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MEMORANDUM

TO: Legislative Committee on Administrative Rules

FROM: Laura DiPietro, Director of Water Quality

DATE: September 4, 2018

SUBJECT: Additional Documentation-Required Agricultural Practice Regulations-Subsurface Tile Drainage

The Agency of Agriculture, Food & Markets (the Agency) is submitting this memorandum to provide more clarity around the following:

1. Revised annotated text of the proposed rule (enclosed)
2. The rule is not arbitrary
3. There were public hearing and comment opportunities as required by the Administrative Procedures Act
4. Revised economic impact information.

We have provided this information in a list format within each category as a supplement to the record already provided in the filing materials.

We have also provided a review of ways in which the 2016 amendment of the Required Agricultural Practices (RAPs) is already structured to address nutrient losses from agricultural subsurface tile drainage.

1. Full annotated text of the proposed rule. (enclosed)

2. Explanation of how the rule is not arbitrary:

The rule is not arbitrary because it is developed in accordance with State statute (6 V.S.A. §§ 4810, and 4810a(b)). The specific standards and management requirements in the rule were carefully considered and designed to meet the requirements of state and federal law, without exceeding the Agency of Agriculture, Food & Market's statutory authority. The specific standards in the rule are as narrow in scope and extent as possible, while still conforming to statutory requirements. The Agency considered the latest scientific research regarding nutrient losses from agricultural subsurface tile drainage while preparing the proposed rule. Significant public comment and public input was taken both as part of the pre-rulemaking as well as formal rulemaking process, the Agency was responsive to comments made by the public when supported by science; a responsiveness summary to comments is included in the LCAR filing packet. A multi-faceted set of stakeholder groups reviewed the latest, best available science, discussed challenges with understanding sources and rates of losses or net improvements to water quality from agricultural subsurface tile drainage and made recommendations about best ways to structure a rule addressing tile drainage; the recommendations of these groups informed the development of the proposed rule.



The [2018 Acts and Resolves No. 156](#), Sec. 2, which added 3 V.S.A. § 801(13). This new section defines ‘arbitrary’ when applied to an agency rule or action. Below is the outline for each of the 3 parts of this definition as it applies to this proposed Rule and justification as to how the rule is not arbitrary.

a. Factual basis for the decision made by the agency.

- i. The Agency utilized an updated literature review published by the Lake Champlain Basin Program and authored by Stone Environmental, the Tile Drain Advisory Group which is a diverse group of members to represent the various stakeholders pertaining to tile drainage, and the rule making public comment process to develop the factual basis for decisions.
- ii. There are 7 changes to the existing RAPs in this proposed draft and the justification for each is summarized here, as well as in the responsiveness summary.
 1. Definition of Subsurface Tile Drainage
 - a. The Agency used a combination of the terms commonly used in the literature, public input from the Tile Drain Advisory Group and further public comment in the rule making process to develop a definition.
 2. Requirements for stacking manure and other agricultural wastes at least 100’ away from a tile drain.
 - a. “High P losses in tile drainflow have been observed from fields that received long-term manure applications, particularly at excessive rates (LCBP, Page 6).” The Agency identified unimproved field stacking sites for manure or other agricultural wastes as areas where excessive nutrient concentrations in the soil are more at risk of developing and therefore should have a separation distance for water quality protection. To be consistent with other requirements in the RAPs, which require 100 foot separation distances from other conveyances to surface water, the Agency extended the 100 foot isolation distance from field stacking sites to tile drains.
 3. Unimproved barnyard or feedlot cannot be sited over tile
 - a. “High P losses in tile drainflow have been observed from fields that received long-term manure applications, particularly at excessive rates (LCBP, Page 6).” Similar to field stacking of manure or agricultural wastes, the Agency identified unimproved barnyard or feedlots as areas where excessive nutrient concentrations in the soil are more at risk of developing and therefore should have a separation distance for water quality protection. In order to be consistent with other requirements in the RAPs, which require 100 foot separation distances from other conveyances to surface water, the Agency extended the 100 foot isolation distance from unimproved barnyards or feedlots to tile drains.
 4. When agricultural soils are greater than 20 ppm phosphorus, nutrient applications must be less than phosphorus recommendations when pattern tile drainage is present in the field.
 - a. “Although research results are variable, it has been widely observed that elevated levels of soil test P or soil P saturation (e.g., from long-term over-application of manure and/or fertilizer) lead to greater concentrations of P in tile drainflow (LCBP, Page 6).” With the requirement already in the RAPs to have a phosphorus reduction strategy, the Agency chose to be explicit in a reduction strategy that addressed both points from the research (reduce soil test P and cease long term applications at excessive rates of nutrients), which effectively will reduce P applications so that it would draw on the soil phosphorus.
 5. Vegetative Treatment Areas (VTA’s) and tile drains must have an isolation distance of at least 200 feet.
 - a. In addition to the research on soil test P saturation and tile drainage losses of nutrients mentioned in the previous proposed changes above, the Agency also considered the fact that VTA’s are not temporary in nature, unlike stacking locations must be removed and land applied according to a nutrient management plan at least



every 3 years, and therefore the Agency made the determination that a more protective standard was necessary. To be consistent with the existing RAPs, the separation distance from a VTA to a tile drain is in alignment with a waste storage facility and isolation distances from surface water and public or private water supplies which is 200 feet.

6. Rodent Guards

- a. “Preferential flow through soil cracks or macropores connecting the soil surface with tile drains is probably the most important influence on P loads from tile drainflow. Preferential flow can lead to rapid transport of sediment and surface-applied materials to the tile system, bypassing the filtering and buffering capacity of the soil matrix. Where conditions promote significant preferential flow, mass losses of sediment, and of particulate and dissolved P, can be comparable to losses in surface runoff (LCBP, Page 5).” As rodents move up into tile drains, they are known to chew through the tile line and make a connection to the ground surface, thereby creating a large preferential pathway. Rodent guards prevent rodents from entering the tile line from the open end and are well accepted within the industry. By requiring these on all new and modified installations it will minimize the potential impact that rodents can have on creating preferential pathways.

7. No new surface inlets

- a. “Preferential flow through soil cracks or macropores connecting the soil surface with tile drains is probably the most important influence on P loads from tile drainflow. Preferential flow can lead to rapid transport of sediment and surface-applied materials to the tile system, bypassing the filtering and buffering capacity of the soil matrix. Where conditions promote significant preferential flow, mass losses of sediment, and of particulate and dissolved P, can be comparable to losses in surface runoff (LCBP, Page 5).” Existing surface inlets are currently regulated in the RAPs, requiring additional setback distances from tilled land and manure applications. This draft proposes to mitigate this potential pathway on new installations by eliminating any new surface inlets going forward. In discussing surface inlets with the tile drain installers, the consensus was that adequate field management can be used to eliminate the need for surface inlets.

b. The decision made by the agency is rationally connected to the factual basis asserted for the decision.

- i. The Agency took the charge very seriously to assess the literature on tile drainage and identified the most justified actions to address the research findings that were consistently impacting water quality. In the description of the factual basis for the rule development above, the Agency referenced the research finding and the justification to help explain the rationale behind the connection for each change in the proposed rule.

c. The decision made by the agency does make sense to a reasonable person.

- i. Prior to creating a draft of the Rule, the Agency met with 190 stakeholders to gather input on issues relating to both with water quality and management. The Agency continued working with a portion of these stakeholders under the formal workgroup known as the Tile Drain Advisory Group (TDAG), which is a diverse group of stakeholders interested in tile drainage. The TDAG thoroughly reviewed the literature review published by LCBP, which included discussions on all 7 proposed changes in this rule filing. In addition, the Agency held 3 hearings and took public comment on these proposed regulations.

3. Summary of the public hearings held and public comment period.

The Vermont Agency of Agriculture, Food & Markets fulfilled the requirements of 3 V.S.A. § 836 by holding public hearings and taking public comment on the proposed rule revision to the RAP amendment #18P008. Public comment



was taken on the rule revision both in the form of public testimony recorded and comments submitted via mail, email, and collected at the public hearings.

The Agency held a public comment period when it filed the proposed rule. This public comment period ran from February 28, 2018 through April 20, 2018. During this time frame, the Agency held three public hearings in St. Albans on March 30, 2018, Montpelier on April 2, 2018, and Middlebury on April 5, 2018 to gather additional feedback on the final proposed rule, in which 33 interested individuals attended. Overall, the Agency received over 50 written and emailed comments on the proposed rule amendment during the comment period, which were all included in the filing packet submitted to LCAR.

In the filing packet submitted to LCAR, the Agency recognizes that the sign-in pages for these three public hearings were mistakenly left out. This mistake has been remedied with the attachment of those missing sign-in pages to this cover letter. The record of all written and oral comments received during the public comment period were included in the LCAR filing packet accepted by the Secretary of State's office on August 21, 2018 date.

In preparing the proposed rule as filed with ICAR, the Agency engaged in "pre-rulemaking" activities which included meetings to meet with stakeholders and gather feedback pertaining to the content of the amendment involving 190 attendees that provided important insight prior to formally initiating the rule amendment process. During these nine meetings, development of a rule amendment to the RAPs to address subsurface tile drainage was discussed. The Agency gathered the latest information and research pertaining to subsurface tile drainage prior to engaging in the formal rule amendment process, which was required of the Agency pursuant to 6 V.S.A. §4810a(b). The information gathered and discussed during these meeting, attended by a variety of stakeholders, helped inform the Agency form the initial composition and content of the propose rule amendment.

Enclosed you will find the revised public comment and testimony received packet with the sign-in sheets from the public hearings.

4. Summary of additional review the Agency performed during the Economic Impact Statement

Additional significant economic impacts are not expected to result from this amendment, as additional management strategies a farmer will need to adopt as required in this rule amendment will be planned for in Nutrient Management Plans already prescribed, and required to be implemented by the farmer, within the 2016 amendment of this rule.

Specifically, the USDA-NRCS 590 Nutrient Management Standard (pg. 5) states that:

When there is a high risk of transport of nutrients, conservation practices must be coordinated to avoid, control, or trap manure and nutrients before they can leave the field by surface or subsurface drainage (e.g., tile).

The new requirements for stacking of manure or other agricultural wastes, unimproved barnyards or feedlots and vegetative treatment areas for agricultural wastes are all siting requirements, and thus can be addressed by choosing a location on the farm that meets those requirements rather than an investment in infrastructure, which is not expected to have a direct economic impact.

Furthermore, both requirements already fall under Nutrient Management Standards, which are *already prescribed* and required by the farmer. Specifically, both practices are considered as having high risk of transporting nutrients and thus actions should be taken to avoid nutrients leaving fields – hence the required setbacks from subsurface tile drainage. The Agency is providing clarification to existing standards regarding what a minimum setback would be to meet the requirements to avoid, control and trap manure or nutrient runoff to subsurface tile lines.



With regard to the land necessary to meet the requirement of a 200 ft setback for vegetative treatment areas (VTA):

Locating new VTA 200 ft upslope of subsurface tile would not necessitate the acquiring of new land due to the close proximity of VTA within or near the farmstead rather than the cropland. Farmers already attempt to minimize and avoid any amount of cropland that would be impacted from the installation of a new VTA. Installing a new VTA away from tile is common practice and similar to other setbacks for waste storage areas prescribed in the RAPs, such as field stacks or animal mortality composts. These planning and design requirements would be embedded with the set of setbacks and other planning requirements which are considered during the design and implementation of structures to meet NRCS conservation practice standards in the production area or other standards as prepared by a PE. These services are provided at no cost to the farmer through AAFM's engineering services, AAFM's A&E program or through NRCS CTA program. Locating new subsurface tile 200 ft downslope from VTA is a requirement going forward, which means existing land that is not tiled could still be used as it is today. Further, due to the typical location of VTA's within the production area, the impact of not being able to tile within 200 feet to cropland is expected to be minimal.

As part of the public input process for pre-rulemaking of the RAP tile drain amendment, significant input was solicited from tile drain installers and farmers as to the frequency of installation of surface inlets as part of a new agricultural subsurface tile drain system. Both parties reported that insulation of surface inlets is not a common practice as it is a threat to the long-term operation and maintenance of the tile drain system. Preparing the field so surface inlets are no longer required is now common practice. Making the decision to prepare the field to be level has a greater longer term benefit to overall crop production and economic opportunity, despite the fact that installing a surface inlet is the least cost alternative at the time for managing excess water. Additionally, the current RAPs amended in 2016 restrict off site movement of manure or other agricultural wastes, which a surface inlet increases that risk, thereby reducing the long term cost. Agricultural subsurface tile drains can be installed and function optimally without surface inlets, thereby minimizing the economic impact of restricting the installation of surface inlets.

Overall, according to the Economic Impact Analysis, "the remaining provisions [other than rodent guards] of the rule amendment for subsurface tile drainage include provisions already required by the 2016 amendment or are management considerations which do not cause a direct economic impact.

Enclosures:

Attachment A - Full Annotated Text of Proposed Rule

Attachment B – Revised public comment filing packet

Attachment C - How the 2016 RAPs Address Tile Drainage



ATTACHMENT A

This document, developed pursuant to Act 64 (2015 session), is the amended ANNOTATED TEXT of the Required Agricultural Practices (RAPs) that was submitted to the Secretary of State's Office and the Legislative Committee on Administrative Rules (LCAR) on August 21-September 4, 2018. For more information, please visit <http://agriculture.vermont.gov/rap-tile-rule> or contact the Vermont Agency of Agriculture, Food and Markets at (802) 828-2431.

REQUIRED AGRICULTURAL PRACTICES RULE FOR THE AGRICULTURAL NONPOINT SOURCE POLLUTION CONTROL PROGRAM

Section 1. General

- 1.1 Preamble: Agriculture has been identified as a major contributor of non-point source pollution to surface waters of Vermont. For example, the Lake Champlain Total Maximum Daily Load (TMDL), as modeled by the Environmental Protection Agency, estimates that nutrient losses from agricultural activities represent 29% of the total phosphorous load to the Lake Champlain basin and over 40% of Vermont's contribution to the phosphorous load to the basin. Agriculture contributes non-point source pollution to surface and groundwater from multiple sources, including cropland erosion, farmstead management, crop storage, and manure storage and application. While contributions of non-point source pollution from agriculture may vary from watershed to watershed, the overall impact to water quality from agricultural lands, when not managed well, is significant.

The Vermont legislature first directed the Agency of Agriculture, Food and Markets to develop a comprehensive Agricultural Non-Point Source Pollution Reduction Program in 1992. The Accepted Agricultural Practices Rules (AAPs), which regulate farming activities in order to protect water quality, became effective in 1995 and were revised in 2006.

As a result of Act 64—the Vermont Clean Water Act—the Agency of Agriculture was tasked with updating the AAPs to further reduce the impact of agricultural activities to water quality across the State. The Required Agricultural Practices Rules (RAPs) are an updated version of the AAPs, re-written to a higher level of performance.

Act 64, which was signed into law by the Governor in June 2015, amended and enacted multiple requirements related to water quality in the State. The act required the Agency of Agriculture to amend several provisions of the AAPs in order to improve water quality in Vermont. The first change was to rename the Accepted Agricultural Practices Rules the Required Agricultural Practices Rules. The RAPs are standards to which all types of farms must be managed. Act 64 further required the Agency of Agriculture to:

- Establish requirements for a Small Farm Certification Program;
- Establish nutrient, manure, and waste storage standards;
- Make recommendations for soil health;
- Establish requirements for vegetated buffer zones;
- Establish requirements for livestock exclusion from surface water;
- Establish nutrient management planning standards; and

- Establish standards for soil conservation such as cover cropping

The standards and rules that follow are intended to improve the quality of all of Vermont's waters by reducing and eliminating cropland erosion, sediment losses, and nutrient losses through improved farm management techniques, technical and compliance assistance, and, where appropriate, enforcement. This rule strives to balance the complexity, variability, and requirements of farm management with the need to improve that management in order to meet the State's goals in improving and protecting water quality.

Soil quality and soil health are critical elements of an overall agricultural non-point source pollution reduction program. Agricultural soils are recognized as a critical resource for the overall prosperity of Vermont's agricultural community and for the public at large. Efforts to build soil organic matter, increase biological activity, and reduce compaction, including reduced tillage, use of composts, establishing crop rotations, cover cropping, and the elimination of annual cropping on highly vulnerable lands, will be essential to the success of programs whose goal is to improve Vermont's water quality. The Vermont Agency of Agriculture, Food and Markets supports and endorses all practices that lead to the goal of healthy soils and productive agricultural lands.

