achieve 60 pounds per 1000 ft². These liming recommendations are only for the first year following soil sampling. The soil should be tested for soil pH and Buffer pH in the late fall to winter each following year to determine if additional annual liming is necessary after the initial recommended liming.

3.2 Problem Turfgrass Areas and Temporarily Inactive Nutrient Management Areas

Turf areas with ineffective groundcover including turfgrass in poor condition or has been recently seeded remain at the site. The poor turfgrass or groundcover conditions are the result of poor soil quality, over-compaction, active erosion, or shading and poor soil moisture conditions caused by nearby trees. These problem areas are generally located in the northeastern parking areas and the large median and parking medians located east of Campus Drive. Any areas with ineffective groundcover should 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 the respective NMA for nutrient recommendations.

3.3 Permanent Inactive Management Areas

It is recommended that the Campus Lake dam and the adjacent sanitary sewer easement (See Figures 2, 3, and 4) be taken out of fescue turfgrass management permanently with no application of fertilizers and herbicides. The Campus Lake dam currently has a dense cover of low growing vegetation consisting of a mixture of grasses and herbaceous plants. The area should be periodically inspected to ensure adequate vegetation coverage and absence of erosion or seepage. Due to the proximity of the dam to the lake and the tributary to Neabsco Creek, no fertilizers or herbicides should be applied unless a specific vegetative cover concern develops. The dam should be mowed less frequently to a height between four to eight inches to discourage woody growth and to facilitate visual inspection for seepage, sloughs or other signs of stress.

3.4 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 2a, the landscape contractor may use their discretion with the exact ratio of nutrients applied per application.

3.5 Pre- and Post-Emergent Herbicides

Weed control is a necessary requirement for healthy turf and has been implemented in the past at the Woodbridge 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.

General precautions for fertilizer application include:

- 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 Woodbridge Campus as shown on Figures 2 through 6:

- A retention basin at the western portion of the property
- An intermittent stream that drains into the retention basin and then continues south to an unnamed tributary to Neabsco Creek. Both portions of the intermittent stream are in wooded areas.
- Another unnamed tributary to Neabsco Creek that runs south along the eastern portion of the property
- A detention basin south of the south parking lot
- A bioretention facility at the WFM yard
- A Stormfilter east of the WB 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 area southeast of the lake contains virtually no vegetated buffer and two areas adjacent of the lake near wooden gazebos and picnic areas are completely bare of ground cover or turf. It is recommended that a vegetated buffer be installed in these areas to improve water quality. Turf in and around the detention basin should be mowed at a greater height.

It is noted that identification of sensitive natural resources areas such as wetlands and streams is based on the publicly available National Hydrologic Dataset and the U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory Maps. Field mapping of other wetlands and streams that may exist on the campus was outside the scope of this NMP.

5.0 OTHER TURF MANAGEMENT CONSIDERATIONS

Aeration - Extensive core cultivation/aeration in the late summer to early fall is recommended for the Woodbridge 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 – Refer to the most recent Virginia Cooperative Extension’s *Virginia Turfgrass Variety Recommendations* found online at <https://www.sites.ext.vt.edu/newsletter-archive/turfgrass/index.html> 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 Woodbridge 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 warm-season 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 allows, 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: <https://resources.ext.vt.edu/>

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

TABLES

Table 1: Soil Test Summaries

| Site: Woodbridge Campus – NOVA | | | | | | | | | |
|--|-------------|--------------|------------------|---------------------|-----------|---------------------|-----------|------------------------|---------------------|
| Testing Lab: Waypoint Analytical (Formerly A&L Eastern Laboratories) | | | | | | | | | |
| Sample Date: 03/18/2021 | | | | | | | | | |
| Soil Sampling Area ID | Square Feet | Soil pH (SU) | Buffer pH (S.U.) | P (Mehlich I) (ppm) | P (H/M/L) | K (Mehlich I) (ppm) | K (H/M/L) | Soil description | Turf Species |
| WO-1 | 60,189 | 6.1 | 6.79 | 7 | M- | 99 | H- | Brown, Sandy Loam | Cool season, fescue |
| WO-2 | 214,511 | 5.4 | 6.67 | 10 | M- | 74 | M | Brown, Sandy Clay Loam | Cool season, fescue |
| WO-3 | 229,607 | 5.4 | 6.68 | 1 | L- | 60 | 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: Woodbridge Campus – NOVA

