

12 VAC 5-585-70 Enforcement

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- A. All biosolids use facilities shall be constructed and operated in compliance with the requirements as set forth in this chapter.
- B. Notice. Whenever the commissioner has reason to believe that a violation of Title 32.1 of the Code of Virginia or of any provisions of this chapter has occurred or is occurring, the division shall so notify the alleged violator. Such notice shall be: (i) in writing, with a request to the owner to respond by providing any pertinent information on this issue they may wish; (ii) cite the statute, regulation or regulations that are allegedly being violated; and (iii) state the facts which form the basis for believing that the violation has occurred or is occurring. Such notification is not an official finding or case decision nor an adjudication, but may be accompanied by a request that certain corrective action be taken.
- C. Orders. Pursuant to Section 32.1-26 of the Code of Virginia, the commissioner may issue orders to require any owner to comply with the provisions of Title 32.1 of the Code of Virginia or the provisions of this chapter. The order may require:
1. The immediate cessation or correction of the violation;
 2. The acquisition or use of additional equipment, supplies or personnel to ensure that the violation does not recur;
 3. The submission of a plan to prevent future violations;
 4. The submission of an application for a variance;
 5. Any other corrective action deemed necessary for proper compliance with this chapter; or
 6. Evaluation and approval, if appropriate, of the required submissions.

D. Compliance. The commissioner may act as the agent of the board to enforce all effective orders and this chapter. Should any owner fail to comply with any effective order or this chapter, the commissioner may:

1. Institute a proceeding to revoke the owner's permit in accordance with 12 VAC 5-585-220;
2. Request the attorney for the Commonwealth to bring a criminal action;
3. Request the Attorney General to bring an action for civil penalty, injunction, or other appropriate remedy; or
4. Do any combination of the above.

E. Disputes involving local ordinances.

1. In the event of a dispute between a locality that has adopted a local ordinance for testing and monitoring the land application of sewage sludge and a permittee concerning the existence of a violation, the activity alleged to be in violation shall be halted pending a determination by the commissioner. The decision of the commissioner shall be final and binding unless reversed on judicial appeal pursuant to Section 2.2-4026 of the Code of Virginia. If the activity is not halted, the commissioner may seek an injunction compelling the halting of the activity, from a court having jurisdiction.
2. Upon determination by the division that there has been a violation of Sections 32.1-164.5, 32.1-164.6, or 62.1-44.19:3, of the Code of Virginia, or of any regulation promulgated under those sections, and that such violation poses an imminent threat to public health, safety or welfare, the commissioner shall commence appropriate action to abate the violation and immediately notify the chief administrative officer of any locality potentially affected by the violation.

~~E. F.]~~ Nothing in this section shall prevent the commissioner or the division from taking actions to obtain compliance with permit requirements prior to issuing an order, or from making efforts to obtain voluntary compliance through conference, warning, or other appropriate means.

12 VAC 5-585-510. Biosolids utilization methods.

A. Agricultural use. Agricultural use of sewage sludge is the land application of biosolids (Table 8) to cropland or pasture land to obtain agronomic benefits as a plant nutrient source and soil conditioner. This use shall require a system design which ensures that the land application procedures are performed in accordance with sound agronomic principles.

1. Sludge treatment. As a minimum, biosolids that are applied to the land or incorporated into the soil shall be treated by a Class II pathogen treatment process and shall be treated or managed to provide an acceptable level of vector attraction reduction.

2. Site soils. Soils best suited for agricultural use should possess good tilth and drainage capabilities, have moderate to high surface infiltration rates and moderate to slow subsoil permeability. Depth to bedrock or restrictive layers should be a minimum of 18 inches. Depth to the seasonal water table should exceed 18 inches as defined by the Soil Conservation Service soil survey. If such information is not available the water table depth may be determined by soil characteristics or water table observations. If the soil survey or such evidence indicates that the seasonal water table can be less than 18 inches below the average ground surface, soil borings shall be utilized within seven days prior to land application operations during periods of high water table for the soil series present, to verify that the 18-inch depth restriction is complied with during field operations. The use of soil borings and water table depth verification may be required for such sites from November to May (during seasonal high water table elevations) of each year depending on soil type. Constructed channels (agricultural drainage ditch) may be utilized to remove surface water and lower the water table as necessary for crop productions and site management.

The pH of the biosolids and soil mixture shall be 6.0 or greater at the time of each biosolids application if the biosolids cadmium concentration is greater than or equal to 21 mg/kg. The soil pH must be properly tested and recorded prior to land application operations during which a pH change of ½ unit or more may

occur within the zone of incorporation (i.e., use of biosolids containing lime or other alkaline additives at 10% or more of dry solid weight).