- 1.2 Enabling Legislation: As defined in 6 V.S.A. §§ 4810 and 4810a, the Required Agricultural Practices (RAPs) shall be management standards to be followed by all persons engaged in farming in this State. These standards shall address activities which have a potential for causing agricultural pollutants to enter the groundwater and waters of the State, including dairy and other livestock operations, all forms of crop and nursery operations and on-farm or agricultural fairground registered pursuant to 20 V.S.A. § 3902, and livestock and poultry slaughter and processing activities. The RAPs shall include, as well as promote and encourage, practices for farmers in preventing agricultural pollutants from entering the groundwater and waters of the State when engaged in animal waste management and disposal, soil amendment applications, plant fertilization, and pest and weed control. Persons engaged in farming who are in compliance with these practices shall be presumed to not have a discharge of agricultural pollutants to waters of the State. The RAPs shall be designed to protect water quality and shall be practical and cost-effective to implement, as determined by the Secretary.
- 1.3 Purpose: The RAPs are farm and land management practices that will control and reduce agricultural nonpoint source pollution and subsequent nutrient losses from farm fields and production areas to surface and ground waters of the State or across property boundaries. The RAPs also establish minimum construction and siting requirements for farm structures in floodplains, floodways, river corridors, and flood hazard areas.
- 1.4 Authority: 6 V.S.A. Chapter 215 (Agricultural Water Quality), including §§ 4810, 4810a, and 4811, and Act 64 of the Vermont General Assembly (2015 session).

- 1.5 **Enforcement:** Violations of this rule are subject to enforcement by the Secretary of the Vermont Agency of Agriculture, Food and Markets and the Attorney General under the provisions of 6 V.S.A. §§ 4991 - 4996 and additional remedies available to the State under other applicable Vermont law.
- 1.6 **Further considerations under the RAPs:** 6 V.S.A. § 4810a(b) requires that on or before January 15, 2018, the Secretary of Agriculture, Food and Markets shall amend by rule the Required Agricultural Practices in order to include requirements for reducing nutrient contribution to waters of the State from subsurface tile drainage. As part of the rule amendment process, the Secretary may also evaluate the current status of effectiveness of the Required Agricultural Practices, the implementation of additional best management practices, and the current water quality condition of waters of the State. The Secretary may consider additional changes to the Required Agricultural Practices, as appropriate, to meet the water quality goals of the State.

Section 2. Definitions

- 2.01 **Agency** means the Vermont Agency of Agriculture, Food and Markets.
- 2.02 **Agricultural Product** means any raw agricultural commodity, as defined in 6 V.S.A. § 21(6), that is principally produced on the farm and includes products prepared from the raw agricultural commodities principally produced on the farm.
- 2.03 **Annual Cropland** means, for the purposes of this rule, land devoted to the production, cultivation, harvesting, and management of annual row crops, including sweet corn and pumpkins, but does not include:
 - (a) vegetable, fruit, or berry crops grown for human consumption; and
 - (b) small grains.
- 2.04 **ANR** means the Vermont Agency of Natural Resources, and the Secretary of the Vermont Agency of Natural Resources and her or his designees.
- 2.05 **Barnyard** and **Feedlot** means an area, either earthen or improved, where animals are confined by fences, other structures, or topography, are primarily sustained by supplemental feed, and where vegetation cover is sparse.
- 2.06 **Buffer Zone** means an area of perennial vegetation between the edge of cropland and:
 - (a) the top of the bank of an adjoining water of the State;
 - (b) a ditch that is not a surface water under State law and that is not a water of the United States under federal law; and
 - (c) surface inlets or open drains.

- 2.07 Certified Small Farm means a farm that meets the criteria of Section 4.1 of this rule.
- 2.08 Compost means a stable, humus-like material produced by the controlled biological decomposition of organic matter through active management, but shall not mean sewage, septage, or materials derived from sewage or septage.
- 2.09 Cover Crop means a temporary vegetative crop established for the purpose of:
- (a) reducing erosion and runoff; and
 - (b) enhancing soil health by providing organic matter in cropland.
- 2.10 Crop and Cropland, for the purposes of this rule, means:
- (a) plants grown for food, feed, fiber (other than trees grown for silvicultural or timber purposes), Christmas trees, maple sap, horticultural, viticultural, orchard crops, and pasture; and
 - (b) the land upon which they are grown.
- 2.11 Custom Applicator means a person who is engaged in the business of applying manure or other agricultural wastes to land and who charges or collects other consideration for the service including full-time employees of a person engaged in the business of applying manure or agricultural wastes to land.
- 2.12 Discharge means the placing, depositing, or emission of any wastes, directly or indirectly, into an injection well or into waters.
- 2.13 Ditch means a constructed channel for the collection of field runoff water or shallow groundwater and its conveyance to an outlet.
- 2.14 Farm means a parcel or parcels of land owned, leased, or managed by a person and devoted primarily to farming, as defined in Section 2.16 of this rule, and that meets the threshold criteria as established in Section 3 of this rule, provided that the lessee controls the leased lands to the extent they would be considered as part of the lessee's own farm. Indicators of control may include whether the lessee makes day-to-day decisions concerning the cultivation or other farming-related use of the leased lands and whether the lessee manages the land for farming during the leased period.
- 2.15 Farm Structure means a structure that is used by a person for farming, including a silo, a building to house livestock or raise horticultural or agronomic plants, or customarily used to carry out the agricultural practices defined in Section 3.2 of this rule. A farm structure includes a barnyard or waste management system, either of which is created from an assembly of materials, including the supporting fill necessary for structural integrity, but excludes a dwelling for human habitation. A farm structure also

must be used by a person who can demonstrate meeting the minimum threshold criteria as found in Section 3.1 of this rule.

2.16 Farming means:

- (a) the cultivation or other use of land for growing food, fiber, Christmas trees, maple sap, or horticultural, viticultural, and orchard crops; or
- (b) the raising, feeding, or management of livestock, poultry, fish, or bees; or
- (c) the operation of greenhouses; or
- (d) the production of maple syrup; or
- (e) the on-site storage, preparation, and sale of agricultural products principally produced on the farm; or
- (f) the on-site storage, preparation, production, and sale of fuel or power from agricultural products or wastes principally produced on the farm; or
- (g) the raising, feeding, or management of four or more equines owned or boarded by the farmer, including training, showing, and providing instruction and lessons in riding, training, and the management of equines.

2.17 Fertilizer means any substance containing one or more recognized plant nutrients that is used for its plant nutrient content and that is designed for use or claimed to have value in promoting plant growth or health, except unprocessed animal or vegetable manures and other products exempted by the Secretary.

2.18 Flood Hazard Area means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year (a.k.a. 100-yr flood). The term has the same meaning as "area of special flood hazard" under 44 C.F.R. § 59.1. The area may be designated as Zone A or AE on the National Flood Insurance Program maps.

2.19 Floodplain means any land area susceptible to being inundated by water from any source.

2.20 Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base (one percent annual chance) flood without cumulatively increasing the water surface elevation more than one foot at any point. Flood hazard areas and floodways may be shown on separate National Flood Insurance Program map panels.

2.21 Food Processing Residual means the remaining organic material from a food processing plant and may include whey and other dairy, cheese making, and ice cream residuals or residuals from any food manufacturing process excluding slaughtering and rendering operations. It does not include materials from markets, groceries, or restaurants.

- 2.22 Groundwater means water below the land surface in a zone of saturation, but does not include surface waters.
- 2.23 Groundwater Quality Standards means the primary and secondary groundwater quality standards listed in Appendix One of the Groundwater Protection Rule and Strategy in accordance with 10 V.S.A. Chapter 48 (Groundwater Protection).
- 2.24 Livestock means cattle, cow/calf pairs, youngstock, heifers, bulls, American bison, swine, sheep, goats, horses, cervids, camelids, ratites, rabbits, pheasants, chukar partridge, coturnix quail, laying hens, broilers, ducks, turkeys, or any other type of fowl as designated by the Secretary. Other livestock types may be designated by the Secretary based on the potential to generate nutrients or other associated agricultural wastes.
- 2.25 Manure means livestock waste in solid or liquid form that may also contain bedding, spilled feed, water, milkhouse waste, or soil.
- 2.26 Nonpoint Source Pollution for the purposes of this rule, means agricultural wastes that reach surface water or groundwater indirectly or in a diffuse manner as a result of farming.
- 2.27 Person means:
- (a) an individual, partnership, corporation, association, unincorporated organization, trust, or other legal or commercial entity, including a joint venture or affiliated ownership; or
 - (b) a municipality or state agency; or
 - (c) individuals and entities affiliated with each other for profit, consideration, or any other beneficial interest derived from agricultural management, including lessors and lessees.
- 2.28 Pesticide means economic poison as defined in 6 V.S.A. § 911(5) and Section I 22 of the Vermont Regulations for Control of Pesticides.
- 2.29 Principally Produced means that more than 50% (either by weight or volume) of raw agricultural products that are stored, prepared, or sold at the farm are also grown or produced on the farm.
- 2.30 Production Area means those areas of a farm where animals, agricultural inputs, or raw agricultural products are confined, housed, stored, or prepared whether within or without structures, including barnyards, raw materials storage areas, heavy use areas, fertilizer and pesticide storage areas, and waste storage and containment areas. Production areas include egg washing or egg processing facilities, milkhouses, raw agricultural commodity

- preparation or storage, or any area used in the storage, handling, treatment, or disposal of mortalities.
- 2.31 River Corridor means the land area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of a dynamic equilibrium condition and for minimization of fluvial erosion hazards, as delineated by the Agency of Natural Resources in accordance with river corridor protection procedures.
- 2.32 Secretary means the Secretary of the Agency of Agriculture, Food and Markets and her or his designees.
- 2.33 Small Farm means a small farm as defined in 6 V.S.A. § 4871.
- 2.34 Subsurface Tile Drainage means a conduit installed in cropland beneath the ground surface to collect and/or convey water to an outlet.
- 2.34~~5~~5 Surface Inlet or Open Drain means an aboveground structure that receives, collects, or redirects field runoff water to other underground drainage or ditches.
- 2.35~~6~~6 Surface Water or Waters means all rivers, streams, brooks, reservoirs, ponds, lakes, springs, and all bodies of surface waters, artificial or natural, which are contained within, flow through, or border the state or any portion of it.
- 2.36~~7~~7 Top of Bank means the point along the bank of a surface water or ditch where an abrupt change in slope is evident, and where the surface water is generally able to overflow the banks and enter the adjacent floodplain during an annual flood event. Annual flood event shall be determined according to the Agency of Natural Resources' Flood Hazard Area and River Corridor Protection Procedure.
- 2.37~~8~~8 Vegetable Production means the production of all true vegetables and all commonly known vegetables that are technically fruits, including, but not limited to, peppers, tomatoes, eggplants, and peas.
- 2.38~~9~~9 Waste or Agricultural Waste means material originating or emanating from a farm that is determined by the Secretary or the Secretary of Natural Resources to be harmful to the waters of the State, including: sediments; minerals, including heavy metals; plant nutrients; pesticides; organic wastes, including livestock waste, animal mortalities, compost, feed and crop debris; waste oils; pathogenic bacteria and viruses; thermal pollution; silage runoff; untreated milkhouse waste; and any other farm waste as the term "waste" is defined in 10 V.S.A. § 1251(12).
- 2.39~~40~~40 Waste Management System means an on-farm waste management program and conservation practices which may include a combination of:

(a) an adequately sized waste storage facility, field stacking, composting, leachate control systems, bedded pack systems, and milkhouse waste systems;

(b) contracts which transfer the ownership of wastes generated at a production area to another person for management in a manner determined by the Secretary; and/or,

(c) a nutrient management plan (NMP) for all wastes to be applied in compliance with this rule.

2.401 Waste Storage Facility means an impoundment made for the purpose of storing agricultural waste by constructing an embankment, excavating a pit or dugout, fabricating an in-ground or above-ground structure, or any combination thereof.

2.412 Waters of the State include, for the purposes of this rule, surface water and groundwater as applied.

2.423 Water Supply means a drinking water source that intersects the water table and provides water through pipes or other conveyances and includes drilled wells, dug wells, driven point wells, and natural springs.

Section 3. Required Agricultural Practices Activities and Applicability

3.1 Persons engaged in farming and the agricultural practices as defined in Section 3.2 of this rule and who meet the minimum threshold criteria for applicability of this rule as found in Section 3.1(a) – (g) must meet all applicable Required Agricultural Practices conditions, restrictions, and operating standards. Persons engaged in farming who are in compliance with these conditions, restrictions, and operating standards, as applicable, shall be presumed to not have a discharge of agricultural wastes to waters of the State. Compliance with the Required Agricultural Practices Rule is required if a person:

(a) is required to be permitted or certified by the Secretary, consistent with the requirements of 6 V.S.A. Chapter 215 and this rule; or

(b) has produced an annual gross income from the sale of agricultural products of \$2,000.00 or more in an average year; or

(c) is preparing, tilling, fertilizing, planting, protecting, irrigating, and harvesting crops for sale on a farm that is no less than 4.0 contiguous acres in size; or

(d) is raising, feeding, or managing at least the following number of adult livestock on a farm that is no less than 4.0 contiguous acres in size:

(1) four equines;

(2) five cattle, cows, or American bison;

- (3) 15 swine;
- (4) 15 goats;
- (5) 15 sheep;
- (6) 15 cervids;
- (7) 50 turkeys;
- (8) 50 geese;
- (9) 100 laying hens;
- (10) 250 broilers, pheasant, Chukar partridge, or Coturnix quail;
- (11) three camelids;
- (12) four ratites;
- (13) 30 rabbits;
- (14) 100 ducks;
- (15) 1,000 pounds of cultured trout; or
- (16) other livestock types, combinations, or numbers as designated by the Secretary based upon or resulting from the impacts upon water quality consistent with this rule; or

(e) is raising, feeding, or managing other livestock types, combinations, and numbers, or managing crops or engaging in other agricultural practices on less than 4.0 contiguous acres in size that the Secretary has determined, after the opportunity for a hearing, to be causing adverse water quality impacts and in a municipality where no ordinances are in place to manage the activities causing the water quality impacts; or

(f) is managed by a farmer filing with the Internal Revenue Service a 1040(F) income tax statement in at least one of the past two years; or

(g) has a prospective business or farm management plan, approved by the Secretary, describing how the farm will meet the threshold requirements of this section.

3.2 The agricultural practices on farms meeting the minimum threshold criteria set forth in Section 3.1 that are governed by this rule include:

- (a) the confinement, feeding, fencing, and watering of livestock;
- (b) the storage and handling of agricultural wastes principally produced on the farm;
- (c) the collection of maple sap principally produced from trees on the farm and/or production of maple syrup from sap principally produced on the farm;
- (d) the preparation, tilling, fertilization, planting, protection, irrigation, and harvesting of crops;
- (e) the ditching and subsurface drainage of farm fields and the construction of farm ponds;
- (f) the stabilization of farm fields adjacent to banks of surface water, and the establishment and maintenance of vegetated buffer zones and riparian buffer zones;
- (g) the construction and maintenance of farm structures, farm roads, and associated infrastructure;
- (h) the on-site storage, preparation, production, and sale of fuel or power from agricultural products or wastes principally produced on the farm;
- (i) the on-site storage, preparation, and sale of agricultural products principally produced on the farm from raw agricultural commodities principally produced on the farm;
- (j) the on-site storage of agricultural inputs for use on the farm including, but not limited to, lime, fertilizer, pesticides, compost and other soil amendments, and the equipment necessary for operation of the farm; and
- (k) the management of livestock mortalities produced on the farm.

