

Part 9 - Common Land Application Protocols

The regulations for land application of nutrients determine when spreading may occur, and under what conditions it is appropriate. The rate of application is dependent on individual site characteristics. Requirements with respect to sensitive features, setbacks and times when no application can occur are given in the regulations, with the following expanded guidelines. Unless a phase-in is specified in the regulation, these requirements come into effect as soon as the regulation is filed.

9.1 APPLICATION RATES FOR LIQUID PRESCRIBED MATERIALS

Liquid materials should not be applied at rates where the material would run off the application site. The maximum application rate is defined by the runoff potential of the site, which in turn depends on the field slope and the permeability of the soil. The risk of runoff is much greater from a sloping field than from a level one, and from a clay soil than from a gravelly soil. These relations are described in the following tables.

9.1.1 Single Application Liquid Loading Limit

Runoff potential (see Table 2)	Maximum application rate if applied to the surface of land	Maximum application rate if injected, incorporated ¹ after application or applied to pretilled ² land
High	50 m ³ /ha	75 m ³ /ha
Moderate	75 m ³ /ha	100 m ³ /ha
Low	100 m ³ /ha	130 m ³ /ha
Very Low	130 m ³ /ha	150 m ³ /ha

¹ Incorporation must occur within 24 hours of manure application.

² Pretillage must have occurred no more than 7 days prior to manure application.

9.1.2 Runoff Potential

Soil hydrologic group (see Ontario Ministry of Agriculture and Food Ontario Drainage Guide)	Maximum sustained field slope within 150 m of watercourse			
	< 3 %	3 - 6 %	6 – 9 %	9 – 12 %
A (Rapid)	Very Low	Very Low	Low	High
B (Moderate)	Very Low	Low	Moderate	High
C (Slow)	Low	Moderate	High	No Application
D (Very Slow)	Moderate	High	High	No Application

Application of liquid prescribed materials is not allowed on land with slope greater than 12%.

Note: Slope as a percentage is another way of expressing rise over run. I.e 12/100 is 12%

9.2 LAND WITH TILE DRAINAGE

When liquid materials are applied to land with tile drainage, the quality of the tile water leaving the field must be monitored, if possible. If it is not possible to monitor the tile water, then either the field must be pre-tilled within seven days before manure application, or the application rate must be below 40 cubic meters per hectare.

There must also be a contingency plan for liquid application on land which is tile drained. When monitoring demonstrates that liquid prescribed materials are in the tile, then the contingency plan must be implemented. This plan must outline the actions required to stop the release from the tile, and either contain the contaminated water or direct it to an area for treatment or absorption into the soil.

9.3 SETBACKS

9.3.1 Setbacks from Private Wells

The construction and siting standards for wells are covered under Regulation 903 of the Ontario Water Resources Act. In addition, setbacks for the land application of nutrients are specified in the Regulation to the Nutrient Management Act. The definition of wells in the regulation includes water wells, oil wells, gas wells and test wells.

9.3.2 Setbacks from Municipal Wells

Because of the greater exposure to water drawn from a municipal well than from a private well, there are more stringent limitations to land application near a municipal well. No nutrients are to be applied within 100 meters of any municipal well. In addition, within the two year time of travel zone to a municipal well, the soil must be pretilled before the application of liquid prescribed materials, or the rate of application must be less than 40 cubic meters per hectare. The rate of nitrogen application will be limited by the nitrogen index. For this purpose, the soils within the two year time of travel zone will be treated as if the hydrologic soil group were one category higher (that is, a "B" soil would be treated as if it were an "A" soil) than the category defined for the soil type in that area.

9.3.3 Setback from Surface Water

The minimum setback from the top of the bank adjacent to surface water is defined in the regulation. There may be wider setbacks required in the nutrient management plan by the Phosphorus Index or the material application rate, in which case the wider setbacks would take precedence.

"Surface Water" is defined as:

a natural or artificial channel that carries water continuously or intermittently throughout the year, and if intermittently has established vegetation within the bed of the channel that is not dominated by terrestrial plants. It also includes lakes, reservoirs, ponds, sinkholes, or wetlands. It does not include grassed waterways, temporary channels for surface drainage (furrows or shallow channels that can be tilled and driven through), rock chutes and spillways, roadside ditches (not meeting the definition for a continuous or intermittent stream) or temporarily ponded areas that are normally farmed.

“Wetland” is defined as land such as a swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that,

(a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface,

(b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants, and

(c) has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.

“Terrestrial plants” are defined as those species that are not hydrophytic. They would normally occupy lands that are not subject to inundation for more than short periods.

“Top of bank” is defined as the edge of a defined channel where there is a sharp change from the steep slope of the channel to the shallower slope of the field area; or where no such break in slope exists, the normal bank-full extent of the watercourse when it is carrying the maximum volume of water without flooding.