3. Management practices.

a. Application rates and requirements. Process design considerations shall include sludge composition, soil characteristics, climate, vegetation, cropping practices, and other pertinent factors in determining application rates. Site specific application rates should be proposed using pertinent biosolids plant available nitrogen (PAN) and crop nutrient needs (agronomic rate listed in Table 11) and the cumulative trace element loading rates (Table 9). Lime amended biosolids shall be applied at rates which are not expected to result in a target soil pH in the plow layer above a pH of 6.5 for soils located in the coastal plain and above a pH of 6.8 in other areas of the state [(Table 14)]. Agricultural use of treated septage shall be in accordance with these requirements (Table 13). The biosolids application rate shall be restricted to the following criteria in accordance with the approved [~~operation~~ management practices] plan [(12 VAC 5-585-630)]:

(1) For infrequent applications, biosolids may be applied such that the total crop needs for nitrogen (Table 11 Agronomic Rate) is not exceeded (in order to minimize the amount of nitrogen that passes below the crop root zone to actually or potentially pollute groundwater), during a one year crop rotation period including the production and harvesting of two crops in succession within a consecutive 12-month growing season. However, the total application of biosolids shall not exceed a computed maximum loading of 15 dry tons per acre, unless a higher loading can be justified in relation to both the biosolids and the site characteristics, including the biosolids nutrient and dry solids content and the site slopes. No further applications of biosolids shall be allowed for a period of three years from the date that the agronomic rate is achieved for the crop or crops grown in the following 12 months.

(2) The infrequent application rate may be restricted: (i) down to 10% of the maximum cumulative loading rate (Table 9) for cadmium and lead (i.e., 2.0 kilograms per hectare (kg/ha) for cadmium); (ii) to account for all sources of nutrients applied to the site, including existing residuals.

(3) The infrequent application rate may also be restricted by the [~~maximum established CCE loading rate (Table 14)~~ lime content of the biosolids].

(4) For systems designed for frequent application of biosolids (application of the PAN requirement for a normal crop rotation more frequently than once in every three years), the previous year's applied Biosolids nitrogen and mineralization rates (Table 12) and soil phosphorus levels, shall be considered in the design and proposed subsequent application rates. Acceptable nutrient management requirements shall be included in the [~~operation management practices~~] plan for all sites proposed for frequent at-agronomic application rates [(12 VAC 5-585-630)].

(5) Frequent below-agronomic application rate involves frequent applications of biosolids on permanent pasture or hay at less than the PAN requirement listed in Table 11. Frequent below-agronomic application rates shall be calculated using one of the following options:

(a) A maximum of 70% of the nitrogen requirement of the permanent pasture or hay crop can be applied on an annual basis. The 70% application rate shall be calculated after accounting for the previous two years' applied biosolids nitrogen mineralization rates.

(b) A maximum of 50% of the nitrogen requirement of the permanent pasture or hay crop can be applied on an annual basis. It is not necessary to account for the previous two years' applied biosolids nitrogen mineralization rates under this option.

For systems designed for frequent below-agronomic rates, surface and groundwater monitoring [~~and a certified nutrient management plan~~] shall not be required. Soil phosphorus levels shall be considered in the design of proposed subsequent application rates. On warm-season grasses and alfalfa, no application shall be made between September 15 and March 15.

b. Standard slopes and topography. Management practices specifying uniform application of biosolids at approved rates should be established in accordance with standard slopes. Agronomic practices and crop growth on sites with slope of not greater than 5.0% will provide acceptable protection of surface water quality during the active growing season. If biosolids are applied to site slopes greater than 5.0% during the period of November 16 of one year to March 15 of the following year certain Best Management Practices (BMP's) should be utilized (see subdivision 3 c (1) of this subsection). Biosolids should be directly-injected into soils on sites exhibiting erosion potential unless other best management practices are utilized to minimize soil erosion and the potential of nonpoint runoff. Biosolids shall not be applied to site slopes exceeding 15%. Biosolids shall be direct-injected or incorporated (mixed within the normal plow layer within 48 hours) if: (i) applied on sites with less than 60% uniform residue cover (stalks, vines, stubble, etc.) within any portion of the site; or (ii) applied to soils during periods of time soils may be subject to frequent flooding as defined by soil survey information.

c. Operations.