Section 4. Small Farm Certification and Training Requirements

4.1 As used in this section, "Certified Small Farm" means:

- (a) (1) a parcel or parcels of land on which 10 or more acres are used for the raising, feeding, or management of livestock;
- (2) that house no more than the number of animals specified under 6 V.S.A. § 4857(2) (Medium Farm definition); and
- (3) that house at least the following numbers and types of livestock:

- (A) 50 mature dairy cows;
 - (B) 75 youngstock or heifers;
 - (C) 75 veal calves;
 - (D) 75 cattle or cow/calf pairs;
 - (E) 188 swine weighing over 55 pounds;
 - (F) 750 swine weighing less than 55 pounds;
 - (G) 40 equines;
 - (H) 750 sheep or goats;
 - (I) 4,125 turkeys;
 - (J) 2,250 laying hens or broilers with a liquid manure handling system;
 - (K) 6,250 laying hens or broilers without a liquid manure handling system;
 - (L) 375 ducks with a liquid manure handling system;
 - (M) 2,500 ducks without a liquid manure handling system;
 - (N) any other animal type, number, or combination of animals as designated by the Secretary that is having an adverse impact on water quality; or
 - (O) any combination of more than one animal type exceeding 90,000 pounds of total live animal weight (animal units); or
- (b) farms on a parcel or parcels of land greater than 50 acres used for the preparation, tilling, fertilization, planting, protection, irrigation, and harvesting of annual cropland where fertilizer, manure, or agricultural wastes are mechanically applied to said parcel or parcels; or
- (c) farms on a parcel or parcels of land greater than 50 acres used for the preparation, tilling, fertilization, planting, protection, irrigation, and harvesting of vegetable production where fertilizer, manure, or agricultural wastes are mechanically applied to said parcel or parcels; or

(d) that the Secretary has designated, on a case-by-case basis after an opportunity for a hearing, as a farm required to comply with the certification requirements pursuant to 6 V.S.A. § 4871(c) based on the farm's management, agricultural inputs used by the farm, tillage practices used by the farm, agricultural wastes generated by the farm, and the associated actual or potential water quality impacts.

4.2 On a case-by-case basis after an opportunity for a hearing, the Secretary may designate a farm as not being required to comply with the certification requirements pursuant to 6 V.S.A. § 4871(c) upon a determination that the farm does not pose a threat of discharge to a water of the State or does not pose a threat of contamination to groundwater.

4.3 Certified Small Farms shall annually certify compliance with the Required Agricultural Practices Rule. Certification shall be in a manner and schedule established by the Secretary.

(a) Certified Small Farms may be inspected at any time for the purposes of assessing compliance by the farm with the Required Agricultural Practices Rule.

(b) The Secretary may prioritize inspections and inspection frequency based on the identified water quality or compliance issues posed by a farm. Certified Small Farms shall be scheduled for inspection at least once in every seven-year period commencing at the receipt by the Secretary of certification.

(c) A person who owns or leases a Certified Small Farm shall notify the Secretary of a change of ownership or change of lessee of a Certified Small Farm within 30 days of the change. The notification shall include the certification of farm compliance and shall be submitted by the new owner or lessee.

Section 5. Agricultural Water Quality Training

(a) Owners or operators of certified small farms, permitted medium farms, or permitted large farms shall obtain water quality training as approved by the Secretary. Training shall provide information regarding:

(1) the prevention of discharges;

(2) the mitigation and management of stormwater runoff;

(3) statutory and regulatory requirements of the operation of a large, medium, or small farm and financial resources available to assist in compliance;

(4) the mechanical application of manure or nutrients and methods or techniques used to minimize the runoff of applied manure or nutrients to waters of the State;

(5) weather and soil conditions that increase the risk of runoff of manure or nutrients to waters of the State; and

(6) standards for nutrient management including nutrient management planning.

(b) Large Farm Operations, Medium Farm Operations, and Certified Small Farm Operations shall obtain four hours of approved training at least once in every five years. This requirement will commence upon notice from the Secretary.

(c) The Secretary may approve training offered by other entities upon request of the entity providing the training. All requests for training approval shall be provided to the Secretary at least 30 days prior to the scheduled training dates. The entity will be required to submit information about the training and attendees in a manner requested by the Secretary.

Section 6. Required Agricultural Practices; Conditions, Restrictions, and Operating Standards

6.01 Discharges

(a) Farms shall not create any discharge of agricultural wastes to surface waters of the State through a discrete conveyance such as, but not limited to, a pipe, ditch, or conduit without a permit from the Secretary of ANR.

(b) Production areas, barnyards, animal holding or feedlot areas, manure storage areas, and feed storage areas shall utilize runoff and leachate collection systems, diversion, or other management strategies in order to prevent the discharge of agricultural wastes to surface water or groundwater.

6.02 Storage of Agricultural Wastes and Agricultural Inputs

(a) All agricultural wastes shall be managed in a manner to prevent runoff or leaching of wastes to waters of the State or across property boundaries.

(b) All components of a waste management system, including waste storage facilities, shall be managed and maintained so as to prevent structural or mechanical failures.

(c) Waste Storage Facilities maintenance and construction shall ensure:

(1) Vegetation is managed so that the facility maintains structural integrity and prevents leaks or overflows at all times.

(2) Waste Storage Facilities are managed to provide adequate volume in order to prevent overflows at all times.

(3) All waste storage facilities constructed, expanded, or modified after July 1, 2006 are designed and constructed according to the United States Department of Agriculture's Natural Resources Conservation Service (USDA NRCS) standards and specifications or an equivalent standard certified by a professional engineer licensed in the State of Vermont. Waste Storage Facilities shall be managed and maintained consistent with the requirements of the Operation and Maintenance Plans for the facility.

(d) The Secretary may require, on a case-by-case basis, that the owner or operator of a waste storage facility certify compliance with standards established by the USDA NRCS for waste storage facilities, or an equivalent standard certified by a professional engineer licensed in the State of Vermont.

(e) Field stacking of manure or other agricultural wastes on sites not approved consistent with USDA NRCS standards, or otherwise approved by the Secretary:

(1) shall consist of a stackable material that is no less than 20% solids and be able to stack four feet high; and

(2) shall be prohibited on lands in a floodway or subject to annual flooding; and

(3) shall be prohibited on exposed bedrock; and

(4) shall not be sited within:

(A) 200 feet of the top of bank of surface water;

(B) 200 feet of a public or private water supply;

(C) 100 feet from a property line;

(D) 100 feet from a ditch or conveyance to surface water;

(E) areas subject to concentrated runoff; or

(F) 100 feet of subsurface tile drainage;

(f) The Secretary may authorize site-specific standards other than those listed in Section 6.02(e)(4)(A)-~~(EF)~~ when the Secretary determines that a manure stacking or piling site, fertilizer storage, or other nutrient storage will not have an adverse impact on groundwater quality or surface water quality but in no case shall

unimproved manure stacking sites be located less than 100 feet from a private water supply or the top of the bank of surface water.

(g) Over a three-year period, field stacked agricultural wastes shall be land applied consistent with the nutrient management plan requirements of Section 6.03, actively managed as a compost, or moved to a suitable alternative location.

(h) Fertilizer shall be stored consistent with the Vermont Fertilizer and Lime Regulations Section XIII. Fertigation and chemigation equipment shall be operated with an adequate anti-siphon device between the system and the water source.

(i) Pesticides shall be used in accordance with 6 V.S.A. Chapter 87 (Control of Pesticides) and all regulations promulgated thereunder.

6.03 Nutrient Management Planning

(a) All Certified Small Farm Operations as defined in Section 4 of this rule and all permitted Medium and Large Farm Operations managing manure, agricultural wastes, or fertilizer for use as nutrient sources shall implement a field-by-field nutrient management plan consistent with the requirements of the USDA NRCS Nutrient Management Practice Code 590 or other equivalent standards approved by the Secretary.

(b) For all other farming operations subject to this rule, all sources of nutrients shall be accounted for when determining nutrient application rates. Recommended rates may be adjusted based on manure or other waste analysis and/or nutrient testing procedures. Recommended nutrient application rates shall be consistent with current university recommendations and standard agricultural practices.

(c) For all other farming operations subject to this rule, all fields receiving mechanical application of manure, agricultural wastes, or fertilizer shall be soil sampled at least once in every five years using modified Morgan's extractant or other equivalent standards approved by the Secretary. Records of soil analysis, manure or other agricultural waste application, and fertilizer applications shall be maintained on the farm for a period five years and provided to the Secretary upon request.

(d) Owners and operators of annual cropland, perennial grass land, or hay land who are required to implement a USDA 590 standard nutrient management plan and who have soil analyses demonstrating greater than 20 parts per million (ppm) phosphorous shall: ~~implement appropriate provisions of an approved nutrient management plan that balances excessive soil phosphorus levels with management strategies to reduce those levels, including eliminating or reducing manure applications.~~

(1) implement appropriate provisions of an approved nutrient management plan that balances excessive soil phosphorus levels with management strategies to reduce those levels, including eliminating or reducing manure applications; and

(2) apply nutrients at less than UVM phosphorus crop nutrient removal rates on cropland fields with “pattern tile drainage”, which for the purposes of this section is defined as subsurface tile drainage systematically installed in a repeating pattern.

(e) Owners and operators of farms required to implement a USDA 590 standard nutrient management plan shall document significant changes in animal numbers, management, nutrient application rates, field management, or crop management, and shall make appropriate modifications to the farm's nutrient management plan in a timely manner.

(f) The following records of manure or other agricultural waste application shall be maintained by all farms for a period of five years and shall be provided to the Secretary upon request:

- (1) date of application;
- (2) field location;
- (3) application rate;
- (4) source of nutrients applied; and
- (5) weather and field conditions at the time of application.

6.04 Soil Health Management; Cover Crop Requirements

(a) Soil management activities that increase organic matter, reduce compaction, promote biological activity, reduce erosion, and maintain appropriate nutrient levels shall be considered and implemented as practicable. Practices that promote these goals include reduced tillage, conservation tillage, avoiding mechanical activities on saturated soils, addition of organic matter using manure, green manures and compost, sod and legume rotations, and the use of cover crops.

(b) Cropland shall be cultivated in a manner that retains soil in the field and promotes soil health while minimizing visible erosion into buffer strips, across property boundaries, or that creates gully erosion. The performance management standard for the soil must result in an average soil loss less than or equal to the soil loss tolerance (T) for the prevalent soil type as calculated through application of the Revised Universal Soil Loss Equation 2 or through the application of similarly accepted models.

(c) Croplands shall be managed to prevent fieldborne gully erosion and reduce or eliminate associated sediment discharges using management strategies that may include the establishment of grassed waterways, filter strips, or other methods deemed appropriate by the Secretary.

(d) Annual croplands subject to frequent flooding from adjacent surface waters, as described in the USDA Soil Survey Flooding Frequency Class, shall be required to be planted to cover crops. Broadcast seeding must be completed by October 1 of each year. Seed planted with drill seeders or otherwise incorporated shall be completed by October 15 of each year. The Secretary may, on a case-by-case basis, approve alternative planting dates due to unusual soil or weather conditions or other specific crop management needs and upon request of the owner or operator of a farm managing annual croplands subject to frequent flooding from adjacent surface waters, as described in the USDA Soil Survey Flooding Frequency Class. If annual crops cannot be harvested prior to October 15, then 30% crop residue, growing directly in the soil, must remain in order to limit soil loss.

6.05 Manure and Waste Application Standards and Restrictions

(a) Manure or other agricultural wastes shall not be applied between December 15 and April 1. The Secretary may prohibit the application of manure to land in the State following adequate notice to the agricultural community between December 1 and December 15 and between April 1 and April 30 of any calendar year when the Secretary determines that due to weather conditions, soil conditions, or other limitations, application of manure to land would pose a significant potential of runoff to waters of the State.

(b) Manure or other agricultural wastes shall not be applied to cropland, perennial grass land, small grain cropland, or hay land subject to frequent flooding from adjacent surface waters, as described in the USDA Soil Survey Flooding Frequency Class, after October 16 or before April 14.

(c) Manure or other agricultural wastes applied to annual cropland subject to frequent flooding, as described in the USDA Soil Survey Flooding Frequency Class, shall be injected or otherwise incorporated within 48 hours of application. This requirement shall not apply to land in no-till management.

(d) Manure or other agricultural wastes shall not be applied when field conditions are conducive to flooding, runoff, ponding, or other off-site movement, or can be reasonably anticipated to result in flooding, runoff, ponding, or other off-site movement, regardless of NMP recommendations.

(e) Manure or other agricultural wastes shall not be applied in areas of croplands, perennial grass lands, or hay lands that:

- (1) are saturated with water with the potential to runoff to surface water;
- (2) are frozen or snow covered, unless the Secretary has approved an exemption consistent with the requirements of Section 6.06; or
- (3) have exposed bedrock.

(f) Manure or other agricultural wastes shall not be applied to annual cropland, vegetable cropland, or small grain cropland where the average field slope exceeds 10%, unless a permanently vegetated buffer zone of 100 feet adjacent to downslope surface water has been established. Manure shall not be applied within the buffer zone.

(g) Manure or other agricultural wastes shall not be mechanically applied within 100 feet of a private water supply or 200 feet of a public water supply. This prohibition shall not apply to private water supplies that have been established inconsistent with the Department of Environmental Conservation Water Supply Rules existing at the time that the water supply was established.

(h) Manure or other agricultural wastes shall not be applied in exceedance of nutrient recommendations such that it ceases to be useful or beneficial for plant uptake.

6.06 Manure Spreading Exemptions

(a) Manure and other agricultural wastes shall be land applied consistent with the requirements of this section unless the Secretary grants an emergency exemption because of an emergency situation such as the structural failure of a waste storage facility or has granted a seasonal exemption consistent with Section 6.06(b) – (d). In granting an emergency exemption, the Secretary shall establish requirements so that manure will be applied on fields in a manner with the least likelihood of generating runoff to surface waters.

(b) The Secretary may approve a seasonal exemption to the winter spreading ban or the restrictions on frequently flooded fields for manure applications on a case-by-case basis upon written request. Requests for an exemption shall provide:

- (1) the identification and location of specific fields to be used for winter spreading;
- (2) the proposed rates of application;
- (3) the location of nearest surface water, mapped wetlands, mapped floodplains, water supply, tile drains, surface inlets or open drains, property boundaries, and ditches;
- (4) the identification of soil types, depth to groundwater, and slopes;

- (5) the current soil test results;
- (6) the annual nutrient application plan for the fields;
- (7) the Phosphorus Index, or equivalent, results;
- (8) the RUSLE2, or equivalent, results; and
- (9) the USDA Soil Survey Flooding Frequency Class, and if applicable to the request, evidence that the flood frequency class is not accurate.

(c) All approvals for a seasonal exemption shall be in writing and shall prohibit the application of manure:

- (1) to areas with established channels of concentrated storm water runoff to surface waters;
- (2) to permanent vegetative buffer zones;
- (3) to wetlands, as that term is defined in 10 V.S.A. § 902(5);
- (4) within 200 feet of a potable water supply, as that term is defined in 10 V.S.A. § 1972(6);
- (5) to fields exceeding tolerable soil loss (T);
- (6) to saturated soils; and
- (7) to any other area as designated by the Secretary on a case-by-case basis.

(d) Approvals for seasonal exemptions to the winter spreading ban shall establish requirements and conditions for the application of manure when frozen or snow-covered soils prevent effective incorporation at the time of application, require manure to be applied according to a nutrient management plan, establish the maximum amounts of manure that may be applied per acre during any one application, and establish required manure spreading setbacks from surface water, water supplies, and other water conveyances. Seasonal exemptions to the winter spreading ban may be renewed annually upon request and submission of winter spreading records of application.

6.07 Buffer Zones: Manure and Agricultural Wastes Application Setbacks

A vegetative buffer zone of perennial vegetation shall be maintained between croplands and the top of the bank of adjoining surface waters and ditches consistent with the criteria in (a) through (i) below:

- (a) Adjacent surface waters shall be buffered from croplands by 25 feet of perennial vegetation.
- (b) Ditches shall be buffered from croplands by 10 feet of perennial vegetation unless determined to potentially transport significant waste or nutrients to surface water consistent with the USDA 590 standard nutrient management requirements.
- (c) Surface inlets or inlets of open drains shall be buffered from croplands by 25 feet of perennial vegetation.
- (d) Mechanical application of manure or other agricultural wastes is prohibited within perennially vegetated buffer zones. Grazing of livestock consistent with the provisions of Section 7 of this rule is permitted.
- (e) The use of fertilizer or compost for the establishment and maintenance of a required vegetative buffer zone is allowed consistent with nutrient management plan requirements, soil analysis, and agronomic recommendations for the buffer zone.
- (f) Tillage within the perennially vegetated buffer zone is prohibited other than for the establishment and maintenance of the buffer zone.
- (g) Harvesting a vegetative buffer zone as a perennial crop is allowed.
- (h) Spoils from agricultural ditch maintenance shall not be stored in the buffer zone or in such a manner as to discharge to surface water.
- (i) Exceptions to the required vegetative buffer zone widths, including the requirements of Section 6.05(f), may be considered upon request on a site-specific basis according to standards approved by the Secretary, but in no case shall a buffer zone be less than 10 feet in width. Site-specific buffer zones may be approved based on field characteristics such as a determination that a conveyance has the potential to transport significant wastes or nutrients to surface water, field contours, soil types, slopes, proximity to water, nutrient management plan requirements, and other relevant characteristics when the Secretary determines that the proposed site-specific buffer zones are adequately protective of surface waters.

