

Chapter 5

Nutrient Management Plans

Virginia Department of Transportation

Lynchburg District

Lynchburg District Roadside Manager

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*This district does not contain rest areas.

**Nutrient Management Plan for VDOT
Ia. Permanent Facilities: Lynchburg District**

Site: Lynchburg District Office Complex

4219 Campbell Ave
Lynchburg, VA 24501
Louis R. "Ray" Lacy

Campbell County

DCR Watershed Code H05

5.45 Acres

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Signature



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Valid until 07-1-09

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Ia. Lynchburg District Office Complex Nutrient Management Plan

The Virginia Department of Transportation (VDOT) agrees to comply with all requirements set forth in the Nutrient Management Training and Certification Regulations, 4 VAC 5-15-10 *et seq.*, and to follow recommendations for turf fertilization and management as described in the Virginia Nutrient Management Standards and Criteria, Revised October 2005. This includes implementing the Department of Conservation and Recreation’s approved **Nutrient Management Plan**, and submitting an **Annual Activity Report**. All nutrient applications performed by VDOT staff shall comply with the provisions of this Nutrient Management Plan as of July 1, 2006. Any contracts bid on or after July 1, 2006, must comply with this Nutrient Management Plan. Nutrient applications performed by those already under contract or bid prior to July 1, 2006 must comply with this Plan by July 1, 2007.

1. Site Description & Supporting Information

This nutrient management plan was written to accommodate the fertility management of turf surrounding this office complex. The data and information presented in this plan were compiled by Jody Booze-Daniels and W. Lee Daniels, CSES Dept., Virginia Tech. 540-231-7175; wdaniels@vt.edu. The following table provides specific site descriptions:

Site Title	Lynchburg District Office Complex
Site Address	4219 Campbell Ave Lynchburg, VA 24501
Acreage	5.45
Soil Type	Udorthents
Environmentally Sensitive Areas	Analysis of soil and landscape features in the immediate vicinity of this nutrient management plan area was done via analysis of soil maps, topographic maps, aerial photography and local confirmation by VDOT personnel. No such features or areas as defined in sections 1A and 1B the 2005 Virginia Nutrient Management Standards and Criteria were noted. However, this plan was developed such that the rate and timing of nutrient applications safeguards water quality and the plan is appropriate for use in environmentally sensitive areas.

Soil Types: Virtually all portions of VDOT Permanent Facilities that receive fertilizers are drastically disturbed cut/fill landscapes which are mapped by USDA-NRCS as either “Udorthents” or “made land”. Therefore, it is impossible to assign conventional soil series and associated soil productivity groupings for nutrient management planning. Due to their general lack of native topsoil covers, and frequent occurrence of

compaction and poor soil structure, all soils managed by VDOT are assigned to **Productivity Group III or IV** for the purpose of nutrient management planning.

Soil Sampling Requirements: Take 20 or more sub-samples from the upper 4” of soil, from different locations within each uniform sampling area to make a composite sample. Take the sub-samples in a random manner, such as with a zigzag pattern to minimize the variability that may be present in your sampling area. This allows you to obtain a reasonably representative soil sample. Soil samples must be analyzed for pH, phosphorus, and potassium.

The larger the area, the more sub-samples that are needed. The more sub-samples you take, the more representative your sample will be of your landscape area. When you realize that your 1/2 pound composite sample could represent up to 2 million pounds of soil, you can understand why proper sampling is so important.

When you have taken sufficient sub-samples from a uniform area, thoroughly mix the sub-sample slices or cores, breaking up clumps and removing all foreign matter such as roots, stalks, rocks, etc. (<http://www.soiltest.vt.edu>)

2. Site Soil Test Summary and Results

Soil Test Data: Lynchburg District Office Complex

Code	Date of Test	Soil pH	Buffer pH of Soil (BpH)	P ppm	Range	K ppm	Range
LDOLN	3/13/2006	6.18	6.34	141	VH	123	H