Begins: 7/15/2021 Expires: 7/15/2024

Nutrient Management Area: 1

Square Feet: 555,867

Landscape Plants: Cool Season Turf (Fescue)

| Annual Nutrient Needs (lbs/1000 ft ²) ¹ | Application Month/Day ^{1,2} | Amendment Material Notes | % Slow Release N | Total N | Total P ₂ O ₅ (lbs/1000 ft ²) | Total K ₂ O (lbs/1000 ft ²) | Lime Recommendation (lbs/1000 ft ²) ³ |
|--|--------------------------------------|------------------------------|------------------|------------|---|--|--|
| 2.8*-2.0*-1.0* | April 15-May 15 | N - Fertilize & Lime | 50% or greater | 0.5 | 0 | 0 | 0 |
| | Sept 1 | Aerate, Overseed & Fertilize | 50% or greater | 0.9 | 0.75 | 0.5 | 40 (WO-1) 40 (WO-2, WO-3) |
| | Oct 1 | Fertilize | 50% or greater | 0.9 | 0.75 | 0.25 | |
| | Nov 1 | Fertilize | 50% or greater | 0.5 | 0.5 | 0.25 | 20 (WO-2, WO-3) |
| | Totals: | | | 2.8 | 2.0 | 1.0 | |

Notes:

*Up to 3.5 lbs. of nitrogen per 1000 ft² is allowed for this NMA per the VNMS&C, but only 2.8 lbs per 1000 ft² is recommended in this plan. Up to 3.0 lbs. of P₂O₅ per 1000 ft² is allowed per soil test results but only 2 lbs. of P₂O₅ per 1000 ft² is recommended in this plan. Up to 1.5 lbs. of K₂O per 1000 ft² is allowed per soil test results but only 1.0 lbs. of K₂O per 1000 ft² is recommended in this plan.

1. Fertilizer recommendations are flexible provided the following conditions are met: a) no more than 0.7 pounds of Water Soluble N per 1000 ft² is applied within a 30-day period; b) no more than 0.9 pounds of Total N (per 1000 ft²) may be applied within a 30-day period; and c) 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 one application of 40 lbs. per 1000 ft² for soil sampling area WO-1 and two applications to equal a total of 60 lbs. per 1000 ft² for soil sampling areas WO-2 and WO-3. Lime areas are shown on Figure 4. Lime applications are for the first year of soil sampling only. 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 15th. Conditions must be met in Note 1.