6.08 Animal Mortality Management Requirements

(a) Animal mortalities shall be properly stored, handled, and disposed of within 48 hours, so as to minimize adverse water quality impacts.

(b) Animal mortalities buried on farm property shall be sited so as to be:

(1) a minimum of 150 feet from property lines and the top of the bank of surface waters;

(2) a minimum of three feet above the seasonal high water table and bedrock;

(3) covered with a minimum of 24 inches of soil;

(4) a minimum of 200 feet from public or private drinking water supplies; and

(5) not located on lands in a floodway or subject to annual flooding.

(c) Animal mortalities composted or otherwise disposed of on farm property on unimproved sites shall be prohibited on lands in a floodway or subject to annual flooding, and shall be sited so as to be:

(1) a minimum of 200 feet from property lines;

(2) a minimum of 200 feet from the top of the bank of surface waters;

(3) a minimum of 200 feet from public or private drinking water supplies not owned by the farm;

(4) a minimum of 300 feet from neighboring residences or public buildings;

(5) a minimum of 100 feet from a ditch or conveyance to surface water; and

(6) not upon areas of exposed bedrock.

(d) Other site-specific standards may be authorized by the Secretary, but in no case shall unimproved sites be located less than 100 feet from a private water supply, property boundary, or the top of the bank of surface water.

6.09 On-Farm Composting of Imported Food Processing Residuals

(a) All on-farm composting facilities importing less than 1,000 cubic yards per year of food processing residuals shall be sited so as to be at a minimum:

- (1) 200 feet from the top of bank of surface water;
- (2) 200 feet from a public or private water supply not owned by the farm;
- (3) 300 feet from a neighboring residence or public building;
- (4) 200 feet from a property line;
- (5) 100 feet from a ditch or conveyance to surface water;
- (6) not within floodways, areas subject to annual flooding or concentrated runoff; and
- (7) not upon areas of exposed bedrock.

(b) Other site-specific standards may be authorized by the Secretary, but in no case shall unimproved sites be located less than 100 feet from a private water supply, property boundary, or the top of the bank of surface water.

6.10 Stabilization of Banks of Surface Waters

(a) The areas from the top of a bank of surface water to the edge of the surface water shall be left in their natural state except as allowed by State statute including, but not limited to, 10 V.S.A. § 1021, and the standards established for the pasturing of livestock consistent with Section 7 of this rule.

(b) Stabilization of farm field banks of surface waters, when allowed under Section 6.10(a) of this rule, shall be constructed in accordance with the USDA NRCS standards and specifications or other standards approved by the ANR and the Agency that are consistent with policies adopted by the Secretary of Natural Resources to reduce fluvial erosion hazards.

Section 7. Exclusion of Livestock from the Waters of the State

(a) Adequate vegetative cover shall be maintained on banks of surface waters by limiting livestock trampling and equipment damage to protect banks of surface waters to minimize erosion.

(b) Crossings and watering areas need to be maintained so as to minimize erosion and be adequately protective of surface waters.

(c) Livestock shall not have access to surface water in production areas or immediately adjacent to production areas, except:

- (1) at livestock crossings or watering areas;
- (2) in areas prescribed by a rotational grazing plan consistent with NRCS standards or an equivalent standard, and approved by the Secretary. Approved grazing plan areas shall maintain at least an average of three inches of vegetative growth within 25 feet of the top of bank of surface water, and within 10 feet of the top of bank of ditches; or
- (3) in areas approved by the Secretary based on site-specific characteristics and management requirements.

(d) Livestock shall not have access to surface water in areas outside of production areas that:

- (1) contain unstable banks or where erosion is present; or
- (2) are areas designated by the Secretary as having actual or potential threat to water quality as a result of livestock access.

(e) Livestock shall not be pastured within 50 feet of a private water supply without the permission of the water supply owner. This prohibition shall not apply to private water supplies that have been established inconsistent with the Department of Environmental Conservation Water Supply Rules existing at the time that the water supply was established.

Section 8. Ground Water Quality and Groundwater Quality Investigations

- (a) Farm operations shall be conducted so that the concentration of wastes in groundwater originating from agricultural operations do not reach or exceed the primary or secondary groundwater quality enforcement standards identified by Appendix One of the Groundwater Protection Rule and Strategy in accordance with 10 V.S.A. Chapter 48 (Groundwater Protection).
- (b) Farm operations shall be conducted with the goal of reducing the concentration of wastes in groundwater to the preventive action levels (PALs) of the primary or secondary groundwater quality standards identified by Appendix One of the Groundwater Protection Rule and Strategy when monitoring indicates the presence of these wastes in groundwater that exceed the enforcement standard.
- (c) The Secretary may conduct groundwater quality monitoring to assess the impact of agricultural practices and farm operations on the quality of drinking water and groundwater. The Secretary may conduct groundwater sampling at sites:
 - (1) selected by the Secretary where water supply owners or tenants have volunteered or agreed to participate in the sampling program;

(2) upon the request of a water supply owner or tenant;

(3) selected by the Secretary based on the results of other sampling data or the existence of vulnerable site characteristics; or

(4) with activities or operations permitted, certified, or regulated by the Secretary.

(d) The Secretary shall conduct a groundwater investigation where the Secretary has received a complaint from a water supply owner in the vicinity of a farm that the farm or its agricultural practices has contaminated the drinking water or groundwater of the water supply owner.

(e) The Secretary shall conduct a groundwater investigation where sampling indicates that drinking water or groundwater contains detectable concentrations of agricultural wastes.

(f) The Secretary shall provide:

(1) written notification of testing results to each individual water supply owner and tenant, if known, that participates in the sampling program.

(2) property owners in the vicinity of farm operations and agricultural lands with the test results for each water supply owned by them that is sampled by the Secretary.

(3) farm operations with the test results for water supplies owned by the farm operation and, upon request, for water supplies adjacent to or impacted by the crop land or facilities managed by the farm operation.

(g) In order to identify and remediate sources of drinking water and groundwater contamination, the Secretary, without limitation, may:

(1) conduct site visits to interview property owners and farm operators, gain an understanding of the physical characteristics of the landscape and locate additional sites for water quality sampling;

(2) communicate with farm operators and adjacent property owners to identify practices and activities that are potential sources of contamination;

(3) conduct additional sampling to confirm the detection of contaminants and to determine the extent and scope of contamination at the site;

(4) require corrective actions such as changes in activities, management practices, cropping patterns, or structural revisions designed to reduce the

contamination from current activities and prevent contamination from future activities;

(5) conduct follow up water quality sampling to determine the effectiveness of changes made or corrective actions taken;

(6) seek additional investigative or consultation resources to evaluate and characterize sites to determine vulnerability to drinking water and groundwater contamination; and

(7) review testing results and site evaluations to determine if changes in water quality data are the result of changes in activities or natural site conditions.

(h) The Secretary may require the owner or operator of a waste storage facility to modify the facility to meet the USDA NRCS or an equivalent standard for the facility or to implement additional management measures if the facility poses a threat to human health or the environment as established by an exceedance of the State's Groundwater Quality Standards.

(i) For the purpose of assessing whether a waste storage facility is violating the State's Groundwater Quality Standards, the Secretary shall pay for the initial costs to conduct groundwater monitoring. When the Secretary has made a determination that a waste storage facility is violating the State's Groundwater Quality Standards, the Secretary shall provide notification to the Department of Health and the Agency of Natural Resources. This notification shall occur within 21 days and include the location of the facility and the name of the owner or operator. When the Secretary makes a determination that a waste storage facility no longer poses a threat to human health or the environment, the Secretary shall provide notification of the revised determination to the Department of Health and the ANR.

Section 9. Construction of Farm Structures

(a) Siting

(1) Prior to construction of farm structures, the farmer must notify the zoning administrator or the town clerk of the town in which the farm structure is proposed, in writing, of the proposed construction activity. The notification must contain a sketch of the proposed structure including the setback distances from adjoining property lines, road rights-of-way, and adjacent surface water.

(2) Local setbacks and setbacks designed by this rule shall be observed unless the Secretary has approved a farmer's written request for other

reasonable setbacks for the specific farm structure being constructed or maintained in accordance with Section 9(b).

(3) Construction of farm structures in Flood Hazard Areas and River Corridors are required to obtain a Flood Hazard Area and River Corridor permit from the ANR or its designee unless otherwise exempt (refer to Appendix A). Fences through which floodwater may flow are not structures which represent an encroachment in a floodway area.

(4) Construction of new farm structures, specifically buildings and other farm structures that disturb one or more acres of land must obtain authorization from the ANR before commencing with land disturbance or construction activities.

(5) Existing Production Areas

Farm structures, with the exception of replacement structures built to occupy existing structural footprints, shall be constructed so that a minimum distance of 50 feet is maintained between the top of the bank of adjoining surface waters and the farm structure.

(A) Such structures do not include those solely constructed for irrigation, drainage, fencing, or livestock watering,

(B) Such structures do not include water quality conservation practices where the site is the best available site on the farm, as approved by the Secretary, for the purposes of protecting ground water quality or surface water quality.

(C) Such structures do not include waste storage facilities if the site is the best available site on the farm, as approved by the Secretary, for the purposes of protecting ground water quality or surface water quality and the waste storage facility is designed by a licensed engineer.

(6) New Production Areas

(A) Farm structures, excluding waste storage facilities, shall be constructed so that a minimum distance of 50 feet is maintained between the top of the bank of adjoining surface waters and the farm structure.

(i) Such structures do not include those solely constructed for irrigation, drainage, fencing, or livestock watering,

(ii) Such structures do not include water quality conservation practices where the site is the best available site on the farm, as approved by the Secretary, for the purposes of protecting ground water quality or surface water quality.

(B) The following setbacks shall apply to all new waste storage facilities proposed on sites where no waste storage facility or production area previously existed:

- (i) 100 feet from the centerline of a public road;
- (ii) 100 feet from any abutting property line;
- (iii) 200 feet from the top of the bank of any surface water; and
- (iv) 200 feet from public or private water supplies.

(b) Setbacks Approved by the Secretary

Local setbacks or no build areas for wetlands, River Corridors, and other setbacks applicable to all development in a local zoning bylaw established by the municipality shall be maintained, unless upon written request of the person, consistent with the procedures found in Appendix A, the Secretary has approved other reasonable setbacks for the specific farm structure being constructed. The Secretary may authorize the siting of a waste storage facility within 200 feet of a surface water or private water supply if the site is the best available site on the farm for the purposes of protecting ground water quality or surface water quality and the waste storage facility is designed by a licensed engineer to meet USDA NRCS standards and specifications or an equivalent standard. If an equivalent design standard is used, the design and construction shall be certified by the Secretary, or a licensed professional engineer operating within the scope of his or her expertise. The Secretary may consider the following in rendering a decision regarding alternative setbacks:

- (1) unique existing physical conditions or exceptional topographical or other physical constraints peculiar to the particular property that would prevent development in accordance with this rule;
- (2) because of such physical conditions or constraints, there is no possibility that the property can be developed in conformity with the provisions of this rule and that the approval of an alternative setback is therefore necessary to enable the reasonable operation of the farm;

(3) the alternative setback, if approved by the Secretary, will be the site that is the best available on the farm for the purposes of protecting ground water quality or surface water quality; and

(4) the setback, if approved by the Secretary, will represent the minimum alternative setback necessary to allow for reasonable operation of the farm.

Section 10. Custom Applicator Certification

(a) Custom applicators of manure or other agricultural wastes shall be certified by the Secretary in order to operate within the State and shall comply with all applicable requirements of the Required Agricultural Practices Rule, Medium Farm Operations Rule and Permits, and Large Farm Operations Rule and Permits.

(b) Custom applicators shall demonstrate knowledge of Required Agricultural Practices Rule standards, Medium Farm Operation Rule and Permit requirements, Large Farm Operation Rule and Permit requirements, and the USDA NRCS Nutrient Management Practice Code 590, including manure or other wastes application restrictions, buffer zones, setback requirements, and recordkeeping requirements.

(c) Custom applicators shall demonstrate competency in methods and techniques used to minimize runoff from application sites, identification of weather or soil conditions that may increase risk of field runoff, recordkeeping, and other information deemed pertinent by the Secretary.

(d) Certified custom applicators shall train all employees and seasonal workers in methods or techniques to minimize runoff to surface water, identification of weather or soil conditions that may increase the risk of runoff, and the Required Agricultural Practices Rule, Medium Farm Operation Rule and Permit, Large Farm Operation Rule and Permit standards and restrictions for the application of manure or other agricultural wastes. Records of training shall be maintained in a manner prescribed by the Secretary.

(e) Certification shall be valid for five years from the date of issuance and shall be renewable annually on a form and in a manner prescribed by the Secretary.

(f) Certified custom applicators shall complete eight hours of training in each five-year period of certification. Completion of five-year training requirements will serve as meeting the requirements for recertification.

(g) Certified custom applicators shall maintain records of the amount of manure or agricultural waste applied by farm and field for a period of five years and provide those records to the Agency upon reasonable request.

Section 11. Site-Specific On-Farm Conservation Practices

When the Secretary determines, after inspection of a farm, that a person engaged in farming is complying with the Required Agricultural Practices Rule but there still exists the potential for agricultural wastes to enter the waters of the State, the Secretary shall require the person to implement additional, site-specific, on-farm conservation practices designed to prevent agricultural wastes from entering the waters of the State. When requiring implementation of a conservation practice, the Secretary shall inform the person engaged in farming of the resources available to assist the person in implementing the conservation practices to comply with the requirements of this rule.

Section 12. Subsurface Tile Drainage

12.1 Requirements for Subsurface Tile Drainage

For all farming operations subject to this rule, all cropland with any subsurface tile drainage must implement the following practices, unless other site-specific standards are approved by the Secretary:

(a) Concentrated feeding areas of unimproved barnyards and unimproved feedlots shall not be sited over subsurface tile drainage.

(c) New vegetative treatment areas for agricultural wastes shall not be installed within 200 feet upslope of a subsurface tile drain and new subsurface drainage shall not be installed within 200 feet downslope from the edge of an existing vegetative treatment area.

(d) Subsurface tile drainage installed or modified after January 1, 2019 shall have a rodent guard installed at the outlet of the subsurface tile drainage system.

12.2 Requirements for Surface Inlets

For all farming operations subject to this rule, no new installations of surface inlets shall be located within or adjacent to cropland. For the purposes of this section, surface inlets do not include drainage controls such as diversion structures or grade stabilization practices approved by the Secretary.

Section ~~12~~13. Severability Clause

If any provision of this rule, or the application thereof to any person or circumstance, is held invalid, such determination shall not affect other provisions or applications of this rule which can be given effect without the invalid provision or application, and to that end the provisions of this rule are severable.

Section ~~13~~14. Effective Date

This document, developed pursuant to Act 64 (2015 session), is the amended ANNOTATED TEXT of the Required Agricultural Practices (RAPs) that was submitted to the Secretary of State's Office and the Legislative Committee on Administrative Rules (LCAR) on August 24-September 4, 2018. For more information, please visit <http://agriculture.vermont.gov/rap-tile-rule> or contact the Vermont Agency of Agriculture, Food and Markets at (802) 828-2431.

~~(a) Sections 1—6.04(c), 6.05(a), and 6.05(c)—13 of this regulation shall become effective on [date of adoption]; and~~

~~(b) Sections 6.04(d) and 6.05(b) of this regulation shall become effective on April 15, 2017.~~

This regulation shall become effective on [date of adoption].