RESEARCH

VIRGINIA COOPERATIVE EXTENSION
SOIL TESTING LABORATORY

Person: BURGER DANIELS
Submitting: 250 SMYTH HALL
Samples: CSES DEPT

Unit: VPI &

LABORATORY RESULTS

Sample ID	Lab ID	pH	BpH	P	K	Ca	Mg	Zn	Mn	Cu	Fe	B	mg/lb og		%		K Sat	
													Est. CEC	Acidity	Base Sat	Ca Sat		
00001	19473	5.38	6.06	112	143	674	134	9.2	11.4	1.5	13.8	0.4	6.8	29.5	70.5	49.1	16.1	5.3
00002	19474	5.53	6.03	108	116	623	121	9.2	10.4	1.1	15.1	0.4	6.6	33.3	66.7	47.1	15.1	4.5
01B	19475	8.25	N/A	342	193	1399	132	2.0	18.9	1.3	175.2	0.5	8.6	N/A	100.0	81.6	12.7	5.8
02B	19476	7.65	N/A	338	175	1452	134	3.2	24.8	1.5	162.8	0.9	8.8	N/A	100.0	82.4	12.5	5.1
03B	19477	7.42	N/A	243	139	1370	127	6.2	35.8	2.0	98.6	1.8	8.2	N/A	100.0	83.0	12.7	4.3
04B	19478	7.72	N/A	287	197	1265	182	2.3	39.0	1.5	151.7	0.6	8.3	N/A	100.0	75.9	18.0	6.1
05B	19479	7.40	N/A	214	173	1354	183	6.0	48.1	2.3	98.8	1.8	8.7	N/A	100.0	77.6	17.3	5.1
06B	19480	7.21	N/A	181	136	1243	189	6.1	47.5	1.5	77.9	2.0	8.1	N/A	100.0	76.5	19.2	4.3
07B	19481	7.19	N/A	229	157	1290	280	2.7	58.7	3.4	125.7	0.6	9.1	N/A	100.0	70.4	25.2	4.4
LDOLN	19472	6.18	6.34	141	123	1547	128	4.9	16.6	0.5	10.6	0.5	9.4	3.8	96.2	81.8	11.1	3.3

3. Site Map: Areas of managed turf within the **Lynchburg Office Complex** are outlined.



4. Nutrient & Lime Recommendations and Nutrient Application Worksheet

Appropriate soil sampling and analysis is essential for effective nutrient management planning. In order to maximize fertilizer effectiveness and uptake efficiency, soil pH must be adjusted to the optimal range of 6.0 to 6.5 whenever fertilizers are applied.

Modifications to lime and nutrient recommendations for VDOT Permanent Facilities will be based upon an appropriate recent (≤ 1 year) soil sample analysis and a revised Nutrient Management Plan must be submitted and approved.

Nutrient Recommendations:

Nitrogen Fertilizer: The rate is limited to 45 lb nitrogen /acre (1 lb/1000 ft²) at each application and separated by at least 30 days. A maximum of 90 lb/A (2 lb/1000 ft²) of 100 % water soluble nitrogen (WSN) may be applied per year. Cool season grasses should receive at least 75% of their total fertilizer in the fall and the warm season grasses should receive 100% of their fertilizer during the summer. Do not apply fertilizer during periods of drought. Slowly available N (water insoluble nitrogen – WIN) may be used and is strongly encouraged. The application rates of a fertilizer that has at least 30% WIN can be raised to 60lb nitrogen per acre per application. Areas in heavy shade (more than 60% of the day) or low traffic may need only ½ the fertilizer of the full sun areas.

Phosphorus and Potassium Fertilizers: Apply each fertilizer (P₂O₅ and K₂O) as indicated necessary by soil test using the following table for Soil Productivity Groups III and IV.

The amount of P₂O₅ & K₂O that may be applied according to appropriate soil test levels.

Soil Test (Va Tech)	P ₂ O ₅		K ₂ O	
	lb/A	lb/1000ft ²	lb/A	lb/1000ft ²
L	90-100	2.00-2.25	90-100	2.00-2.25
M-	75-90	1.75-2.00	75-90	1.75-2.00
M	55-75	1.25-1.75	55-75	1.25-1.75
M+	40-55	1.00-1.25	40-55	1.00-1.25
H	0	0	0	0
VH	0	0	0	0

Liming Recommendations:

For normal soil materials, liming recommendations will be based upon standard agronomic criteria to maintain soil pH between 6.0 and 6.5. Lime rates are based on Tables 3-1 and 3-3 in the Virginia Nutrient Management Standards and Criteria, Revised October 2005.