9.3.4 Setback from Residences and Designated Health or Educational Facilities

Setbacks from residences or designated health or educational facilities are specified in the regulations. Setbacks are measured from the nearest wall of a residence, or from the property line of a designated health or educational facility.

Definition of Residential Area: Four or more residential buildings on adjacent lots, generally one hectare or less in size sharing a common boundary. Lots located directly across the road from one another are considered as having a common boundary.

The definition of a “designated health or educational facility” is taken from Ontario Regulation 505/01, under the *Ontario Water Resources Act*, with the exception that it does not include land used for a school while the school is not in session. The definition does include:

- a delivery agent care facility,
- a health care facility,
- a school or private school, during that time of year when the school is in session
- a social care facility,
- a university, a college of applied arts and technology, or an institution with authority to grant degrees;

“day nursery” means a day nursery as defined in the *Day Nurseries Act*;

“delivery agent care facility” means,

- a place where an emergency hostel service that receives funding under the *Ontario Works Act, 1997* is provided,
- a domiciliary hostel that receives funding under the *Ministry of Community and Social Services Act*,
- a place where a resource centre program that receives funding under the *Day Nurseries Act* is provided, or
- a place where a recreational program that receives funding under the *Day Nurseries Act* is provided;

“health care facility” means a facility that provides overnight accommodation and that is,

- a hospital within the meaning of the *Public Hospitals Act* or the *Community Psychiatric Hospitals Act*,

- a private hospital within the meaning of the *Private Hospitals Act*,
- a psychiatric facility within the meaning of the *Mental Health Act*,
- a nursing home within the meaning of the *Nursing Homes Act*,
- a home within the meaning of the *Homes for the Aged and Rest Homes Act*,
- an approved charitable institution within the meaning of the *Charitable Institutions Act* that is approved under section 3 of that Act as,
- a halfway house where rehabilitative residential group care may be provided for adult persons,
- a home for the aged, or
- a home where residential group care may be provided for handicapped or convalescent adult persons,
- a cancer centre established by the Ontario Cancer Treatment and Research Foundation under the *Cancer Act*,
- a home for special care within the meaning of the *Homes for Special Care Act*,
- an approved home within the meaning of the *Mental Hospitals Act*,
- a commercially operated residence for seniors or retired persons, or any other similar commercially operated residence, where attainment of a mature age is a factor in being accepted for occupancy,
- a nursing station, health centre, clinic or other facility that receives funding through the Ministry of Health and Long-Term Care's Underserved Area Program, or
- a facility owned or leased by a person who receives funding from the Ministry of Health and Long-Term Care for one or more of the following health care support services that are provided to or are available to residents of the facility:
 - a residential treatment services program,
 - a withdrawal management services program,
 - a dedicated supportive housing project;

“private school” means a private school as defined in the *Education Act*;

“school” means a school as defined in the *Education Act*;

“social care facility” means,

- a facility designated by the regulations under the *Developmental Services Act* as a facility to which that Act applies,
- a residence licensed as a children’s residence under the *Child and Family Services Act*,
- a facility where child development services, child treatment services, child welfare services, community support services or young offenders services, within the meaning of the *Child and Family Services Act*, are provided, unless the facility is located in a private residence,
- a facility where child and family intervention services, within the meaning of Regulation 70 of the Revised Regulations of Ontario, 1990 made under the *Child and Family Services Act*, are provided, unless the facility is located in a private residence,
- a place where an emergency shelter service that receives funding under the *Ministry of Community and Social Services Act* is provided, unless the place is located in a private residence,
- a day nursery,
- a sheltered workshop that receives funding under the *Developmental Services Act* or the *Ministry of Community and Social Services Act*,
- a place where a supported employment program that receives funding under the *Developmental Services Act* or the *Ministry of Community and Social Services Act* is provided,
- a place where an adults’ community support service that receives funding under the *Developmental Services Act* is provided, unless the place is located in a private residence,
- a place where an employment preparation, training and job placement program that receives funding under the *Developmental Services Act* or the *Ontario Disability Support Program Act, 1997* is provided,
- a place where a violence against women program that receives funding under the *Ministry of Community and Social Services Act* is provided, unless the place is located in a private residence,
- a place where an aboriginal healing and wellness program is provided;

“school” means a school as defined in the *Education Act*;

“social care facility” means,

- a facility designated by the regulations under the *Developmental Services Act* as a facility to which that Act applies,
- a residence licensed as a children’s residence under the *Child and Family Services Act*,
- a facility where child development services, child treatment services, child welfare services, community support services or young offenders services, within the meaning of the *Child and Family Services Act*, are provided, unless the facility is located in a private residence,