Appendix A: Process for obtaining variances

Farm Structures/Municipal Setbacks: Variances

(a) A complete petition for an alternative setback shall include:

- (1) the location of the parcel, and contact information where the applicant can be reached for additional information or clarification;
- (2) a detailed description of the farm operation and description of how the applicant is engaged in Required Agricultural Practices as defined in Section 3 of the RAPs;
- (3) a statement of the reason why less restrictive setbacks are necessary and why the setback is the least deviation possible to provide relief;
- (4) a copy of the zoning ordinance governing the tract on which the structure will be built outlining the setback requirements or a letter from the municipality with the required setback information;
- (5) the name and contact information for your town's Zoning Administrator or Town Clerk, including an affirmative statement that the town has been notified of the intent to construct a Farm Structure;
- (6) a plan of the existing structure(s) and proposed structure(s) showing the distance to all property lines from the furthest projection of the structure, including overhangs. For property lines along highway rights-of-way, measure the setback appropriately as outlined in the municipal regulations;
- (7) name(s) and address(es) of the affected adjoining property owner(s) and a description of each adjoining land use;
- (8) any letter(s) from adjoining landowners where applicable; and
- (9) certification that the farm is in compliance with all Required Agricultural Practices rules.

The Secretary bases his or her decision on facts provided by the petitioner. Failure to provide information to the Secretary could result in denial of request.

(b) Public Notice and Issuance Requirements

The Secretary will notify the municipality in writing by certified mail and copy the affected adjoining property owner(s) of his or her intent to consider a petition for an alternative setback. The notification shall include a description of the proposed project, submitted plan, and shall be accompanied by information that clearly states where additional information may be obtained. The Secretary will request that the notice be posted in a public place in the municipal office.

Any comments resulting from this posting or from the municipality must be received in writing at the Agency by 4:30 p.m. on the seventh business day following receipt of the notice.

(c) Standards

The Secretary may grant a petition for an alternate setback or grant a petition for an alternate setback with conditions, except as otherwise outlined in this rule or statutorily required, when:

- (1) there are unique existing physical conditions or exceptional topographical or other physical constraints peculiar to the particular property that would create a hardship for the farm operation;
- (2) because of such physical conditions or constraints, there is no possibility that the property can be developed in strict conformity with the provisions of this rule and that the authorization of an alternative setback is therefore necessary to enable the reasonable operation of the farm;
- (3) the hardship has not been created by the applicant;
- (4) the alternative setback, if authorized by the Secretary, will not substantially or permanently impair the appropriate use or development of adjoining property, nor be detrimental to the public health, safety, and welfare; and
- (5) the variance, if authorized by the Secretary, will represent the minimum alternative that will afford relief and will represent the least deviation possible from this rule.

* The Agency cannot approve alternate setbacks from State wetland regulations, nor approve construction within Highway rights-of-way.

Roles of Other State Agencies: Information

Public Drinking Water Supplies and Wastewater Management: Nutrients, sediment, organic matter, and microorganisms may also impact drinking water supplies derived from surface waters. Farm operations should be aware of the locations of surface drinking water source intakes and appropriately manage agricultural activities to reduce potential negative impacts. Information regarding public water supplies as well as information pertaining to wastewater systems requirements may be obtained at (802) 828-1535.

Wetlands: Farm operations should be aware of existing rules pertaining to wetlands under state and federal jurisdiction. The Natural Resources Conservation Service, U.S. Army Corps of Engineers, and the Vermont Department of Environmental Conservation coordinate all agriculture and wetland issues in Vermont. It is strongly suggested that landowners contact the U.S. Army Corps of Engineers at (802) 872-2893 and the Vermont Department of Environmental Conservation at (802) 828-1535 before initiating farm-related projects in or near wetlands.

Construction of New Farm Structures: Construction of new farm structures, specifically buildings and other farm-related structures, or other construction on the farm that disturb one or more acres of land, must obtain authorization from the ANR before commencing with land disturbance or construction activities. Approval will be issued by the ANR upon receipt of a Notice of Intent (NOI) which certifies that adequate measures for the control of erosion and sedimentation will be used during land disturbance and construction efforts. Persons needing additional information about the Construction General Permit or NOI concerning one or more acres of land disturbance are advised to contact the Watershed Management Division of the Vermont Department of Environmental Conservation's Environmental Assistance Hotline at 1-800-974-9559. Authorization by the ANR is not needed for construction or land disturbance related to cultivation, irrigation, drainage, and fencing.

Flood Hazard Area and River Corridor General Permit: An ANR General Permit for activities exempt from municipal regulation in Flood Hazard Areas and River Corridors may be required. The primary purpose for the General Permit is to fully implement the Vermont Flood Hazard Area & River Corridor Rule (effective 03/01/2015) which requires the Agency to regulate activities exempt from municipal regulation in Flood Hazard Areas and River Corridors. These activities include state-owned and operated institutions and facilities, required agricultural and silvicultural practices, and power generating and transmission facilities regulated under 30 V.S.A. §§ 248 and 248a. More information can be obtained by calling (802) 828-1535.

Solid and Hazardous Waste Management: Farm operations are required to manage all wastes generated on the farm consistent with all applicable solid waste rules and hazardous waste rules. Information regarding the proper management, storage, and disposal of hazardous waste, universal waste, used oil, and petroleum products can be obtained from the Vermont Waste Management & Prevention Division by calling (802) 828-1138. Information regarding the proper management, storage, and disposal of pesticidal waste and empty pesticide containers can be obtained from the Vermont Agency of Agriculture, Food and Markets by calling (802) 828-2431. On-farm composting or anaerobic digestion of food residuals and food processing residuals may require registration or permitting by the Vermont Waste Management & Prevention Division. More information can be obtained by calling (802) 828-1138.

Wastewater Management and Residuals Management: Farm operations generating wastewater indirect discharges or discharges to underground injection wells are advised that permits may be required from the Department of Environmental Conservation Watershed Management Division or Groundwater Protection and Management Division. The management of sewage, biosolids, and septage on a farm must be conducted consistent with the Vermont Solid Waste Management Rules and any Solid Waste Management Facility Certification authorizing these activities. Information regarding these requirements can be obtained by calling (802) 828-1535.

Water Withdrawal and Irrigation: Farm operations utilizing surface waters for irrigation purposes are advised that water withdrawals above a *de minimis* rate are required to obtain a permit from the Department of Environmental Conservation consistent with the *Procedure for Determining Acceptable Minimum Stream Flows*. More information regarding water withdrawals for irrigation purposes and permitting requirements can be obtained by calling the Watershed Management Division at (802) 828-1535.

Alteration of Streams: Stream alteration permits regulate activities that take place in or along streams. The permit program is intended to prevent the creation of flood hazards, protect against damage to aquatic life, and protect the rights of neighboring landowners. The types of activities that are regulated include streambank stabilization, road improvements that encroach on streams, bridge construction or repair, and utility crossings under streambeds. More information regarding stream alteration and permitting requirements can be obtained by calling the River Management Division at (802) 828-1535.

Spill Prevention, Control, and Countermeasure (SPCC): EPA's oil pollution prevention regulation requires facilities that are subject to regulation to prepare and implement a plan to prevent any discharge of oil into navigable waters or adjoining shorelines of the U.S. A farm must prepare a SPCC Plan if it has an aggregate aboveground storage capacity of greater than 1,320 gallons. Only containers of oil with a capacity of 55-gallons or greater are counted toward this aggregate capacity threshold. The plan is referred to as a Spill Prevention, Control, and Countermeasure (SPCC) plan. More information regarding SPCC and permitting requirements can be obtained by calling the Environmental Assistance Office at 1(800) 974-9559.

ATTACHMENT B

Required Agricultural Practices (RAP) Amendment for
Subsurface Tile Drainage

Public Comments and Testimony Received

February 28, 2018 - April 19, 2018



VERMONT AGENCY OF AGRICULTURE, FOOD AND MARKETS

SIGN-UP SHEET FOR St. Albans, March 30, 2018 PUBLIC HEARING ON

REQUIRED AGRICULTURAL PRACTICES RULE FOR THE AGRICULTURAL NONPOINT SOURCE POLLUTION CONTROL PROGRAM.

Please PRINT NAME and also indicate your hometown for identification purposes
 Speakers will be called on a first-come, first-served order, using this sign-in roster.

Name	Organization, Town of Residence & Address	Do you farm in Vermont? LFO/MFO/SFO/other / custom applicator	Do you wish to speak today? Yes/No
Cris Riverville	Riverville Farm Franklin VT 05457	SFO	N
Jack Parent	Swanton N. 05488	LFO	N
Mike Howrigan	Fairfield VT	MFO	N
Leah Thompson	FMC Georgia, PO Box 58, Swanton VT 05470	no	?
Laurie Locke	USDA FSA St. Albans, VT	No	No
Harold Hourigan	Farmer Newry	MFO	
Michael Frett	St. Albans Messenger		
Bill Rowell	VT Dairy Producers Alliance	LFO	?
Gavin Whitmore	Vermont Association of Conservation Districts	no	N
Nickel Probes	VTCD	No	No
Milton Robinson	Swanton, VT	Yes	No
Ken Bassett	NHeco	No	No
Steve Maffey	Soleno	No	No

VERMONT AGENCY OF AGRICULTURE, FOOD AND MARKETS

SIGN-UP SHEET FOR Middlebury, April 5, 2018 PUBLIC HEARING ON

REQUIRED AGRICULTURAL PRACTICES RULE FOR THE AGRICULTURAL NONPOINT SOURCE POLLUTION CONTROL PROGRAM.

Please PRINT NAME and also indicate your hometown for identification purposes
 Speakers will be called on a first-come, first-served order, using this sign-in roster.

Name	Organization, Town of Residence & Address	Do you farm in Vermont? LFO/MFO/SFO/other / custom applicator	Do you wish to speak today? Yes/No
Amber Brown	Adelstein	Y	Y
Tim Williams	Rutland FSA	N/A	N
Michelle Smith	WACD - S. Lake	NO	NO
Ram Smith	Adelstein County FSA	NO	NO
Colleen Breuninger	RNCB - FARMER 2375 CREEK RD - CLARKSBORO	YES	NO
Steve Martin	Clarendon City	NO	NO
Sarah Janson	NRECS	NO	NO
Gary Spanner	FSA	NO	NO
Gerard Vorsteyer		yes	yes
Bob [unclear]		yes	yes
Dan [unclear]	Barnes VT	yes	no
Bob [unclear]	Adelstein VT	yes	?
Genie Goslinga	" "	yes	?
John [unclear]	Wadbury VT	yes	?
Kirsten Worenman	UVM Extension - Middlebury	no	no

Middlebury Public Hearing 4/5/2018		20 Attendees	
Time	Speaker	Town	Testimony
13:41	Mark Bouven	Addison	Section F. Maintain to promote soil health - problem is that soils are saturated part of the time. These Rules impact the control of runoff, high concentration, high volume water flows are the problem. We need to increase infiltration to decrease erosion and improve soil health. No new surface installation of surface inlets inhibits the ability to manage surface runoff. GW result in gully erosion, perforated pipe is best way to deal with soil health. These rules are written and no one thinks about the consequence. Where is the research that shows this is problem that needs a solution in the first place.
13:44	Gerarld Vorsteveld		Surface inlets when appropriately used can be useful to keep water clean, sending water under the field as opposed to through the field. Time of approval from Sec? How long would this take?
13:47	Bob Clark		Has read tile drain tile from across county, opinions of impact of tile are varied. Would like to see research that is used as basis for this Rulemaking. Bordered by residential properties and golf course, lots of surface runoff from adjacent properties. Worried about ANR testing water from these other properties on his property. Section 12.4(b) - P-Index, why isn't this based on factual evidence on the property? Define why this needs regulation, on top of many other regulations he has to balance in VT. Tile drain impact on his property is spectacular, soil health, yields, ability of property to absorb water. VT should write him check for what he is doing for water quality.
13:51	George Foster	Middlebury	Used System tile for several years, very beneficial for problem fields. No till cropping has also provided even greater benefit, work great together. Any other Rules? Is this the final draft? Will there be time for public comment later on? Timing for decisions from Secretary needs to be pinned down.
13:55	Burt Gosliga	Addison	Has done tiling, has been beneficial. Manure, now tile, what's next? Are you going to involve all parties that bring Phosphorus to the Lake? What can we expect?
13:56	Mark Bouven	Addison	Vent pipes, air into pipes, helps to avoid collapsing pipes.
13:56	George Foster	Middlebury	Manure stacks, I understand about not spreading on tile, what about silage rot?
13:58	Gerarld Vorsteveld		Tile helps keep dirty water out of the lake, in the spring - lots less runoff off the field, a lot less soil erosion. Thinks we should make requirement to tile cropland.
13:59	Mark Bouven	Addison	Corn and soybeans, sell corn to burn. Must take care of surface water to use tile, regulations are a big impediment to fixing drainage on farm. Crops are defficeint in water in July, win win. Less runoff, more nutrients, better chance of decreasing phosphorus. Loss of any phosphorus is loss of money. Need to get rid of high velocity surface runoff, once soil is saturated, can't keep phosphorus out of lake. Need to control water leaving the field. Tile Rules are counterproductive, not helping us control the water.
14:02	Ray Brands		Increases yields, removing more nutrients. Tile is great way to manage water, much better than running off the surface. Works great with cover cropping, CC works best with tile drainage. Regulations are getting ahead of the research.
14:03	Bob Clark		Where Legislative came from, why are we doing this? Would appreciate it the Agency didn't say we're a marketing Agency, not here to defend you again the ANR. Feel like the role of the Agency should be to be an advocate for farmers, instead of being a mechanism of the State. Want to be able to call someone at the Agency and have someone get involved. Taking big steps ahead of the reality on the ground. Slow the process down, seems like there are more benefits to tile than the proposed legislative is treating as negatives.
14:07	Mark Bouven	Addison	Where is the science that justifies these regulations?

Montpelier Public Hearing 4/2/2018			3 Attendees
Time	Speaker	Town	Testimony
17:30	Jacques Couture	Westfield	Has tile on land that was installed in the early 70s (singulare/dendritic, not system pattern tile), am I expected to map these tiles out?

St. Albans Public Hearing 3/30/2018			13 people
Time	Speaker	Town	Testimony
	Bill Rowell	?	Will have to look through the recording to pull out the transcription
	Craig Rainville	Franklin, VT	Question re: Tile and cracking and macropores how is it even possible that this can actually runoff. How can you say that happens? Connectivity and drying and cracing and can stick clip boards through it. Ho
26:20:00	Kent Henderson	Georgia, VT	Who do these rules apply to and non-certified small farms and farmland going out of production. And land being tiled and going back to other land or non-use. Will this reach out to those people to? If someone is reporting to a municipalit that there is runoff from a tile from a field that is not a CSFO / MFO / LFO - who would follow-up on that?
28:50:00	Harold Howrigan	Fairfield	Tile drain has been around as long as I can remember, and this is just another example of focusing just on the dairy farmers in the CV watershed. Every golf course, parking lot and and every building that has been built that has been redone it in this you name it years has perimiter tile or subsurface tile. most of those golf courses who have tile drain are not subject to the scrutitny. Focus is why is this on just the farmers and not anyone else in the watershed. 30 days before and 60 days after implementation is the growing season. Not able to fertilize on that piece of land, fairly subjective, but he thinks that is an overreach. Understand that if put some tile in and put some crop back on it, to prevent erosion, would usuall have to use some sort of nutrient to promote the growth.
32:00:00			Pretty much everone is doing it.
	Mike Howrigan	Fletcher	Do you want metal rodent guards so you can find them? 7th generation vermonter; Fletcher since 1876. sustainabilit and conservation has been key to the survival of our farm for the past generations, not just the past few years. Dairy farmers have endrued and adapted to many price swings and changing regulations over the generations; been involved in producing quality milk. we have an ag agency employee, that this 4 year down cycle is driving farms out of business. it used to be that during hard times, agency and the legislature would find solutions, now trying to drive folks and people from the land. Dairy industry is an economic engine for Vermont, too bad that they wouldn't respect and cherish the dairy industry before it is too late, maybe a change in personel at the agncy and respect and allow people to work together on these issues.
39:00:00	Jaques Parent		Benefits of tile drainage are unmesearable; one of the first people to do that in franklin county, system tile drainage. Can see the benefits of tile drainage. Suggest that before throwing too many more regulations that all the young staff here, that the staff with the Ag department should put them to work to benefit ag tile.