For sulfidic materials (see Orndorff and Daniels, 2002 for maps and definitions) or **any** soil sample with a water pH < 4.0, liming recommendations must be based on reactive potential acidity or acid-base-accounting analysis.

Citation: Orndorff, Z.W. and W.L. Daniels, 2002. Delineation and Management of Sulfidic Materials in Virginia Highway Corridors, Final Contract Report VTRC 03-CR3. Virginia Trans. Res. Council, Charlottesville, VA. <http://vtrc.virginiadot.org/PubDetails.aspx?PubNo=03-CR3>

Nutrient & Lime Application Worksheet

Agency: VDOT Lynchburg District	Area: District Office
Date Prepared: 6/1/06	Size: 5.45 A

Maximum Rates of Fertilizer Application					
Month and Year*	Fertilizer to apply lb/A (lb/1000 ft ²)	Fertilizer analysis N-P-K	Nitrogen to apply lb/A (lb/1000 ft ²)	P ₂ O ₅ to apply lb/A (lb/1000 ft ²)	K ₂ O to apply lb/A (lb/1000 ft ²)
8/15 to 10/15 2006	96 (2.2)	46-0-0	45 (1)	VH 0	H 0
8/15 to 10/15 2007	96 (2.2)	46-0-0	45 (1)	VH 0	H 0
8/15 to 10/15 2008	96 (2.2)	46-0-0	45 (1)	VH 0	H 0

Existing soil:water pH	Existing soil lab buffer pH	Target field pH	Agricultural limestone to apply** ton/A (lb/1000 ft ²)
6.18	6.34	6.2	.25 (12)

* Ideal application dates shown; see Section 5A below for further guidance.

** Assuming CCE = 100%

5. Nutrient Management Guidelines

A. Season of Application of Fertilizers and Cautions

All fertilizer will be applied between March 15th and November 1st. Fertilization of grasses outside of this window may result in lost nutrients. Cool season grasses should be fertilized between August 15th and October 15th to encourage good root development in the fall. If fall fertilization is not possible, spring fertilization between March 15 and May 15 is an acceptable alternative. Maximum annual N application may not exceed 90 lbs/Ac. Warm season grasses should be fertilized between June 1 and August 1. This will result in denser stands of grass the following year.

B. Impervious Surfaces

Do not apply fertilizers containing nitrogen or phosphorus to impervious surfaces (sidewalks, streets, etc.). DO NOT use urea as an ice melting substance in cold weather. 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 and/or use a leaf blower etc., to return the fertilizer back to the turfgrass canopy.

C. Management Guidelines to Improve Density of Turf without Use of Fertilizers

1. Returning Grass Clippings – Do not pick up clippings when mowing. This will allow the nutrients to recycle back to the soil.

2. Legumes, such as white clover, may be incorporated into the turf to provide long term N source for grasses. The pH of the soil should not be lower than 6.0 - 6.5, and the level of phosphorus should be at soil test level no higher than “M”.

3. Suggested Mowing Guidelines – cool and warm season grasses should **not** be mowed lower than 2-3 inches. Mowing height in the summer should be 3.5 to 4.5 inches. Mowing the grasses below their minimum height (scalping) should never be allowed, because this can kill the vegetation. The mowing should be timed so that no more than 1/3 of the leaf blade length is removed per cutting. This allows the plant to continue normal growth, while removing more will shock the plant and retard recovery.

4. Mower blades need to be kept sharp. This produces a cleaner cut which reduces the amount of brown leaf ends, stress and disease on the grass plants. The results are a healthier and stronger turfgrass that may need less pest control.

D. Environmentally Sensitive Areas

Fertilizer should not be spread within 50 feet of any permanent body of water or other environmentally sensitive areas. The use of fertilizers with slow release nitrogen is greatly encouraged, especially where there is any reason to suspect environmental concerns.

E. Use of Iron

Foliar iron supplements may be used to stimulate a greening effect on the turfgrass during the summer months without additional applications of nitrogen. A rate of 1 to 1.5 pounds of iron per acre is appropriate.