(1) Field management. The application rate of all application equipment shall be routinely measured as described in an approved sludge management plan and every effort shall be made to ensure uniform application of biosolids within sites in accordance with approved maximum design loading rates. Liquid sludges shall not be applied at rates exceeding 14,000 gallons per acre, per application. Sufficient drying times shall be allowed between subsequent applications. Application vehicles should be suitable for use on agricultural land. Pasture and hay fields should be grazed or clipped to a height of approximately four and six inches, respectively, prior to biosolids application unless the biosolids can be uniformly applied so as not

to mat down the vegetative cover so that the site vegetation can be clipped to a height of approximately four inches within one week of the biosolids application. If application methods do not result in a uniform distribution of biosolids, additional operational methods shall be employed following application such as dragging with a pasture harrow, followed by clipping if required, to achieve a uniform distribution of the applied biosolids.

[Surface incorporation may be required on cropland by the department, or the local monitor with approval of the department, to mitigate excessive odors, when incorporation is practicable and compatible with a soil conservation plan meeting the standards and specifications of the U.S. Department of Agriculture Natural Resources Conservation Service.

In accordance with the management practices plan, ~~When~~ when] biosolids are applied to site slopes greater than 7.0% between the period of November 16 of one year, and March 15 of the following year, one of the following practices shall be used to prevent runoff and soil loss:

(a) Biosolids are surface applied or subsurface injected beneath an established living crop such as hay, pasture, or timely planted small grain or cover crop;

(b) Biosolids are surface applied or subsurface injected so that immediately after application the crop residue still provides at least 60% soil surface coverage; or

(c) Biosolids are applied by surface application or subsurface injection and the site is operated in compliance with an existing soil conservation plan approved by the U.S.D.A. Natural Resource Conservation Service and will remain in compliance after any subsequent tillage operation to incorporate the biosolids.

[In accordance with the management practices plan,If if] site slopes exceed 5.0% up to 7.0%, biosolids can be applied by surface application or subsurface injection followed by: (i) incorporation within 48 hours of application if crop residue still provides at least 30% soil surface coverage immediately following incorporation, or (ii) ridge tilling or chisel plowing within 48 hours of application; during the period of November 16 to March 15 of the following year. The site should be chisel plowed or ridge tilled predominately along the contour so that uniform parallel ridges of four inches or greater are created that will improve soil roughness and reduce runoff. Consideration should also be given to the use of similar practices on slopes of 5.0% or less when feasible for applications during the late fall and winter.

[(2) Restrictions.] Biosolids application shall not be made during times when the seasonal high water table of the soil is within 18 inches of the ground surface. Biosolids may only be applied to snow covered ground if the snow cover does not exceed one inch and the snow and biosolids are immediately incorporated within 24 hours of application. Liquid sludges may not be applied to frozen ground. Dry or dewatered sludges may be applied to frozen ground only if: (i) site slopes are 5.0% or less; (ii) a 200-foot vegetative (i.e., at least 60% uniformly covered by stalks or other vegetation) buffer is maintained from surface water courses; and (iii) the entire application site has uniform soil coverage of at least 60% with stalks, vines, stubble, or other vegetation and the site soils are characterized as well drained.

[In accordance with the management practices plan,When when] biosolids are land applied between March 15 and September 1, crop planting following biosolids application should occur within a 30-day period. When biosolids are applied to sites between September 1 and November 16, an agronomically justified crop capable of trapping plant available nitrogen such as small grain shall be planted within 45 days of the application of biosolids or prior to November 16, whichever comes first, or an established cool season grass sod or timely planted small grain crop shall be present. The crop planted should be capable of germination and significant growth before the onset of winter so the plant is able to use available nitrogen released by the biosolids.

On sites with a high leaching index (greater than 10) as defined by the Department of Conservation and Recreation, an established cool season grass or timely planted small grain crop should be present when biosolids are applied to such sites between November 16 and December 21.

[d. Buffer zones.

(2) Standard buffer zones. (1) Setback distances. If slopes are greater than 7.0% and biosolids will be applied between November 16 and March 15, [standard buffer setback] distances to perennial streams and other surface water bodies shall be doubled. The location of land application of biosolids shall not occur within the following minimum buffer zone requirements:

Minimum Distances (Feet) to Land Application Area

| Adjacent Features | Surface Application(1) | Incorporation | Winter(2) |
|--|------------------------|---------------|-----------|
| Occupied dwellings | 200 ft. | 200 | 200 |
| Water supply wells or springs | 100 ft. | 100 | 100 |
| Property lines | 100 ft. | 50 | 100 |
| Perennial streams and other surface waters except intermittent streams | 50 ft. | 35 | 100 |
| Intermittent streams/drainage ditches | 25 ft. | 25 | 50 |
| All improved roadways | 10 ft. | 5 | 10 |
| Rock outcrops and sinkholes | 25 ft. | 25 | 25 |
| Agricultural drainage ditches with slopes equal to or less than 2.0% | 10 ft. | 5 | 10 |

FN(1) Note: Not plowed or disced to incorporate within 48 hours.