	Steve Martin	Soleno	<p>Tile industry in NY continues to expand and it gives a major economic advantage to dairy farmers in NY, PA, MA. VT is the only state in North East and addressing it this way, but looking at this on economic impact, soil erosion, P reductions from better field and getting better management practices, less erosion, plowing earlier, getting crops off earlier. better windows for manure management. if you take that away from dairy farmers you are actually adding to it. you are not looking at the impact of what the dairy industry, not looking at the total impact or overall land. AAFM is not showing the public the entire picture of Tile Drain. Some would say spend money on tile, brings in less feed into VT, lots of folks with insurance programs that we're doing payouts. could use that money to help with pollution control. storm events that are happening and rainfall and record fall, happening in greater records, instead of 1/2 an inch getting 3 inch; taking away our ability to manage soils, if take soil institute, take away a great deal and a lot of slides and how the climate has changed over 25 years. not sure where we're going to be in the next 25, but i feel that we're not looking at all the impact and we're not getting the right message out there.</p>
45:00:00	Bill Rowell		<p>Difficult to work for AAFM, difficult to work as a farmers. Have to watch the legislature, spend a lot of time in MPL, spent 21 days in last session. This year, not so much, going to see some things that don't make any sense. Thing I find disappointing and listen to Eric Young and his 6 year study funded by USDA and look at his findings, shows that the majority of the P by far comes from surface runoff and not tile drainage. why are we so narrowly focused on TD for P, doesn't make a lot of sense to me. Studied this stuff in graduate school, and for the average person, i don't know how they make sense of it, i have a hard time looking at it and making sense of it at times. I don't think. Sen. Finance, they were so concerned that the farmers were running willy nilly putting tile in the ground. Where did they get their money from? Where did they get the money to put an inordinate amount of tile in the ground. Several wanted to know why, and why you need tile and while you have people like that making the rule, you have some problems. The process isn't well enough attuned to what the audience is working for and does not work for everyone.</p>
49:50:00	Kent Henderson		<p>Part of working tile study group and just from historical perspective, 2016 was the first meeting of that group, three environmental groups on that group. These questions around moratorium and bans and tile drains was brought up tile installers on that group, producers, outstanding UVM extension staff and worked and came up with solid recommendations that these are not appropriate discussions to be having about shutting it down. 2017. only environmental group at that meeting. the other two had created legislation contrary to shut down tile drainage. took information out of study group to promote, and those there a year ago of CLF at that meeting and picked out specific parts of the conversation, left out the constructive criticism, give credit to the 2017 group and focused in on the issues that those installing tile drains and focusing on what they're installing, that's a fireable offense if no one goes out and puts it in, and everyone knows they're not going back the next day. Stand up pipes that's a practice they're going away from. took those meetings and put those better practices towards tile drainage. constructive criticism to move ahead, we all know and we all realize the benefits of farmland that has been tilled that compliments covercrop and compliments no-till, essential for managing the soils we deal with. throw in a historic perspective on this. way of pointing of stronger and better management practices. better than getting to destructive control promoted by others.</p>
	Ken Bassett		<p>Not a farmer, but have a lot respect for farmers. Never been to a hearing about tiling and see it all over the place. See it from the stacks of tile when the machine buries and covers it up. Real dries up the corn fields, everything seems kind of growing good. what do we see. we see the tiles arrive, put in the ground, covered up, see the standpipe next to the road, and in the space of a day, we see the hardtop cut out and culver put in and the road cut out and dug up and paved. ditch is dug all around the edge of the field, nothing that he was used to growing up on different fields. the ditch has a new culver, it is covered over, paved by 4PM. no different than every other day, high water comes in and goes to the other side of the road; and you can see through the woods the main lake, can see it is less than 100 yards, and lake hasn't come up for normal spring level. but it seems that the dissonance between putting drain tile in and the distance to the lake, and see that there is nothing bad going to the lake. but to the people living there it seems very suspicious. have a lot of respect for people that are trying to make a living being a farmer. neighbors, he's here because he's curious. but that's what we see.</p> <p>Development and settling ponds, this is what i see, i am concerned about the distance from the end of the drain tile and where they all collect and the distance is short and there is a fresh culvert in between.</p>

christmas trees, grapes, tree fruit, hops and vegetables.

The minimum of tiled land was 1/2 acre and the largest amount over 500 acres.

Half the respondents were not row crop or hay farmers.

I think this shows how important tile is to many farmers not just dairy.



(Notes prepared by Heather Darby)



- Items listed in d)-Already stated in lines a, b, and c.. unnecessary
- e)-this really focuses on land flow and the document in question pertains to tile drainage, this should be taken out
- f)-Already part of NMP T. RUSLE2 calculations not to do with tile
- g) Custom installers had challenges with the wait time but perhaps it could be adjusted to fit our growing seasons and land work seasons

*Submitted
By Bill Rawell*

In addition: UVM Ext Data show that on 843 points which includes 22 farms and 65 outlets in Franklin/Grand Isle County-90% of samples had lower than average dissolved Phosphorus in receiving rivers. NO flow data was collected but overall tile loads are low compared to stream loads

Ongoing survey effort not completed yet..

Recent UVM EXT survey of 120 farmers data 75% tree, fruit, vegetable, crops, dairy and livestock; that have installed tile have experienced yield increases between 21-100%. 90% stated indicated that tile has improved their ability to incorporate conservation practices

78% indicated that they are more accurately implement their NMP

89% indicated that they re better able to plant cover crops and implement rotations

Farmers that answered the survey ranged in agricultural acreage from 3 acres to 4000 acres

Respondents included farms that have tile in field crops or hay, perennial corps like

*From
Laura → confirm with Heather Darby*

April 17 2018

To Whom it may concern

This subsurface tile drainage amendment is stupid and not necessary. It's a fact that more nutrients run off land than drain down and out by tile.

Dr. David Merchant at Iowa Institute and Dr. Eric Young did years of studies on run off and found by using tile the water quality was far better. Please consult with them at IIA before you make more stupid rules that put farmers out of business. We all want clean water but this tile rule will make a lot of land unusable.

Please do not add any rules to tile draining our fields.

Thank you
Edward Robinson
Robinson Ranch

Optional Public Comment Form

In re: Proposed Required Agricultural Practices Rule for the Agricultural Nonpoint Source Pollution Control Program.
Public Comment Deadline: April 19, 2016



I think section 12.49 should be eliminated entirely as all other RAP's remain in effect on the nutrient application for all land regardless of land tile installation dates.

Harold Hawregan

Continue on Reverse

Submit Form by April 19, 2018 to:

Vermont Agency of Agriculture
Attn: RAPs
116 State Street
Montpelier, VT 05620

Name		
Address		
City	State	Zip
Optional E-mail Address		

For more information, please visit <http://agriculture.vermont.gov/rap-tile-rule> or contact the Vermont Agency of Agriculture, Food and Markets (VAAFMM) at (802) 828-2431
Public comment on the RAP Proposed Rule can also be submitted to AGR.RAP@vermont.gov



**CERTIFIED
CROP ADVISER**

Subsurface Tile Drainage
RAP Rule Amendment
Water Quality Division
Vermont Agency of Agriculture Food and Markets
116 State Street
Montpelier, Vt. 05620

Paul C Stanley
Crop Management Services

864 Lawyer Road
East Fairfield, Vt. 05448
(802) 827-6145
paullin4@myfairpoint.net

To whom it may concern:

Please accept this written testimony in reference to the Tile Drainage rules proposed for the Required Agricultural Practices.

Working as a Certified Crop Advisor in Chittenden and Franklin County Vermont along with attending many meetings at Miner Institute and in the Lake Carmi Watershed from the onset of tile drainage and its impact on water quality has provided much insight.

In reviewing the "Annotated Text of proposed RAP rule revision for subsurface Tile drainage" document, the ruling looks to be very much on target to meeting the research findings on how to reduce Phosphorus loss from crop land to State Waters. The rules stated in this document are in line with the philosophy that "Tile Drainage is not the problem, it is what's going on over it that is the problem".

In section 12.4, would like to see this state: any land subject to the Required Agricultural Practices that has tile drainage is required to have a nutrient management plan to the 590 standard. This would then include any tile drainage used in house foundations, lawns, parking areas that contribute as storm run off. A permitting process could be implemented that would require an approved permit explaining its use before a retailer could make a sale on tile drainage.

Agriculture and water quality are very important to the State of Vermont and tile drainage is a very useful tool for production agriculture and does not have a negative impact on water quality when used according to the proposed law in section 12 of the Required Agricultural Practices.

Let's move this forward, leave the Required Agricultural Practices as is and begin implementation and enforcement.


Paul C Stanley

From: Jared Carpenter
To: [DiPietro, Laura](#)
Cc: [AGR - RAP](#)
Subject: Comments on Proposed RAP Rule Revision for Subsurface Tile Drainage
Date: Thursday, April 19, 2018 2:27:44 PM
Attachments: [2018-04-19 LCC VNRC et al Comments on Proposed Tile Regulations.pdf](#)

Good Afternoon, Laura,

Attached, please find comments by the Lake Champlain Committee, the Vermont Natural Resources Council, the Vermont Conservation Voters and the Vermont Chapter of the Sierra Club on the Proposed RAP Rule Revision for Subsurface Tile Drainage.

Thank you for the opportunity to comment. If you have any questions, please do not hesitate to contact me.

Thank you.

Jared Carpenter, Water Protection Advocate

Lake Champlain Committee

Working for a healthy, accessible lake since 1963

208 Flynn Avenue, Building 3, Studio 3F
Burlington, VT 05401

[\(802\) 356-3666](#) (cell phone)

[Email/Web/Facebook](#)



April 19, 2018

Secretary Anson Tebbetts
Agency of Agriculture, Food & Markets
116 State Street
Montpelier, VT 05602

Dear Secretary Tebbetts,

The Lake Champlain Committee, the Vermont Natural Resources Council, Vermont Conservation Voters, and the Vermont Chapter of the Sierra Club thank you for the opportunity to comment on the Proposed RAP Rule Revision for Subsurface Tile Drainage. While we have differences on the approach to regulating subsurface tile drains and their discharge, we appreciate that the Agency of Agriculture, Food & Markets (AAFM) has undertaken the process.

General Comments

Overall, we ask that AAFM strengthen and clarify these regulations before the final rule is issued. The regulation of the discharge from subsurface tile drains is just a portion of the overall effort to curb phosphorus pollution and sedimentation. In order to benefit water quality in Vermont, all sources of phosphorus discharge must be addressed, from wastewater and stormwater to forestry and agriculture.

Strong subsurface tile drain regulations are necessary in order for agricultural pollution to be properly addressed. AAFM has consistently made known their position that the impact of tile drains is still being studied, and the amount of phosphorus and sedimentation from a particular tile drain is based on a number of factors, particularly installation and soil type. This is understood, but subsurface tile drains are still a significant source of phosphorus pollution and sedimentation that must be regulated.

Under their TMDLs, overall phosphorus loading to Lake Champlain must be reduced by 34% and to Lake Memphremagog by 23%. However, cyanobacteria blooms have been seen in other

Vermont lakes. Lake Carmi is an example of a smaller water system that has been significantly degraded by phosphorus pollution. To protect high quality waters and restore degraded waterways, phosphorus pollution from both surface and subsurface agricultural sources must be addressed.

The above groups ask that manure application and stacking take into account the location of subsurface tile drains; that all tiles, both pattern and individual, be specifically mapped and subject to monitoring; and, that the regulation be reviewed and amended in five years to adjust for current research and to implement the best management practices that this research indicates.

Specific Comments

Section 12.1 Definition

The definition of “subsurface tile drain” appears broad enough to include all individual and pattern conduits that are used to drain surface or subsurface waters from a farm field. As the definition of “cropland” set in the Required Agricultural Practices (RAPS) is itself broad, the expansiveness of this definition seems to also apply to that of subsurface tile drains. We ask that AAFM please confirm that the definition includes all individual and pattern conduits used to drain surface or subsurface waters. If it does not, we ask for an expansive, all-inclusive definition.

Section 12.2 Requirements for Subsurface Tile Drainage

The proposed regulation bans field-stacking manure within 100 feet of a subsurface tile and does not allow new vegetative treatment areas within 200 feet upslope and new tiles installed within 200 feet of existing vegetative areas. We wholly support the premise of this section. In order to eliminate impacts from runoff, manure should not be stored near tiles, as they act as a conduit of waters and pollution. Therefore, it is logical that these mirror the RAPS, under which manure cannot be stacked adjacent to surface waters. However, the proposed regulation should be clearer. Please include the definition of “vegetative treatment areas” within §12. For simplicity and clarity, please adjust the regulation to read, ‘no field stacking manure and no new or existing vegetative treatment areas within 200 feet of any subsurface tile drain.’

Section 12.3 Requirements for Surface Inlets

We agree with the proposal to ban new surface inlets. To the extent practicable, please include a definition of “surface inlets,” to avoid confusion between those used in agricultural practices and those used for other purposes. As surface inlets are a direct conduit from the surface to a stream or ditch, a minimum 25-foot buffer should be required, similar to the RAPS requirement for buffers adjacent to surface waters. Further, a requirement should be added that surface inlets be closed immediately prior to and for a specified time after manure and fertilizer application to allow for absorption.

Section 12.4 Pattern Tile Drainage

This section appears to bring subsurface tile drains under the purview of Nutrient Management Plans (NMPs). Large Farm Operations (LFOs), Medium Farm Operations (MFOs), and now Certified Small Farm Operations (SFOs) all have to manage the application of manure and fertilizer based on the requirements of the Natural Resources Conservation Service (NRCS) Nutrient Management Practice Code and must base manure and fertilizer application on their P-Index. While this proposed regulation may alter some of the current NMP requirements, there appears to be little change from current regulations.

The proposed regulation requires that LFOs, MFOs, and SFOs “identify cropland with pattern tile drainage systems.” Our interpretation is that, under the proposed regulation, a farm must basically answer a ‘yes / no’ question as to whether pattern tile drains exist in a particular field, but not acknowledge the extent of the tiles or identify the specific location of the tiles and their discharge / outflow points. Further, the regulation only includes pattern tiles from these types of farms. Instead, all subsurface tile drains, whether pattern or one individual tile used to drain a specific low point of a field, must be mapped in order to properly identify all of the potential outflows of phosphorus pollution and sedimentation.

The NMP provides a ready vehicle to include this information and, as they are updated annually, the agency can identify the location and extent of subsurface tile drains with specificity. We understand that the agency is concerned that a farmer may not know the location of all tiles, particularly older tile drains. But, in all likelihood, a farmer knows the fields well enough to identify the vast majority of the tile locations and outflow points. Phosphorus pollution and sedimentation cannot be properly addressed and curbed if the locations of the points of pollution are not identified. We ask that the specific locations and the outflow points of all subsurface tile drains, both pattern and individual, be mapped and reported.

Request that §12 Be Amended in 2022 to Include Results of Current Studies

It is our understanding that three studies are under way as a result of monitoring different tile drain outflows. Once the current research is completed, it should be used to update this section to include improved best management practices, techniques and new treatment technology. Even if this is currently the intent of the agency, a date certain should be added to ensure this occurs.

Language should be added to the proposed regulation similar to that in §1.6. Current law reads: “Further considerations under the RAPs: 6 V.S.A. § 4810a(b) requires that on or before January 15, 2018, the Secretary of Agriculture, Food and Markets shall amend by rule the Required Agricultural Practices in order to include requirements for reducing nutrient contribution to waters of the State from subsurface tile drainage. As part of the rule amendment process, the Secretary may also evaluate the current status of effectiveness of the Required Agricultural Practices, the implementation of additional best management practices, and the current water quality condition of waters of the State. The Secretary may consider additional changes to the Required Agricultural Practices, as appropriate, to meet the water quality goals of the State.”

Aligned in intent and spirit of the language in §1.6, similar language should be added to §12: ‘On or before January 1, 2022, the Secretary shall evaluate the current status of effectiveness §12 of the Required Agricultural Practices, and will amend §12 of the RAPs to include the results of any subsurface tile drain studies, including any new Best Management Practices and findings.’ It is important that the regulation reflect the results of this research and that agricultural practices utilize any forthcoming Best Management Practices as they are developed.

Conclusion

The under-signed organizations appreciate AAFM’s efforts to draft the proposed regulation for subsurface tile drains. However, the regulation must be stronger if it is to properly address the totality of the surface and subsurface discharge and runoff of phosphorus and sedimentation.

Sincerely,



Jon Groveman
Policy and Water Program Director
Vermont Natural Resources Council



Lori Fisher
Executive Director
Lake Champlain Committee



Mark Nelson
Executive Committee Member
Vermont Chapter of the Sierra Club



Lauren Hierl
Political Director
Vermont Conservation Voters

From: [Patch, Ryan](#)
To: [AGR - RAP](#)
Subject: FW: CLF comments on draft tile rule
Date: Tuesday, April 17, 2018 9:29:04 AM
Attachments: [CLF Comments on Draft Tile Rule.pdf](#)

From: Rebekah Weber <rweber@clf.org>
Sent: Monday, April 16, 2018 11:27 AM
To: Patch, Ryan <Ryan.Patch@vermont.gov>
Subject: CLF comments on draft tile rule

Hi Ryan,

Please find CLF's comments attached.