F. Spreader Calibration

All fertilizer spreaders will be calibrated per the guidance given below.

Calibration of Spreaders¹

Pan Method

Push the spreader over a pan(s) and collect and weigh the material that was spread. By knowing the area of the pan and weight of the material, the application rate can be determined by:

$$\text{Material per } \frac{\text{Grams}}{1,000 \text{ sq. ft}} = 1,000 \times \frac{\text{Grams Material Collected}}{\text{ft}^2 \text{ Pan} \times \# \text{ of Pans} \times \# \text{ of Passes}}$$

Sweep and Weigh Method for Drop Spreader

Push a drop spreader over a clean, smooth surface of a known distance and sweep and weigh the material. The application rate can be determined by:

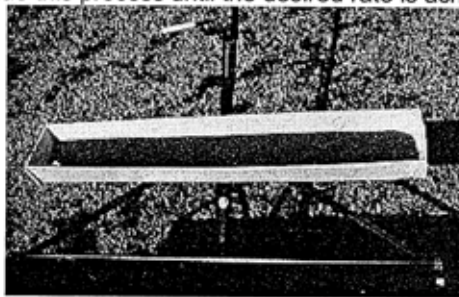
$$\text{Material per } \frac{\text{Grams}}{1,000 \text{ sq. ft}} = 1,000 \times \frac{\text{Grams Material Collected}}{\text{Spreader Width} \times \text{Distance Traveled}}$$

Catch Pan Method

Attach a catch pan to the bottom of the spreader. Establish and mark two points of a known distance. Push the spreader over the known distance, opening the hopper at the starting point, and closing at the finish point, while collecting the material in the catch pan. The application rate is determined by using the following formula:

$$\text{Material per } \frac{\text{Grams}}{1,000 \text{ sq. ft}} = 1,000 \times \frac{\text{Grams Material Collected}}{\text{Spreader Width} \times \text{Distance Traveled}}$$

Whichever method is used, make enough passes or travel enough distance so that the material collected is enough to be weighed accurately. If the calculated rate is too high, reduce the setting adjustment. If it is too low, increase the setting adjustment. Continue this process until the desired rate is achieved.



6. Record of Actual Nutrient Applications July 1, 2006 to July 1, 2007

VDOT Lynchburg District Office Complex Turf 4219 Campbell Ave Lynchburg, VA 24501			Size: 5.45 A Date Worksheet Prepared: 6/1/06		
Year, Month	Fertilizer Ratio Applied	Amount Fertilizer Applied lb/A (lb/1000 ft ²)	Nitrogen Applied lb/A (lb/1000 ft ²)	P ₂ O ₅ Applied lb/A (lb/1000 ft ²)	K ₂ O Applied lb/A (lb/1000 ft ²)
Year, Month	Agricultural limestone applied				
	ton/A (lb/1000 ft ²)				

Note: This 'Record of Actual Nutrient Applications' sheet must be submitted with the subsequent plan regardless of amount and timing of fertilizer or lime application with this plan's period.

II. List of VDOT Residencies in Lynchburg District and NMP Requirements

<p>Amherst Residency 515 Amherst Highway Amherst, VA 24521 (434) 947-2159</p> <p>Appomattox Residency 1008 Ferguson ST Appomattox, VA 24522 (434) 947-2167</p> <p>Chatham Residency 19281 U.S. Highway 29 Chatham, VA 24531 (434) 432-7214</p>	<p>Dillwyn Residency 3400 Rosney Road Dillwyn, VA 23936 (434) 947-2315</p> <p>Farmville Shop Area HQ 1202 Andrews Dr Farmville, VA 23901 434-392-4700</p> <p>Halifax Residency 5211 Halifax Road U.S. Highway 501 Halifax, VA 24558 (434) 476-6342</p>
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Application of nutrients to all other VDOT permanent facilities such as residencies, shops, and park-and-rides **will require a site-specific nutrient management plan** as shown in section I of this chapter. This will require that a soil test and application area map be prepared for each facility. Contact W. Lee Daniels (wdaniels@vt.edu; 540-231-7175) for assistance in preparation of site-specific nutrient management plans.