FIGURES

Figure 1: Project Location

Woodbridge Campus Boundary



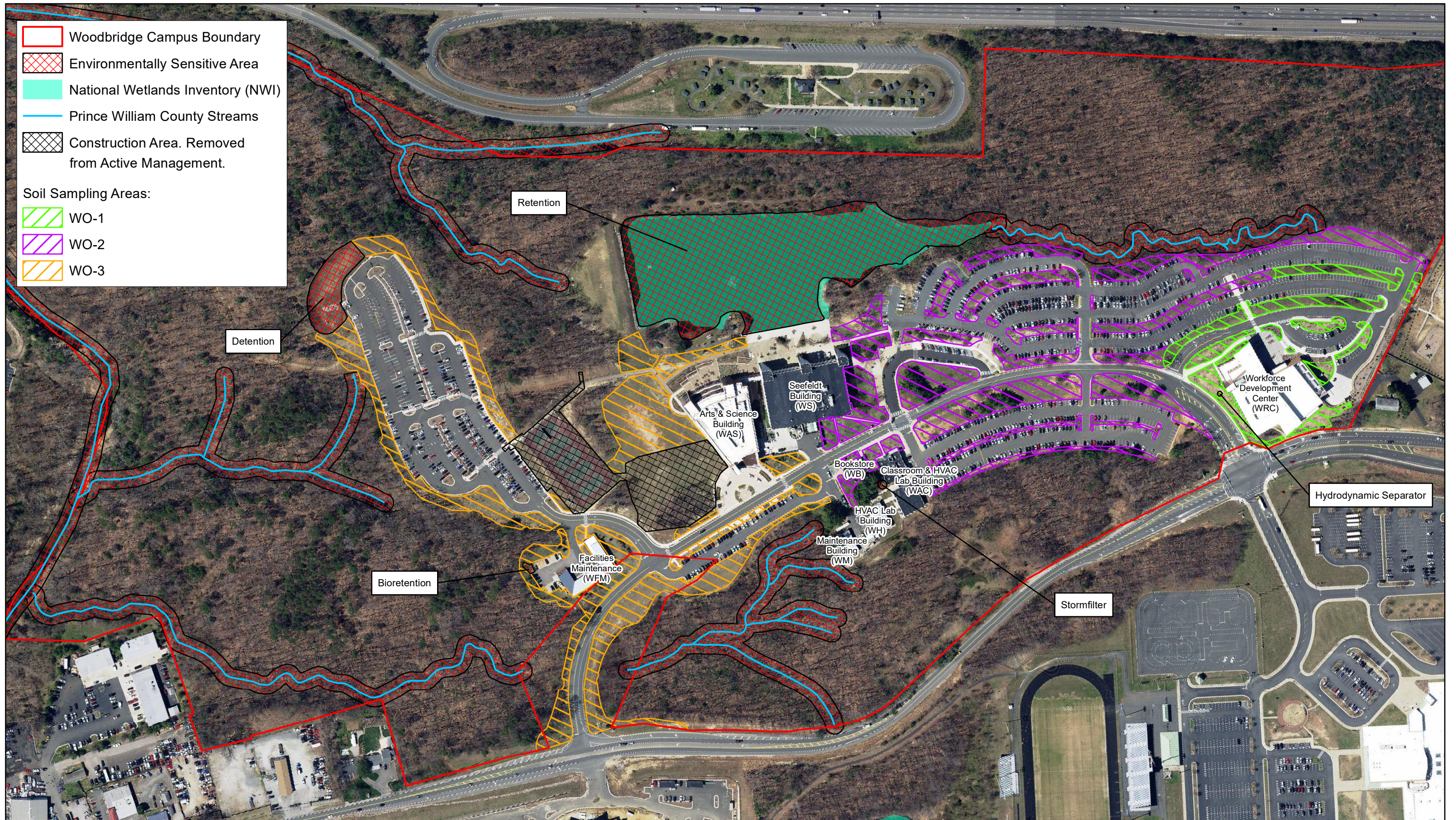
Date: June 2021
Author: MGM
Source: 2017-2019 VGIN VBMP Orthoimagery
Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet

0 500 1,000 Feet

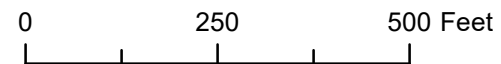


Woodbridge Campus
Figure 1: Project Location
NVCC NMP

Figure 2: Soil Sampling Areas

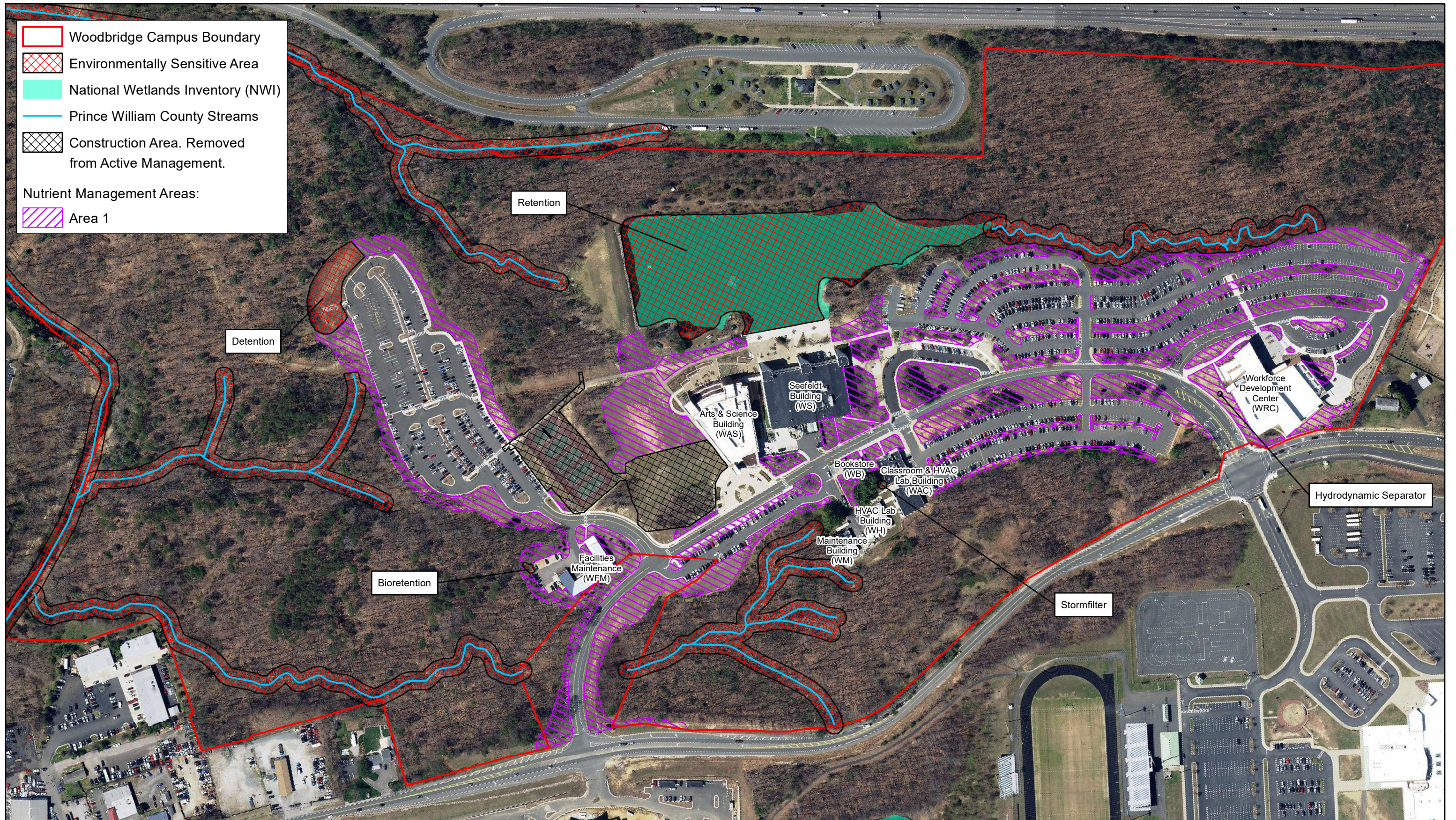


Date: June 2021
 Author: MGM
 Source: 2017-2019 VGIN VBMP Orthoimagery; NWI Wetlands;
 Prince William County Streams; NHD Streams
 Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet



Woodbridge Campus
Figure 2: Soil Sampling Areas
 NVCC NMP

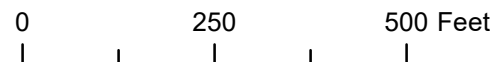
Figure 3: Nutrient Management Area



Woodbridge Campus Boundary
 Environmentally Sensitive Area
 National Wetlands Inventory (NWI)
 Prince William County Streams
 Construction Area. Removed from Active Management.
 Nutrient Management Areas:
 Area 1