Thank you,
Rebekah

Rebekah Weber
Lake Champlain Lakekeeper
Conservation Law Foundation

15 East State Street, Suite 4
Montpelier, VT 05602-3010

P: 802-223-5992 x 4012

C: 510-325-9831
E: rweber@clf.org

id:image001.jpg@01D1493D.78D85050



April 16, 2018

Ryan Patch
Senior Agriculture Development Coordinator
Vermont Agency of Agriculture, Food, and Markets
116 State Street
Montpelier, VT 05620

Sent via email: ryan.patch@vermont.gov

Re: CLF Comments on the Proposed RAP Rule Revision for Subsurface Tile Drainage

Dear Ryan,

Conservation Law Foundation (“CLF”) appreciates the opportunity to comment on the Proposed RAP Rule Revision for Subsurface Tile Drainage (“Draft Tile Rule”). While CLF acknowledges the Agency of Agriculture, Food, and Markets’ (“AAFM”) effort in crafting the Draft Tile Rule, we remain concerned the rule is insufficient to address the negative impacts of tile drains.

Negative Impacts of Tile Drains

1. Tile Drains Contribute Phosphorus Pollution to Lake Champlain

Scientific literature clearly documents phosphorus in tile drainflow. One modeling study in St. Albans Bay estimated that 13 percent of the agricultural phosphorus load could be the result of tiles. Additional research suggests tiles can contribute as much as 40 to 80 percent of the annual phosphorus load in agricultural watersheds.¹ A literature review concluded that high phosphorus concentrations in tile drainflow have been observed in the Lake Champlain Basin,² and that tile drainflow is a significant source of phosphorus at the watershed scale.³

The State has reaffirmed the need to address phosphorus pollution from tile drains. Act 64 directs the Secretary of AAFM to reduce the nutrient contribution from tile drains to waters of the State. 6 V.S.A. §4810a(b). In the Phase I Implementation Plan for the Lake Champlain Total Maximum Daily Load (“TMDL”), the State found “drainage from tile can contain high nutrient levels, especially dissolved phosphorus.”⁴

¹ Stone Environmental, Literature Review: Tile Drainage and Phosphorus Losses from Agricultural Land (November 2016), pg. 5.

² *Id.* at 3.

³ *Id.* at 5.

⁴ Vermont Lake Champlain Phosphorus TMDL Phase 1 Implementation Plan (September 15, 2016), pg. 100.

The backdrop to the discussion of phosphorus pollution is the requirement by the Environmental Protection Agency (“EPA”) to reduce the phosphorus load to Lake Champlain from the agriculture sector by 54 percent. In Missisquoi Bay this mandate surges to 83 percent and in South Lake A and B to 63 percent.⁵ It is CLF’s understanding that such tremendous reductions are unprecedented nationwide, and demand controls on every conduit of phosphorus pollution to the lake.

2. Tile Drain Effluent is Acutely Toxic to Aquatic Insects and Aquatic Plants

Tile drains are a direct input of nutrients and pesticides into Vermont streams. According to testimony provided by Nat Shambaugh, a retired chemist from AAFM, to the Senate Agriculture Committee on March 1, 2018, there are a number of toxic chemicals found in tile outflow, including neonicotinoids, atrazine, and nitrates. Two of the neonicotinoids (clothianidin and imidacloprid) in tile drain effluent are above EPA levels of concern for aquatic life.

Recommendations to Improve the Draft Tile Rule

1. Require Inventory and Map of Known Tiled Fields and Tile Exits

An inventory and map of known tiled fields and tile exits is an important step in a broader investigation of chemical export via tile drains. The Draft Tile Rule requires the identification of cropland with pattern tile drainage systems. It is unclear what “identification” means. AAFM should clarify that LFOs, MFOs, and CSFOs are required to submit a map of all known tiles and tile exits as well as any proposed tiles prior to installation. It is impossible to understand the impacts of tile effluent on water quality without knowing the location of tiles.

2. Require Tile Effluent Monitoring of Agrochemicals, Including Pesticides, Phosphorus, and Nitrogen

Monitoring tile effluent is critical to understanding the impacts of tiles on water quality. The Draft Tile Rule is silent on monitoring. While it is CLF’s understanding that some tile effluent monitoring is underway, we strongly encourage AAFM to build the monitoring program into the Draft Tile Rule to create a transparent and publicly accessible process. In addition, CLF is extremely concerned with monitoring agrochemicals beyond phosphorus, including pesticides and nitrogen. It is unclear how AAFM is addressing the testimony provided by Nat Shambaugh, including the presence of neonicotinoids, nitrates, atrazine, and phosphorus in tile drainflow.

3. Develop a Permit Process for the Installation of New Tile Drains

Currently, the State has limited data on tile drains. This is problematic given the known negative impacts of subsurface tile drains, including the contribution of phosphorus, pesticides, and nitrogen to waters of the State. A permit program is a beneficial tool to evaluate and quantify the extent of tiles being installed, create structure and consistency for tile installation, and allow for the State to adapt as research provides further information about best practices for tile depth, spacing, and location. A certification program for tile

⁵ Phosphorus TMDLs for Vermont Segments of Lake Champlain (June 17, 2016) pg. 45, tbl. 8.

installers would complement a permit program and allow for a required education component that can increase understanding of current and future best practices. At a minimum, AAFM should commit to reevaluating the sufficiency of the Required Agricultural Practices, including the tile drain provision, every five years.

4. Require Adequate Nutrient Management Planning and Implementation Prior to Tile Installation

Farmers installing tile should be in compliance with the Required Agricultural Practices and should submit a current Nutrient Management Plan to AAFM. Tile drain management requires a commitment to clean water regulations and understanding of potential water quality impacts. Therefore, only farmers in good standing with AAFM and have no violations within the past two years should be permitted to install new tile drains.

Thank you for the opportunity to provide feedback on the Draft Tile Rule. CLF urges AAFM to incorporate and address our comments.

Sincerely,



Rebekah Weber
Lake Champlain Lakekeeper
Conservation Law Foundation

From: [AGR - WaterQuality](#)
To: [AGR - RAP](#)
Subject: FW: VDPA Testimony on Tile Drainage
Date: Thursday, April 19, 2018 1:07:59 PM
Attachments: [VDPA Testimony for Tile Drainage 2018.pdf](#)
Importance: High

From: Cheri L'Esperance <cheri@wsavt.com>
Sent: Thursday, April 19, 2018 1:04 PM
To: AGR - WaterQuality <AGR.WaterQuality@vermont.gov>
Cc: Heather Shouldice <heather@wsavt.com>
Subject: VDPA Testimony on Tile Drainage
Importance: High

Please see attached testimony on behalf of the Vermont Dairy Producers Alliance.

Thank you.

Cheri L. L'Esperance

William Shouldice & Associates LLC
35 Court Street
Montpelier, VT 05601
802.839.0006 cell / 802.223.1197 office

April 19, 2018

TO: Vermont Agency of Agriculture, Food and Markets

FROM: Vermont Dairy Producers Alliance

RE: Testimony for Tile Drainage

To Whom It May Concern:

We would like to submit the following testimony on the Tile Drainage Report submitted by the Vermont Agency of Agriculture, Food and Markets for consideration.

Pertaining to Section 12.4 Requirements for Subsurface Pattern Tile Drainage, we respectfully suggest:

(d) as already been covered in a, b, and c and therefore is unnecessary.

(e) does not deal with “tile drainage” but instead on land flow and this report is focused on tile drainage. Therefore, this item should be cut from the final report.

(f) This is already part of NMP T. RUSLE2 calculations and does not have to do with tile drainage

(g) Custom installers had challenges with the wait time but perhaps it could be adjusted to fit our growing seasons and land work seasons

We would recommend that the Vermont Agency of Agriculture, Food and Markets review the recent UVM Extension survey on the use and importance of tile drainage to Vermont Agriculture. This survey gathers the importance of all variety of farms and sizes and recognizes the diversity that exists. Tile drainage is extremely important to proven soil practices and efforts to improve water quality when managed properly. The Vermont Dairy Producers Alliance supports the education and guidance of implementation and maintenance of systematic tile drainage.

In addition, more research needs to be done prior to any changes being made in reporting of tile and mandates for those that use tile drainage. It is imperative to let the academic research be completed and compiled. We understand that UVM Extension and Minor Institute are both conducting studies and need more time before any conclusions or results can be released.

Respectfully submitted,

Amanda St Pierre
Executive Director

From: Marilyn Lagrow
To: [AGR - RAP](#)
Cc: ["Marilyn Lagrow"](#)
Subject: Public Comment on Proposed RAP Rule for Subsurface Tile Drainage
Date: Sunday, April 8, 2018 12:27:32 PM

I am here by submitting the following Public Comment on the "Proposed RAP Rule for Subsurface Tile Drainage".

The purpose of this comment is to argue that any runoff from a Subsurface Tile Drainage System from an actively farmed field should not be discharged directly into a lake, pond, river or other waterway in Vermont without first being filtered through an appropriate wetland, retention pond or other means of filtration used to remove nutrient pollutants, thus preventing increased pollution of Vermont waters.

The following points are made as a part of this Public Comment:

- Run-off from active farm fields is the major source of nutrient pollution in Vermont lakes, ponds and waterways.
- Fields which are actively farmed and have sub-surface tile drainage systems are currently allowed to discharge run-off from the tile system directly into lakes, ponds and waterways without any filtering or other attempt to remove nutrient load prior to discharge.
- No testing or monitoring of this discharge is done or required
- A requirement that discharged from sub-surface tile drainage systems must pass through a wetland filter or alternative filtering system would reduce the amount of nutrient pollution which is discharged to Vermont waters.
- Vermont waters are in crisis due to excessive nutrient load which has accumulated over decades from Agricultural sources. It is far, far more difficult and expensive (if not impossible) to remediate these waters than it is to prevent these pollutants from entering the waterways in the first place
- No remediation efforts can be effective if the source of the pollution is not controlled first. As long as significant run-off from agricultural activities is allowed to continue the crisis will only get worse

EXAMPLES OF SUB-SURFACE TILE DRAINAGE SYSTEM BEING DISCHARGED DIRECTLY INTO WATERWAY:

- 1) A 55 Acre corn field on the west side of US Route 2 in North Hero was tiled 2 years ago. The subsurface tiles were all directed to 2 perimeter drain sub-surface tiles. These 2 perimeter drains discharge directly (via culvert) into Lake Champlain. There is no filtering, no retention pond, no attempt to remove nutrient pollution from the discharge before it flows unimpeded into the Lake. Several State agencies were notified about the situation, only two responded and no action was taken. One response was, "if he (the farmer) did it, he won't do it again". ?? The other state official seemed to believe that the discharge was being filtered by "the drainage ditch", however, water running through a pipe is not filtered at all (whether or not the pipe resides in a ditch). To my knowledge, no testing or monitoring was done.
- 2) A second example is a 100+ acre corn field which was tiled last year. It discharges directly into the Mill River in Georgia. Again with no filtering or attempt to reduce nutrient pollution.

These are just two examples of which I happen to be personally aware. There must be dozens or hundreds of others around the state.

I strongly suggest that the State implement and enforce rules requiring new AND existing sub-surface tile drainage systems to discharge run-off to some effective filtering system before runoff from the system is allowed to enter Vermont waterways. I also suggest that discharge from these systems be monitored to determine the amount of nutrient pollution that is exiting the system and entering Vermont waters. The expense of this monitoring and enforcement will be far less than the cost of trying to get the nutrients back out of the Lake.

Submitted by:

Marilyn B. Lagrow

351 Clover Lane

North Hero, VT 05474

(802) 372-3231

From: Deb Hartenstein
To: [AGR - RAP](#)
Subject: RAP rule amendment of subsurface tile drainage
Date: Monday, April 2, 2018 4:35:27 PM

As a full time resident of the town of Panton,VT, we have noted the serious decline in water quality along our property on Lake Champlain. For the past few years swimming and boating have been totally uninviting due to algae blooms, debris, turbidity, color and visible particulate farm byproducts.

In our very near vicinity is a very large dairy farm that has been in the news of late and it continues to expand crop areas, place tiling and remove both shade and valuable buffering trees along the property.

The tiling that was installed is directed to the culverts which drain into the lake . Water run off and phosphorus, farm nutrients and debris is of continuous flow.

The proposed RAP amendment is essential and should be even stricter than proposed. Placing buffer zones , getting farms off the lake and away from critical drinking water sources are only a few of the needed changes.

The Lake Shore Protection Act is essential for all involved not just residential properties. To continue to have Agriculture exempt from these standards as well exemption from pollutants and junk ordinances is criminal and needs to stop immediately.

We are ALL consumers of air, water, earth and space so adherence to improved and technologically advanced standards that would eliminate nutrient run off into our most precious asset , Lake Champlain, needs to occur NOW. We drink the water! Property values continue to decline due to this let alone the impact on tourism and recreation.

I believe that any reasonable citizen understands the problem and can distill the issues simply and quickly. Change is essential. We tax payers continue to change so it is time for agriculture to step up and remove the archaic and old fashioned rules and regulations that are impacting us all.

I or any of my direct neighbors would be glad to show you what I am referring to with the tiling tubes directed into culverts draining to the lake.

Thank you

Deb and Bob Hartenstein
Panton, VT

From: [Patch, Ryan](#)
To: [Health Hero Farm](#)
Cc: [AGR - RAP](#)
Subject: RE: presentation slides
Date: Wednesday, March 14, 2018 5:19:15 PM
Attachments: [image002.png](#)

Hi Joan,

Thank you for your comment on the RAP proposed rule amendment for tile drainage.

I have forwarded your comment to the AGR.RAP e-mail address and your comment will be considered and responded to after the public comment period closes on April 19, 2018.

Thanks again,
Ryan

Ryan Patch
Sr. Ag Development Coordinator
Vermont Agency of Agriculture, Food and Markets
116 State St. Montpelier, VT 05620
Cell: (802) 272-0323
Fax: (802) 282-1410
ryan.patch@vermont.gov
<http://agriculture.vermont.gov/>

Find us on social media:   

Click [HERE](#) to sign up for our Agriview e-Newspaper

From: Health Hero Farm <healthheroislandfarm@gmail.com>
Sent: Friday, March 9, 2018 5:50 PM
To: Patch, Ryan <Ryan.Patch@vermont.gov>
Subject: Re: presentation slides

Ryan,

Please consider, in the new requirements for tiling, to exempt legacy tiling that no longer functions. Is there realistically any cost-effective improvement that should be done with such systems?

For tiling installed decades ago and several owners ago, the current owner usually has no idea how much is installed, what the system pattern is, and where the outlets can be found.

It is burdensome to farmers to deal with legal requirements that make no sense on their farms and that the state probably won't enforce. Everyone would be better served if the scope of the legislation was narrowed to just those systems that should be improved.

Joan Falcao

On Thu, Mar 8, 2018 at 9:32 AM, Health Hero Farm <healthheroislandfarm@gmail.com> wrote:

Hello Mr. Patch

Thank you for your presentation yesterday at Champlain Valley Equipment in St. Albans.

At your earliest convenience, please e-mail me a copy of your presentation slides

Thanks again!

- Bob Fireovid

--

Health Hero Farm

(physical address:) 350 West Shore Road

(mailing address:) 122 Station Road

South Hero, Vermont 05486

[\(802\) 378-5246](tel:8023785246)

<http://www.healthherofarm.com>

--

Health Hero Farm

(physical address:) 350 West Shore Road

(mailing address:) 122 Station Road

South Hero, Vermont 05486

(802) 378-5246

<http://www.healthherofarm.com>

From: Stefanek, Pam - NRCS-CD, Middlebury, VT
To: [AGR - RAP](#)
Subject: Subsurface Tile Drainage RAP Rule Amendment
Date: Thursday, April 26, 2018 5:01:22 PM

I support the Tile Drain process.