- a facility where child and family intervention services, within the meaning of Regulation 70 of the Revised Regulations of Ontario, 1990 made under the *Child and Family Services Act*, are provided, unless the facility is located in a private residence,
- a place where an emergency shelter service that receives funding under the *Ministry of Community and Social Services Act* is provided, unless the place is located in a private residence,
- a day nursery,
- a sheltered workshop that receives funding under the *Developmental Services Act* or the *Ministry of Community and Social Services Act*,
- a place where a supported employment program that receives funding under the *Developmental Services Act* or the *Ministry of Community and Social Services Act* is provided,
- a place where an adults' community support service that receives funding under the *Developmental Services Act* is provided, unless the place is located in a private residence,
- a place where an employment preparation, training and job placement program that receives funding under the *Developmental Services Act* or the *Ontario Disability Support Program Act, 1997* is provided,
- a place where a violence against women program that receives funding under the *Ministry of Community and Social Services Act* is provided, unless the place is located in a private residence,
- a place where an aboriginal healing and wellness program is provided;

9.4 WINTER APPLICATION

Application of nutrients during the winter is undesirable because there is no growing crop to absorb the applied nutrients, and there are often conditions that could lead to the runoff of applied materials into surface water. Restrictions to the application of nutrients during the winter are outlined in the regulation.

9.5 BUFFER ZONES

Permanent vegetation in a buffer zone adjacent to surface water slows down the movement of runoff into surface water, filters out sediment and other particulate matter, and absorbs nutrients that would otherwise enter the surface water. These will all have a positive effect on surface water quality. The regulations require that all surface water be bordered by a vegetated buffer zone with a minimum width of three meters, measured from the top of the bank. This requirement is phased in, so that a farmer is required to have vegetated buffer zones at the same time as he is required to complete a nutrient management plan. Until the buffer is established, nutrient applications are subject to a wider setback from surface water.

Definition of Vegetated Buffer Zone

For the purposes of this regulation, a vegetated buffer zone is defined as an area that is maintained under continuous vegetated cover (perennial grasses, forbs or trees, including perennial forage crops that are harvested as hay or silage), adjacent to surface water sources.

9.6 BEDROCK AND GROUNDWATER

9.6.1 Minimum Depth to Bedrock

Fractured bedrock is present under most of Ontario's farmland. The overburden normally provides filtering of contaminants before it reaches this depth, but there are areas where the thickness of the overburden is not sufficient to provide this protection. Contaminants that reach the bedrock can move

downward into an aquifer with no restriction. Limits to the application of prescribed materials help to minimize this risk.

Application of non-agricultural source materials is not allowed on land with less than 1.5 meters of soil over bedrock, unless approved by the director of MOE.

Application of manure and other agriculture source material is allowed, subject to the limitations outlined in the regulation. The limits are applied relative to the shallowest soils over bedrock in the area of application.

9.6.2 Minimum Depth to Groundwater

Definition of Permanent Water Table: The shallowest zone in the soil which normally has positive water pressure, as recorded in the water well records for the nearest water well, or as determined by a test hole dug during the summer months.

“Unsaturated soil condition” can be tested by digging a hole or removing a soil core to a 30 cm depth, and observing whether water flows into the hole from the surrounding soil. Water will only flow under saturated conditions, so if water is observed the soil does not meet the criteria for nutrient application.

9.7 PRE-HARVEST WAITING PERIOD

Restrictions on the harvest of various crops following the application of non-agriculture source materials are listed in the regulation.

The food industry is very conscious of food safety, and has been very pro-active in specifying the minimum periods between manure application and harvest for food crops. They will not buy produce that does not meet their criteria. This is a more effective deterrent than any regulation.

9.8 INCORPORATION REQUIREMENTS BASED ON ODOUR CRITERIA

The incorporation requirements for prescribed materials, based on how odourous the material is, and the distance to a residence or designated health or educational facility, are listed in chart below. Additional requirements for municipal biosolids are set out in the regulation.

This chart applies to all prescribed materials other than municipal biosolids.

Material Odour Rating	Distance to Residence or Residential Area		
	<25 M to single residence <50 m to residential area or designated health or educational facility	25 to 90 m to single residence 50 to 450 m to residential area or designated health or educational facility	> 90 m to single residence > 450 m to residential area or designated health or educational facility
O1	No application	Incorporation recommended, except on hay or pasture	No restrictions
O2	No application	Incorporation required within 24 hours of application	Incorporation recommended, except on hay or pasture

O3*	No application	Incorporation required within 6 hours of application. Direct incorporation or injection recommended.	Incorporation required within 24 hours of application.* Direct incorporation or injection recommended.
<p>*High Odour materials may be spread on pasture or hayland where techniques that ensure the manure is placed below the vegetative cover are employed (e.g., low-pressure ground level application, sleigh foot applicator, etc). Separation distances from residences, residential areas and high conflict land uses apply.</p>			

Note: Odour Criteria are described in Part 14.8 of this Protocol.