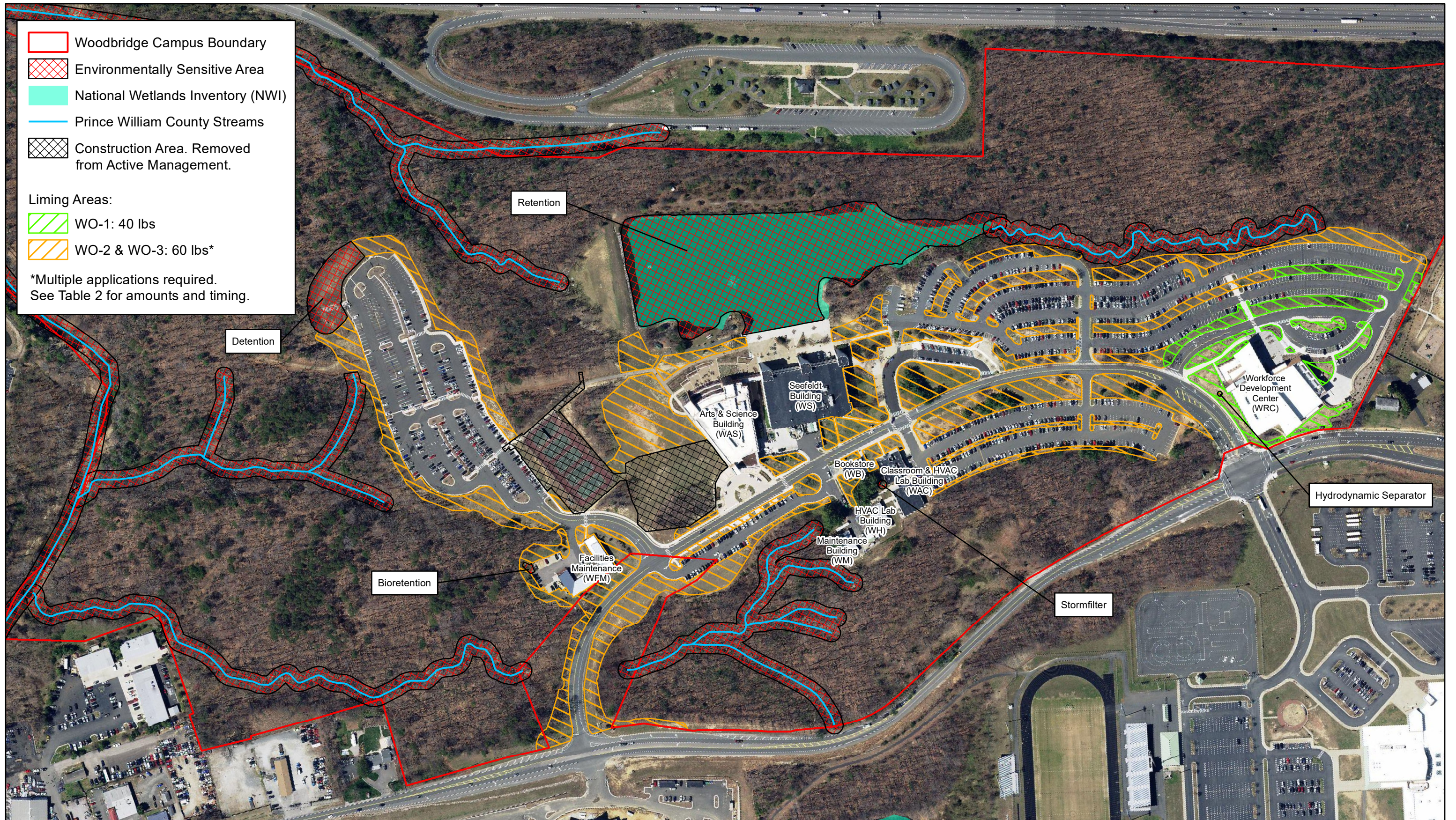


Date: June 2021
 Author: MGM
 Source: 2017-2019 VGIN VBMP Orthoimagery; NWI Wetlands;
 Prince William County Streams; NHD Streams
 Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet



Woodbridge Campus
Figure 3: Nutrient Management Areas
 NVCC NMP

Figure 4: Liming Requirements



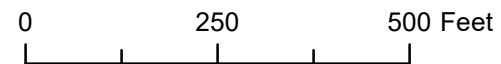
Woodbridge Campus Boundary
 Environmentally Sensitive Area
 National Wetlands Inventory (NWI)
 Prince William County Streams
 Construction Area. Removed from Active Management.

Liming Areas:
 WO-1: 40 lbs
 WO-2 & WO-3: 60 lbs*

*Multiple applications required.
 See Table 2 for amounts and timing.



Date: June 2021
 Author: MGM
 Source: 2017-2019 VGIN VBMP Orthoimagery; NWI Wetlands;
 Prince William County Streams; NHD Streams
 Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet



Woodbridge Campus
Figure 4: Liming Areas
 NVCC NMP

APPENDICES

Appendix A: Laboratory Soil Test Results

Report Number: 21-078-0732

Account Number: 78934



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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 Woodbridge
 2645 College Drive
 Woodbridge VA 22191