FN(2) Application occurs on average site slope greater than 7.0% during the time between November 16 of one year and March 15 of the following year.

The stated buffer zones to adjacent property boundaries and drainage ditches constructed for agricultural operations may be reduced by 50% for subsurface application (includes same day incorporation) unless state or federal regulations provide more stringent requirements. Written consent of affected landowners is required to reduce buffer distances from property lines and dwellings. In cases where more than one buffer distance is involved, the most restrictive distance governs. Buffer requirements may be increased or decreased based on either site specific features, such as agricultural drainage features and site slopes, or on biosolids application procedures demonstrating precise placement methods.

[(2) Extended buffer setback distances. For applications where surface applied biosolids are not incorporated the department may include as a site-specific permit condition authorization for the department, or the local monitor with approval of the department, to require extended buffer zone setback distances when necessary to protect odor sensitive receptors. When necessary, buffer zone setback distances from odor sensitive receptors may be extended to 400 feet or more and no biosolids shall be applied within such extended buffer zones. In accordance with 12 VAC 5-585-260, the commissioner may impose standards and requirements that are more stringent when required to protect public health and the environment, or prevent nuisance conditions from developing, either prior to or during biosolids use operations.]

e. Monitoring and testing.

[(3) Monitoring.]Groundwater and surface water and soils monitoring [and testing]may be required [by the department, or the local monitor with approval of the department]for any frequent application sites (reach agronomic rate more than once in three years) for which a potential environmental or public health concern

is identified by the commissioner in accordance with this chapter [(12 VAC 5-585-320)]. Groundwater monitoring [and testing] should not be required for infrequent application of biosolids.

B. Forestland (Silviculture). Silvicultural use includes application of biosolids to commercial timber and fiber production land, as well as federal and state forests. The forestland may be recently cleared and planted, young plantations (two-year-old to five-year-old trees) or established forest stands.

1. Sludge standards. Refer to Article 3 (12VAC5-585-540 et seq.) of this part.

2. Site suitability. Site suitability requirements should conform to subdivision A 2 of this section. The soil pH should be managed at the natural soil pH for the types of trees proposed for growth.

3. Management practices.

a. Application rates. Biosolids application rates shall be determined by the division in accordance with the provisions of subdivision A 3 of this section and based on nitrogen uptake rates and yields as recommended in information provided by the Virginia Department of Forestry.

b. Operations.

(1) Field management.

(a) High pressure spray shall not be utilized if public activity is occurring within 1,500 feet downwind of the application site. Public access to the site shall be adequately limited or controlled following application (Article 3 of this part).

(b) The operations should only proceed when the wind velocity is less than or equal to 15 miles per hour.

When high pressure spray is used windless conditions are preferred for such operations.

(c) Biosolids application vehicles should have adequate clearance to be suitable for silvicultural field use.

(d) Application scheduling should take into account high rainfall periods and periods of freezing conditions.

(e) Monitoring requirements shall be site specific and may include groundwater, surface water or soils, for frequent application

sites.

(2) Buffer zones. Buffer zones should conform to those for agricultural utilization. Refer to Table 2.

C. Reclamation of Disturbed Land. Biosolids applied at rates exceeding the agronomic rate may reclaim disturbed land in one or more of the following ways: (i) surface or underground mining operations, (ii) the deposition of ore processing wastes, (iii) deposition of dredge spoils or fly ash in construction areas such as roads and borrow pits. Reclamation of disturbed land is within the jurisdiction of the Virginia Department of Mines, Minerals and Energy. That department should be contacted concerning issuance of a permit for these operations. The land reclamation operation plan should be prepared with the assistance of the Virginia Department of Conservation and Recreation, the Soil Conservation Service and the Virginia Cooperative Extension Service.

1. Sludge standards. Refer to Article 3 of this part.

2. Site suitability. Site suitability requirements should conform to subdivision A 2 of this section. Exceptions may be considered on a case-by-case basis.