Pamela

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From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 4:18:28 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Require testing of discharge from tile drainage systems that drain directly in lakes, rivers, streams and ponds.
5. Require mitigation/filtering of tile drainage systems (new and pre-existing) that are found to be discharging pesticides, phosphorous and/or nitrogen into Vermont waterways.
6. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in. It is far less expensive to keep it out than it is to remove it once it has been allowed to enter a lake or waterway.

Sincerely,
Marilyn Lagrow
351 Clover Lane
North Hero, VT 05474
mlagrow7@gmail.com

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Marilyn Lagrow
351 Clover Ln
North Hero, VT 05474-9405
(802) 372-3231
mlagrow7@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 23, 2018 11:19:18 PM

Apr 23, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mrs. Sarah Lincoln
556 Quaker St
North Ferrisburgh, VT 05473-7016
(802) 735-7987
slincoln556@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Thursday, April 19, 2018 7:25:48 PM

Apr 19, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Kate Kenner
3539 Weatherhead Hollow Rd
Guilford, VT 05301-8395
(802) 251-7402
faunesiegel@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Thursday, April 19, 2018 12:55:00 PM

Apr 19, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Victoria Conti
15 Spring Hollow Ln
Barre, VT 05641-5124
(802) 479-2876
jesariconti@aol.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Wednesday, April 18, 2018 7:59:55 PM

Apr 18, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Melissa Wales
PO Box 172
Saxtons River, VT 05154-0172
(413) 222-9554
zeta369@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Tuesday, April 17, 2018 9:51:56 PM

Apr 17, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Bonnie Hearthstone
8 Country Cmns
Vergennes, VT 05491-8606
(802) 877-6594
bhearths@middlebury.edu

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Tuesday, April 17, 2018 11:25:08 AM

Apr 17, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. David Felcan
164 Lyman Ave
Burlington, VT 05401-5022
(802) 860-9587
dfelcan@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Tuesday, April 17, 2018 10:20:30 AM

Apr 17, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Dan Dudensing
11 Elm St
Waterbury, VT 05676-1861
(781) 500-9920
imdano@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 9:18:54 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Peter Souza
538 S Stream Rd
Bennington, VT 05201-8992
nyb
eastgsdvt@yahoo.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 7:48:50 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Dr. Jean Ceglowski
PO Box 38
Rupert, VT 05768-0038
(802) 394-2962
rupvet@myfairpoint.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 5:18:32 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Gregory Rouse
871 Cady Hill Rd
Cambridge, VT 05444-9860
(802) 644-5907
g1rouse@yahoo.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 3:48:26 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Linda Satter
198 Bonnet St
Manchester Center, VT 05255-8900
(555) 555-5555
lndashome@comcast.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 3:23:11 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Robert New
2 Teenies Tiny Rd
Rutland, VT 05701-9820
(802) 775-9322
jwusjp@comcast.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 2:18:16 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. GLYNDA MCKINNON
5261 Lake Rd
Charlotte, VT 05445-8906
(802) 355-0015
glyndam3@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 2:18:15 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mrs. Violet B. Gautesen Krukonis
6 Rosewood Ln
Essex Junction, VT 05452-3780
(802) 878-3439
vbkrukonis@hotmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 2:18:15 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. A Eckles
PO Box 443
Middlebury, VT 05753-0443
(802) 310-9364
aleckles@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 1:48:07 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Charles Parent
PO Box 422
Hinesburg, VT 05461-0422
(802) 482-4772
cparent@gmavt.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 1:48:05 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mrs. Kristine Winnicki
257 Goat Farm Rd
Chester, VT 05143-8518
(802) 875-3115
kwinnicki@hotmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 12:47:58 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. KARL NOVAK
95 Red Truck Ln
Hinesburg, VT 05461-4440
(802) 482-6656
kavon95@gmavt.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 12:47:58 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

Please, be vigilant on stopping the lake pollution once and for all. Farms are responsible for a large percentage of the pollution and we need to recognize that for real, finally, and put an end to it.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Judy Kowalczyk
219 Blake Roy Rd
Middlebury, VT 05753-8654
(802) 388-3390
jsk@gmelectro.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 12:47:58 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Charles Murphy
PO Box 1093
Manchester, VT 05254-1093
(802) 366-8111
chic7@comcast.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 12:22:49 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Katherine Werner
354 Hastings Rd
Waitsfield, VT 05673-7117
(802) 496-3271
kwerner@gmavt.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 12:17:53 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike, is hammering Vermont's tourism economy and negatively affecting people's home prices and quality of life.

Including the following four recommendations will improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile drain effluent monitoring of pesticides, pharmaceuticals, phosphorus, and nitrogen.
3. Develop a permit system for the installation of new tile drains.
4. Revisit the required agricultural practices in two years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Kai Forlie
27 Germain St
Burlington, VT 05401-1618
(000) 000-0000
kaimikkelforlie@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 12:17:53 PM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Patricia Vincent
PO Box 87
Roxbury, VT 05669-0087
(802) 485-7102
patriciavincent@tds.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:52:47 AM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Ms. Phyllis Erwin
1012 Broad Brook Rd
Guilford, VT 05301-7174
(802) 257-8138
perwin1943@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:47:50 AM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

1. Require an inventory and map of all known tiled fields and tile exits.
2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

I have no interest in overburdening our agricultural economy. I understand that, after tourism, agriculture is the major driver of the economy in our state. But we cannot let one driver and interest group damage and cause negative externalities for the the rest. Our lake and streams, particularly Lake Champlain, are far too important.

Please ensure that appropriate, empirically based, reasonable protections are put into place.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Norm Staunton
2 West St
Essex Junction, VT 05452-3517
(802) 272-4565
norm.staunton@gmail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:47:49 AM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

Including the following four recommendations would improve the tile drain rule and the health of our rivers and lakes.

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2. Require tile effluent monitoring of pesticides, phosphorus, and nitrogen.
3. Develop a permit for the installation of new tile drains.
4. Revisit the required agricultural practices in five years to update best management practices.

Vermont should be working to clean up the phosphorus and toxic chemicals already in the lake. We can't pass up an opportunity to prevent more from flowing in.

By incorporating these recommendations, you can help ensure clean water for all Vermonters.

Sincerely,

Mr. Robert Kasvinsky
660 Ring Rd
Waterbury Center, VT 05677-4428
(617) 633-8001
bob.kasvinsky@usa.net

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:47:49 AM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

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Sincerely,

Ms. Melanie Cote
2825 Hollow Rd
North Ferrisburgh, VT 05473-6600
(802) 425-4441
cotem@ymail.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:22:43 AM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

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Sincerely,

Ms. Mary Harbaugh
100 Congress St
Saint Albans, VT 05478-1646
(802) 524-4626
mary@strongstreet.com

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To: [AGR - RAP](#)
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Date: Monday, April 16, 2018 11:22:43 AM

Apr 16, 2018

Vermont AGR Vermont Agency of Agriculture

Dear Vermont AGR of Agriculture,

As Vermont drafts its tile drain rule, it is imperative that runoff into Lake Champlain and rivers draining into it is taken into account. The current rule is insufficient to address the negative impacts of tile drains, which cause phosphorus, chlorides, silt/sediment, E. coli and other pathogens, nitrogen and agrochemicals to run into Vermont waterways. This pollution is dangerous for humans and animals alike.

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Sincerely,

Mr. Donald Rendall
241 Spinnaker Ln
Shelburne, VT 05482-7779
(802) 985-2067
drendall@aol.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:17:50 AM

Apr 16, 2018

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Sincerely,

Dr. Steven Handwerker
103 S Beach Rd
South Burlington, VT 05403-7732
(561) 371-0412
peacewk@peacewk.org

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Sincerely,

Dr. Lance Poly
46 Fields Ln
Jericho, VT 05465-9627
(802) 899-2303
lpvt14@gmail.com

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Sincerely,

Dr. Gregory Mikkelson
PO Box 332
Richford, VT 05476-0332
(514) 398-8630
gregory.mikkelson@mcgill.ca

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Monday, April 16, 2018 11:17:48 AM

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Sincerely,

Mr. Jeff Kiralis
410 Potato Hill Rd
Fairlee, VT 05045-9598
(602) 333-1234
kiralis@tutanota.com

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Sincerely,

Mr. Peter Erb
32 Fox Mdws
Hinesburg, VT 05461-4436
(802) 482-6477
perb@gmavt.net

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Sincerely,

Mr. Numa Haase
119 Elm St
Montpelier, VT 05602-2821
(802) 223-1308
numah@yahoo.com

From: Conservation Law Foundation
To: [AGR - RAP](#)
Subject: Keep phosphorus pollution and agrochemicals out of Lake Champlain.
Date: Friday, June 15, 2018 3:50:57 PM

Jun 15, 2018

Vermont AGR Vermont Agency of Agriculture

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Sincerely,

Mrs. Janice Banks
14 Maple St
Center Barnstead, NH 03225-3602
(603) 269-3116
jabanks@tds.net

ATTACHMENT C

How the December 5, 2016 RAP Amendment Addresses Tile Drainage

RAPs Addressing TDs

Manure & Fertilization Application

1. Manure & Fertilizer Overapplication – 6.05(h)
2. Weather and Soil Conditions – 6.05(d)
3. Setbacks from surface inlets – 6.07(c)
4. 20 PPM STP Reduction Strategy – 6.03(d)
5. P-Index w/ Tile Drain Loss Pathway - 6.03(a)

Nutrient Storage

6. Surface Inlets for Stacking “Conveyance to SW”
6.02(e)(4)(D)

Soils

7. Health and OM Practices: 2T → T – 6.04(a)-(b)

Mapping / Identification

8. P-Index (v6.0) requires field ID for system tile.

Manure & Fertilizer Application

1. Issue: Manure and Fertilizer Application: “Manure or fertilizer applications to soils prone to preferential flow, close in time to storm events *or at rates in excess of crop need can lead to significant P losses.*” (LCBP, 5)
 - a. Solution: Overapplication of Nutrients Prohibited in RAPs
 - i. RAP 6.05(h) Manure or other agricultural wastes shall not be applied in exceedance of nutrient recommendations such that it ceases to be useful or beneficial for plant uptake.
2. Issue: Weather and Soil Conditions: “Manure or fertilizer applications to soils prone to preferential flow, *close in time to storm events* or at rates in excess of crop need can lead to significant P losses.” (LCBP, 5)
 - a. Solution: Application before or during storm events prohibited in RAPs
 - i. RAP 6.05(d) Manure or other agricultural wastes shall not be applied when field conditions are conducive to flooding, runoff, ponding, or other off-site movement, or can be reasonably anticipated to result in flooding, runoff, ponding, or other off-site movement, regardless of NMP recommendations.
3. Issue: Manure Application Setbacks from Surface Inlets: P losses tend to be equivalent to those representative of surface runoff, higher than typical of tile drainage. (LCBP, 39)
 - a. Solution: Treat surface inlets as surface water pathway in RAPs
 - i. RAP 2.34 Surface Inlet or Open Drain means an aboveground structure that receives, collects, or redirects field runoff water to other underground drainage or ditches.
 - ii. RAP 6.07(c) Surface inlets or inlets of open drains shall be buffered from croplands by 25 feet of perennial vegetation.
4. Issue: Elevated Soil Test P Leads to Greater Concentrations of P in Tile Drainflow: “A soil test P threshold (i.e. “change point”) is believed to exist, above which a unit increase in soil P results in higher P concentrations and losses in drainflow.” (LCBP, 6)
 - i. Issue: Literature shows there is, however, no consensus on the value of the STP concentration threshold – however **significant increases in subsurface P concentration are more likely to occur when STP levels are nearly four times greater than agronomic levels.** (King, JEQ – 473)
 - ii. UVM Soil Test Recommendations: 4.1 – 7 ppm Available P MM As “Optimum” -> Would suggest that agronomic changepoint on MM scale is between 16.4 – 28 ppm P MM
 - a. Solution: At “Excessive” [20 ppm] changepoint on MM Soil Test P have a drawdown strategy
 - i. RAP 6.03(d) Owners and operators of annual cropland, perennial grass land, or hay land who are required to implement a USDA 590 standard nutrient management plan and who have soil analyses demonstrating greater than 20 parts per million (ppm) phosphorous shall implement appropriate provisions of an approved nutrient management plan that balances excessive soil phosphorus levels with management strategies to reduce those levels, including eliminating or reducing manure applications.

Work Cited:

Lake Champlain Basin Program. Literature Review: Tile Drainage and Phosphorus Losses from agricultural Land. November 23, 2016.

King, K.W., M.R. Williams, M.L. Macrae, N.R. Fausey, J. Frankenberger, D.R. Smith, P.J.A. Kleinman, and L.C. Brown. Phosphorus Transport in Agricultural Subsurface Drainage: A Review. J. Environ. Qual. 44:467–485 (2015) doi:10.2134/jeq2014.04.0163

5. Issue: Fundamental Nutrient Management Practices improve tile drain water quality: Numerous management measures have been proposed to reduce P loads delivered by subsurface drainage, starting with fundamental nutrient management practices – apply manure and fertilizers at the right rate, in the right location, and at the right time (e.g., not when tile lines are flowing). [LCBP, 6]
- a. Solution: Exceptional NMP Standards Required in RAPs
- i. RAP 6.03(a) All Certified Small Farm Operations as defined in Section 4 of this rule and all permitted Medium and Large Farm Operations managing manure, agricultural wastes, or fertilizer for use as nutrient sources shall implement a field-by-field nutrient management plan consistent with the requirements of the USDA NRCS Nutrient Management Practice Code 590 or other equivalent standards approved by the Secretary.
 - ii. P-Index v6.0 required for 590: The revised P-Index tool, whose revision was led by the University of Vermont Extension, has been updated to predict phosphorus losses from system pattern tile drained fields, and the revised tool is required to be completed by all LFO, MFO and CSFO farms beginning for crop season 2018.

Nutrient Storage

6. Issue: Manure Stacking Setbacks from Surface Inlets: P losses tend to be equivalent to those representative of surface runoff, higher than typical of tile drainage. (LCBP, 39)
- a. Solution: Treat surface inlets as surface water pathway in RAPs
- i. RAP 2.34 Surface Inlet or Open Drain means an aboveground structure that receives, collects, or redirects field runoff water to other underground drainage or ditches.
 - ii. RAP 6.02(e)(4)(D) Field stacking of manure or other agricultural wastes on sites not approved consistent with USDA NRCS standards, or otherwise approved by the Secretary: shall not be sited within: **100 feet from a ditch or conveyance to surface water.**

Soil Management

7. Issue: In-Field Agronomic and Conservation Practices to reduce nutrient losses to waters from tile drains
- i. Issue: In addition to the assessment of individual management practices, information is needed on the cumulative effect of multiple in-field and edge-of-field practices on P transport. This could lead to identifying a set of practices that result in the greatest decreases in P delivery to surface waters. Although the general consensus is that these practices are directionally correct, comprehensive assessments of P loss in surface runoff and subsurface drainage are required. (King, JEQ, 480)
- a. Solution: Improve Soil Health and Reduce Surface Erosion in RAPs
- a. RAP 6.04(a) Soil management activities that increase organic matter, reduce compaction, promote biological activity, reduce erosion, and maintain appropriate nutrient levels shall be considered and implemented as practicable.
 - b. RAP 6.04(b) Cropland shall be cultivated in a manner that retains soil in the field and promotes soil health while minimizing visible erosion into buffer strips, across property boundaries, or that creates gully erosion. The performance management standard for the soil **must result in an average soil loss less than or equal to the soil loss tolerance (T)** for the prevalent soil type as calculated through application of the Revised Universal Soil Loss Equation 2 or through the application of similarly accepted models.

Mapping / Identification

8. Issue: There is a lack of available information about the presence of tile drains in farm fields in Vermont; mapping of drainage systems has been proposed as a means to quantify the extent and density of tile drainage throughout the State. Once the extent has been captured, decisions about management strategies can be made that will work towards improving water quality. For VAAFMM to make informed decisions regarding tile drain mapping, it has been clearly stated that more data and access to information are crucial.
- a. Solution: P-Index (v6.0) requires field ID for system tile – Part of 590 NMP.
- i. The option for mapping tile systems through the submission of information gathered by the P-Index and farm field boundary shapefiles, could be required of farms as part of their annual planning process. A mapping technique focused on presence/absence of tile drainage systems in fields, and includes reporting total tiled acres on farms, would provide VAAFMM with usable data, fill knowledge gaps, and allow for decision making to occur in a more timely manner with a significantly smaller financial burden. This information could be collected by requiring electronic submission of NMP data annually for certified and permitted farms.