SOIL ANALYSIS REPORT

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

Date Received: 03/19/2021

Date Of Analysis: 03/22/2021

Date Of Report: 03/22/2021

| Sample ID Field ID | Lab Number | OM | W/V | ENR | Phosphorus | | | Potassium | Magnesium | Calcium | Sodium | pH | | Acidity | C.E.C |
|-----------------------|---------------|-----------|---------------|-------|----------------|----------|----------|---------------|----------------|----------------|----------------|------------|-----------------|---------------|----------|
| | | % Rate | Soil Class | 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 |
| WO-1 | 19578 | 5.7 H | | 149 | 23 L | | | 140 M | 186 H | 1384 M | | 6.1 | 6.79 | 1.4 | 10.2 |
| WO-2 | 19579 | 4.6 M | | 129 | 28 L | | | 104 M | 145 M | 1039 M | | 5.4 | 6.67 | 2.6 | 9.3 |
| WO-3 | 19580 | 3.5 M | | 107 | 10 VL | | | 85 L | 139 M | 992 M | | 5.4 | 6.68 | 2.5 | 8.8 |

| Sample ID Field ID | Percent Base Saturation | | | | | Nitrate | Sulfur | Zinc | Manganese | Iron | Copper | Boron | Soluble Salts | | |
|-----------------------|-------------------------|---------|---------|---------|--------|-------------------------------|---------------|----------------|----------------|----------------|----------------|---------------|------------------|--|--|
| | K % | Mg % | Ca % | Na % | H % | NO ₃ N ppm Rate | S ppm Rate | Zn ppm Rate | Mn ppm Rate | Fe ppm Rate | Cu ppm Rate | B ppm Rate | SS ms/cm Rate | | |
| WO-1 | 3.5 | 15.2 | 67.8 | | 13.7 | | | | | | | | | | |
| WO-2 | 2.9 | 13.0 | 55.9 | | 28.0 | | | | | | | | | | |
| WO-3 | 2.5 | 13.2 | 56.4 | | 28.4 | | | | | | | | | | |

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.

Analysis prepared by: Waypoint Analytical Virginia, Inc.

by: *Pauric Mc Groary*

Pauric Mc Groary Ph.D., CPAg

Appendix B: Application Record Forms

Fertilizer Application Records

| Fertilizer Application Records | | | | | | | | | |
|--------------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|--------------------------------------|----------------------------|--|
| Customer Information | | | | | Management Area Information | | | | |
| Name: | | | | | Management Area ID: | | | | |
| Address: | | | | | Management Area Size: | | | | |
| | | | | | Target Species: | | | | |
| | | | | | Notes: | | | | |
| Date | Supervisor/Applicator | Weather Conditions | | | Fertilizer Analysis | Rate | Amount Fertilizer Used (1000 lbs/AC) | Application Equipment Used | |
| | | Temp | Wind Speed | Precip | | | | | |
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When was the last time your fertilizer equipment was calibrated??? For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook". Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>

Lime Application Records

| Lime Application Records | | | | | | | | | |
|--------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|-----------------------------------|----------------------------|--|
| Customer Information | | | | | Management Area Information | | | | |
| Name: | | | | | Management Area ID: | | | | |
| Address: | | | | | Management Area Size: | | | | |
| | | | | | Notes: | | | | |
| Date | Supervisor/Applicator | Weather Conditions | | | Lime Analysis | Rate | Amount Lime Used (1000 lbs/AC) | Application Equipment Used | |
| | | Temp | Wind Speed | Precip | | | | | |
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When was the last time your fertilizer equipment was calibrated??? For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook". Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>

Herbicide Application Records

| Herbicide Application Records | | | | | | | | | |
|-------------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|-----------------------|----------------------------|--|
| Customer Information | | | | | Management Area Information | | | | |
| Name: | | | | | Management Area ID: | | | | |
| Address: | | | | | Management Area Size: | | | | |
| | | | | | Target Species: | | | | |
| | | | | | Notes: | | | | |
| Date | Supervisor/Applicator | Weather Conditions | | | Herbicide Analysis | Rate | Amount Herbicide Used | Application Equipment Used | |
| | | Temp | Wind Speed | Precip | | | | | |
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When was the last time your fertilizer equipment was calibrated??? For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook". Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>

Pesticide Application Records

| Customer Information | | | | | Management Area Information | | | |
|----------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|-----------------------|----------------------------|
| Name: | | | | | Management Area ID: | | | |
| Address: | | | | | Management Area Size: | | | |
| | | | | | Target Species: | | | |
| | | | | | Notes: | | | |
| Date | Supervisor/Applicator | Weather Conditions | | | Pesticide Analysis | Rate | Amount Pesticide Used | Application Equipment Used |
| | | Temp | Wind Speed | Precip | | | | |
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When was the last time your fertilizer equipment was calibrated??? For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook". Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>