3. Management practices.

a. Application rates. The application rates shall be established by the division in accordance with subdivision A 3 of this section and the recommendation of appropriate agencies including the Virginia Department of Mines, Minerals and Energy and the appropriate faculty of the Department of Crop and Soil Environmental Sciences of the Virginia Polytechnic Institute and State University.

b. Vegetation selection. The land should be seeded with grass and legumes even when reforested in order to help prevent erosion and utilize available plant nitrogen. The sludge management plan should include information on the seeding mixture and a detailed seeding schedule.

c. Operations.

(1) The soil pH should be maintained at 6.0 or above if the cadmium level in the biosolids applied is at or above 21 mg/kg during the first year after the initial application. Soil samples should be analyzed by a qualified laboratory. The application rate shall be limited by the most restrictive cumulative trace element loading (Table 9).

(2) Surface material should be turned or worked prior to the surface application of liquid biosolids, to minimize potential for runoff, since solids in liquid sludge can clog soil surface pores.

(3) Unless the applied biosolids are determined to be Class A or have been documented as subjected to Class I treatment, crops intended for direct human consumption shall not be grown for a period of three years following the date of the last sludge application, unless the crop is tested to verify that the crop is not contaminated. No animals whose products are intended for human consumption may graze the site or obtain

feed from the site for a period of six months following the date of the last biosolids application, unless representative samples of the animal products are tested after grazing and prior to marketing to verify that they are not contaminated.

12-VAC-585-600. Maximum Application Rates for High Lime Biosolids.

Application rates for ~~[biosolids borne calcium carbonate equivalency (CCE) alkaline stabilized biosolids]~~ may be restricted in accordance with the soil pH ~~[as listed in Table 14 buffer capacity]~~, as ~~determined by commercial and state soil testing laboratories.~~ ~~[Biosolids The application of biosolids-]~~ conditioned or stabilized with lime ~~[contain quantities of lime that may affect soil pH (expressed as calcium carbonate equivalency)] will increase soil pH].~~ Unless properly controlled, high rates of ~~[CCE calcium carbonate equivalence (i.e., CCE, which is a factor that relates the liming potential of biosolids to calcium carbonate limestone)]~~ application can have an adverse effect on crop productivity by increasing the soil pH beyond the range optimum for maximum crop production. ~~[Therefore, agricultural Agricultural]~~ use of biosolids with high CCE content should be controlled to correspond with current agricultural liming practices. ~~[Recommendations for application of agricultural limestone to soil types to obtain a desired pH value is given in Table 14. Corresponding application rates for lime stabilized biosolids may be computed by determining the actual CCE content of the biosolids and adjusting the recommended lime rate by the appropriate factor. For example, the rates in Table 14 should be multiplied by a factor of 3.33 to determine the biosolids application rate needed (dry tons/acre) for biosolids with a CCE of 30%.]~~ Calcium carbonate equivalent loading should not exceed rates designed to ~~[target attain]~~ soil pH values ~~[in the plow layer above of] 6.5 for [soils located in the low] coastal plain [soils and above] 6.8 for [mid to upper coastal plains soils located in other areas of the state].~~ Corresponding application rates for lime stabilized biosolids may be computed by determining the actual CCE content of the biosolids and adjusting the recommended lime rate by the appropriate factor. ~~[For example, the rates in Table 14 should be multiplied by a factor of 3.33 to determine the biosolids application rate needed (dry tons/acre) for biosolids with a CCE of 30%].~~

12-VAC-585-620. Minimum Information Required for ~~[Completion of]~~ a ~~[Biosolids]~~ Management ~~[Practices]~~ Plan Utilizing Land Application

A. General Information.

1. Legal Name and Address: The legal name of the owner making application for a permit is to appear on the title page or in the opening paragraph or both. Both the mailing and physical address should be included.

2. Owner Contact: The name, title, address, and telephone number of the individual to be contacted regarding this application should be furnished.

3. A general description of the proposed plan including: name and location of generators and owners involved and copies of agreements developed, biosolids quality, biosolids treatment and handling processes, means of biosolids transport or conveyance, location and volume of storage proposed, general location of sites proposed for application and methods of biosolids application proposed. A description of temporary storage methods should be provided.

4. Written permission of landowners and farmers on a form approved by the department and the board (see Table A-1) and pertinent lease agreements as may be necessary for operation of the treatment works.

5. [\[Methods for notification of Local Government and obtaining Compliance compliance\]](#) with local government zoning and applicable ordinances.

[\[6. A copy of a letter of approval of the nutrient management plan for the operation from the Department of Conservation and Recreation if required in 12-VAC-585-630A.3.\]](#)

~~B. Design information.~~

~~1. Biosolids Characterization.~~

~~a. Amounts and volumes to be handled.~~

~~b. Biosolids laboratory analytical data of a representative number of samples of biosolids in accordance with the guideline specified in accordance with Tables 2 and 3. Statement that the biosolids is nonhazardous, documentation statement for treatment and quality and description of how treated biosolids meets other standards in accordance with this chapter.~~

~~2. If a facility construction permit must be issued the appropriate certificate shall be obtained from the State Water Control Board and a Permit To Operate obtained in accordance with 12VAC5-585-200 or 12VAC5-585-240, with plans and specifications for storage facilities of all biosolids to be handled, including routine and emergency storage, depicting the following information:~~

~~a. Site layout on a recent 7.5 minute topographic quadrangle or other appropriate scaled map with the following information:~~

~~(1) Location of any required soil, geologic and hydrologic test holes or borings will be submitted.~~

~~(2) Location of the following field features within 0.25 miles of the site boundary (indicate on map) with the approximate distances from the site boundary.~~

~~(a) Water wells (operating or abandoned).~~

~~(b) Surface waters.~~

~~(c) Springs.~~

~~(d) Public water supplies.~~

~~(e) Sinkholes.~~

- ~~(f) Underground and/or surface mines.~~
- ~~(g) Mine pool (or other) surface water discharge points.~~
- ~~(h) Mining spoil piles and mine dumps.~~
- ~~(i) Quarries.~~
- ~~(j) Sand and gravel pits.~~
- ~~(k) Gas and oil wells.~~
- ~~(l) Diversion ditches.~~
- ~~(m) Occupied dwellings, including industrial and commercial establishments.~~
- ~~(n) Landfills—dumps.~~
- ~~(o) Other unlined impoundments.~~
- ~~(p) Septic tanks and drainfields.~~
- ~~(q) Injection wells.~~

~~b. Topographic map (10-foot contour preferred) of sufficient detail to clearly show the following information:~~

- ~~(1) Maximum and minimum percent slopes.~~
- ~~(2) Depressions on the site that may collect water.~~
- ~~(3) Drainageways that may attribute to rainfall run-on to or runoff from this site.~~
- ~~(4) Portions of the site (if any) which are located within the 100-year floodplain.~~

~~e. Data and specifications for the liner proposed for seepage control.~~

d. Scaled plan view and cross-sectional view of the facilities showing inside and outside slopes of all embankments and details of all appurtenances.

e. Calculations justifying impoundment capacity.

f. Groundwater monitoring plans for the facilities including pertinent geohydrological data to justify upgradient and downgradient well location and depth.

3. Generic plans for on-site temporary storage.

4. A legible topographic map of proposed application areas to scale as needed to depict the following features:

(a) Property boundaries.

(b) Surface water courses.

(c) Water supply wells and springs.

(d) Roadways.

(e) Rock outcrops.

(f) Slopes.

(g) Frequently flooded areas (SCS designation).

The map shall also show the acreage to be amended with biosolids together with the net acres for biosolids application computed.

5. County map or other map of sufficient detail to show general location of the site and proposed transport vehicle haul routes to be utilized from the treatment plant.

~~6. A USDA soil survey map, if available, of proposed sites for land application of biosolids.~~

~~7. Representative soil samples are to be collected to address each major soil types for each field and analyzed for the soil parameters indicated in accordance with Table 5, and test results should be submitted with the operational plan.~~

~~8. For projects utilizing frequent application of biosolids the following additional site information will be necessary.~~

~~a. Information specified (2 a and 4);~~

~~b. Representative soil borings and test pits to a depth of five feet or to bedrock if shallower, are to be coordinated for each major soil type and the following tests performed and data collected.~~

~~(1) Soil type.~~

~~(2) Soil texture for each horizon (USDA classification).~~

~~(3) Soil color for each horizon.~~

~~(4) Depth from surface to mottling and bedrock if less than two feet.~~

~~(5) Depth from surface to subsoil restrictive layer.~~

~~(6) Indicated infiltration rate (surface soil).~~

~~(7) Indicated permeability of subsoil restrictive layer.~~

~~c. Additional soil testing in accordance with Table 5.~~

~~d. Groundwater monitoring plans for the land treatment area including pertinent geohydrologic data to justify upgradient and downgradient well location and depth.~~

~~9. Description of agricultural practices including a list of proposed crops to be grown, their respective anticipated yield, planting and harvesting schedules, proposed biosolids application rates on a field by field basis and how biosolids application will be integrated with these schedules.~~

~~10. Pertinent calculations justifying storage and land area requirements for biosolids application including an annual biosolids balance incorporating such factors as precipitation, evapotranspiration, soil percolation rates, wastewater loading, monthly storage (input and drawdown).~~

12-VAC-585-630. ~~[Operation Plan~~ Minimum Specific Information Required for a Management Practices Plan] (To be made available for field use and farmer/owner information).

~~[A. Comprehensive, general description of the operation including biosolids source(s), quantities, flow diagram illustrating treatment works biosolids flows and solids handling units, site description, crops utilized, application rates, methodology of biosolids handling for application periods, including storage~~

~~and nonapplication period storage, and alternative management methods when storage is not provided. Information in accordance with a nutrient management plan as approved by the Department of Conservation and Recreation shall be submitted for all frequent at agronomic application sites. The nutrient management plan information shall also be submitted for proposed application sites owned or operated in conjunction with operations in which: (i) domestic livestock have been, are, or will be stabilized or confined and fed or maintained for a total of 45 days or more in any 12-month period; and (ii) crops, vegetation, forage growth or post harvest residues are not sustained over any portion of the operation site. The approved nutrient management plan shall account for all sources of nutrients to be applied to the site and include at a minimum the following information: (i) a site map indicating the location of any waste storage facilities and the fields where biosolids will be applied; (ii) site evaluation and assessment of soil types and potential productivities; (iii) nutrient management sampling including soil monitoring; (iv) biosolids application rates based on the overall nutrient requirements of the proposed crop and soil monitoring results; and (v) biosolids and other nutrient source application schedules and land area requirements.~~

A. Site Management Plans.

1. Comprehensive, general description of the operation including biosolids source(s), quantities, flow diagram illustrating treatment works biosolids flows and solids handling units, site description, methodology of biosolids handling for application periods, including storage and nonapplication period storage, and alternative management methods when storage is not provided.
2. A nutrient management plan prepared by a person that is certified as a nutrient management planner by the Commonwealth of Virginia shall be developed for all application sites, prior to biosolids application. Copies of the nutrient management plan shall be provided to the farmer operator of the site, the

Department of Conservation and Recreation regional office and the Chief Executive Officer or designee for the local government, unless they request in writing not to receive the nutrient management plan.

3. A nutrient management plan approved by the Department of Conservation and Recreation shall be required for land application more frequently than once every three years at greater than 50 percent of the annual agronomic rate on application sites and application sites owned or operated in conjunction with a confined animal feeding operations. Confined animal feeding operation means: (i) domestic livestock have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period; and (ii) crops vegetation, forage growth or post-harvest residues are not sustained over any portion of the operation site.

4. All nutrient management plans shall account for all sources of nutrients to be applied to the site and include at a minimum the following information: (i) a site map indicating the location of any waste storage facilities and the fields where biosolids or animal waste will be applied; (ii) site evaluation and assessment of soil types and potential productivities; (iii) nutrient management sampling including soil monitoring; (iv) biosolids or animal waste application rates based on the overall nutrient requirements of the proposed crop and soil monitoring results; and (v) biosolids and other nutrient source application schedules and land area requirements.]

B. Biosolids transport.

1. Description and specifications on the bed or the tank vehicle.

2. Haul routes to be used from the biosolids generator to the storage unit and land application sites.

3. Procedures for biosolids off-loading at the biosolids facilities and the land application site together with spill prevention, cleanup, (including vehicle cleaning), field reclamation and emergency spill notification and cleanup measures.

4. Voucher system used for documentation and recordkeeping.

C. Field operations.

1. Storage.

a. Routine storage--supernatant handling and disposal, biosolids handling, and loading of transport vehicles, equipment cleaning, freeboard maintenance, inspections for structural integrity.

b. Emergency storage--procedures for department/board approval and implementation.

c. Temporary [or Field] storage--procedures to be followed including either designated site locations provided in the "Design Information" or the specific site criteria for such locations including the liner/cover requirements and the time limit assigned to such use.

d. Field reclamation of off-loading [(staging)] areas.

2. Application methodology.

a. Description and specifications on spreader vehicles.

b. Procedures for calibrating equipment for various biosolids contents to ensure uniform distribution and appropriate loading rates on a day-to-day basis.

c. Procedures used to ensure that operations address the following constraints: Application of biosolids to frozen ground, pasture/hay fields, crops for direct human consumption and saturated or ice/snow covered ground; maintenance buffer zones, slopes, prohibited access for beef and dairy animals, soil pH requirements, and proper site specific biosolids loading rates on a field-by-field basis.

TABLE 12

A. ESTIMATED NITROGEN MINERALIZATION RATES FOR BIOSOLIDS

| Biosolids Type | [Years After Application | | |
|------------------------|--------------------------|--------|-------|
| | First | Second | Third |
| Lime Stabilized | 0.30 | 0.15 | 0.07 |
| Aerobic digestion | 0.30 | 0.15 | 0.08 |
| Anaerobic digestion(1) | 0.20(2) | 0.10 | 0.05 |
| Composted(3) | 0.10 | 0.05 | 0.03 |

FN(1) Note: Typical anaerobically digested municipal biosolids should be characterized by a total volatile solids fraction of 55% or less total organic nitrogen of 4.0% or less and an ammonia nitrogen content of 1.0% or less.

FN(2) The mineralization rate may be increased up to a value of 0.3 in accordance with the degree of stabilization achieved.

FN(3) Biosolids compost should be characterized by a total organic nitrogen content of 2.0% or less and no significant ammonia nitrogen.

| Biosolids Type | Application Year | | | |
|------------------------|------------------|-------|-------|-------|
| | (0-1) | (1-2) | (2-3) | (3-4) |
| Lime Stabilized | 0.30 | 0.10 | 0.10 | 0.05 |
| Aerobic Digestion | 0.30 | 0.10 | 0.10 | 0.05 |
| Anaerobic Digestion | 0.30 | 0.10 | 0.10 | 0.05 |
| Composted ² | 0.10 | 0.05 | 0.03 | 0.00 |

¹ To determine nitrogen available from previous Biosolids applications, multiply the initial organic nitrogen analysis by the appropriate mineralization factor.

² Total organic nitrogen content of 2% or less and no significant ammonia nitrogen.]

B. ESTIMATED BIOSOLIDS AMMONIA NITROGEN AVAILABILITY FACTORS BASED ON EXPECTED VOLATILIZATION RATES FOR BIOSOLIDS

| Management Practice | [-Percent Ammonia Volatilized | |
|-------------------------------|--------------------------------|------------------------------|
| | Biosolids pH Less than 10 | Biosolids pH Greater than 10 |
| Injection below surface | 0 | 0 |
| Surface application with/ | | |
| Incorporation within 24 hours | 15 | 25 |
| Incorporation within 1-7 days | 30 | 50 |

| Method of Application | Biosolids pH < 10 | Biosolids pH > 10 |
|---|-------------------|-------------------|
| Injection | 1.00 | 1.00 |
| Incorporated within 24 hours | 0.85 | 0.75 |
| Incorporated within 1-7 days | 0.70 | 0.50 |
| Incorporated after 7 days or no incorporation | 0.50 | 0.25 |

¹To determine the plant-available Biosolids ammonium nitrogen in the soil, multiply the Biosolids ammonium nitrogen concentration or total weight applied by the appropriate availability coefficient.

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TABLE 14

A. RECOMMENDED LIME APPLICATION RATES NEEDED TO ADJUST INITIAL SOIL pH TO 6.5 FOR COASTAL PLAINS SOILS

| <u>Initial Soil pH</u> | <u>Soil Type*</u> | |
|------------------------|------------------------|----------------------|
| | <u>Coarse Textured</u> | <u>Fine Textured</u> |
| <u>Lime, Tons/AC</u> | | |
| 4.8 | 3.5 | 4.5 |
| 5.0 | 3.0 | 3.75 |
| 5.5 | 1.75 | 2.5 |
| 6.0 | 1.25 | 1.5 |
| 6.3 | 0.75 | 1.0 |

B. RECOMMENDED LIME APPLICATION RATES NEEDED TO ADJUST INITIAL SOIL pH TO 6.8 FOR SOILS LOCATED OUTSIDE THE COASTAL PLAIN

| <u>Initial Soil pH</u> | <u>Soil Type*</u> | |
|------------------------|------------------------|----------------------|
| | <u>Coarse Textured</u> | <u>Fine Textured</u> |
| <u>Lime, Tons/AC</u> | | |
| 4.8 | 4.25 | 5.75 |
| 5.0 | 4.0 | 5.25 |
| 5.5 | 3.0 | 4.0 |
| 6.0 | 2.0 | 2.75 |
| 6.5 | 1.25 | 1.5 |

FN* Note: Coarse textured soils include those surface soils designated by USDA-SCS soil classification as sandy loam or lighter in texture; fine textured soils include those classified as having textures heavier than sandy loam.-]