



# INFOSHEET #8

# ON-FARM STORAGE, TREATMENT AND MANAGEMENT OF MANURE AND OTHER PRESCRIBED MATERIALS

How to address concerns identified in Environmental Farm Plan Worksheet #8



Based on  
Environmental Farm  
Plan Workbook,  
4th ed. 2013

This infosheet outlines options to address concerns identified in your Environmental Farm Plan (EFP) as they relate to on-farm storage of livestock manure and other prescribed materials.

For prescribed materials that are located in a Source Water Protection Zone, the risk management measures needed to address the risk will be determined through the Source Water Protection process in your particular area. The measures may be the same as or more than required by EFP due to the proximity to a municipal drinking water supply. For more information, contact your local municipality or check their website under Source Water Protection Planning.

All options in this infosheet are classed as **Actions**, **Compensating Factors**, or **Monitoring**.



- **Actions** address the areas of concern identified, and will change the EFP rating to (3) or Best (4).
- **Compensating Factors** are alternatives that will adequately address the concern, but will not change the rating in the EFP worksheet.
- **Monitoring** is an alternative only in special circumstances. When and how monitoring can be used is explained in the infosheet.

In most cases, you'll need more information before choosing and implementing options. Sources for more information are noted at the end of this infosheet.

For help with technical terms, please see the full glossary in your EFP Workbook.

# LOCATION OF STORAGE OR OUTDOOR LIVESTOCK YARD

## 8-1. Distance from prescribed material (ASM or NASM) storage or outdoor livestock yard to nearest surface water

BACKGROUND	WHAT CAN YOU DO?
<p>The shorter the separation distance between the prescribed material storage or outdoor livestock yard and surface water, the greater the risk of contaminating surface water.</p> <p>Sloping topography and heavy soil increase the risk of runoff reaching surface water.</p> <p>See Section 63(3) of O. Reg 267/03 of the Nutrient Management Act, 2002, as amended.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Replace the prescribed material storage or outdoor livestock yard with one at a location that meets or exceeds the required distance from surface water:</b></p> <ul style="list-style-type: none"> <li>• your new location should change the final EFP distance rating to a (3) or (4) Best.</li> </ul> <p><b>OPTION 2 – ACTION</b></p> <p><b>Increase the flow path distance between surface water and prescribed materials storage or outdoor livestock yard:</b></p> <ul style="list-style-type: none"> <li>• reshape land or build diversion to direct runoff away from the surface water to a location in the field or along a flow path where it will not likely reach the surface water</li> <li>• allow permanent vegetation to grow in field and along flow path so that more nutrients can be absorbed</li> <li>• ensure any land-forming changes will not cause or increase erosion on either your property or neighbouring lands – professional assistance to site and design berms is recommended when such work is being considered, particularly along larger watercourses</li> <li>• check whether a permit is required to do work adjacent to surface water – contact your local Conservation Authority for more information</li> <li>• note that the flow path length must meet or exceed the minimum distance specified in the (3) category.</li> </ul> <p><b>OPTION 3 – MONITORING</b></p> <p>Storages that have, or will have within two years, adequate storage capacity for manure/prescribed materials and/or runoff, and are in good working condition:</p> <p><b>Monitor storage regularly – visually checking for leaks, cracks, holes, seepage or overtopping of storage.</b></p> <p><b>Consider constructing a temporary secondary containment to catch possible spills. Any new storage must meet NMA requirements as well as achieve a level 3 rating or greater.</b></p>
<p><b>BEFORE</b></p>  <p><b>The lack of separation distance and sloping topography made this old barnyard a risk for contaminating surface water.</b></p>	
<p><b>AFTER</b></p>  <p><b>The barn has been torn down and new housing built in a more suitable location.</b></p>	<p><b>See also:</b></p> <ul style="list-style-type: none"> <li>• Nutrient Management Act, 2002, <b>O. Regulation 267/03, as amended, and associated protocols and guidance documents</b></li> <li>• <b>OMAFRA factsheet</b> Constructing a Permanent Concrete or Steel Liquid Nutrient or Runoff Storage Facility for ASM, <b>Order no. 12-067</b></li> <li>• <b>NMAN/MSTOR – Ontario’s nutrient management planning and manure storage sizing software</b></li> </ul>



See the chapter on siting manure storage facilities on pages 30–37 in this BMP publication.



## 8-2. Distance from agricultural source material (e.g. manure) storage or the outdoor livestock yard to nearest well(s)

### BACKGROUND

In general, the greater the distance between the water well and storage or outdoor livestock yard, the lower the chance of well water becoming contaminated by any storage that leaks to ground water.

Similarly, the greater the distance between the water well and storage or outdoor livestock yard, the lower the chance that a spill could reach ground water through the well head.

The soil type, depth to water table and bedrock will also influence contamination potential.

### WHAT CAN YOU DO?

#### OPTION 1 – ACTION

##### Relocate storage or outdoor livestock yard the required distance away from the well:

- locate new storage downslope of well if possible
- the new storage location should change the final EFP distance rating to a (3) or (4) Best.

**Test well water for indicator bacteria at least three times a year, and once a year for other parameters (such as nitrate).**

#### OPTION 2 – ACTION

##### Drill new water well the required distance from the storage:

- the new water well location should change the final EFP distance rating to a (3) or (4) Best.

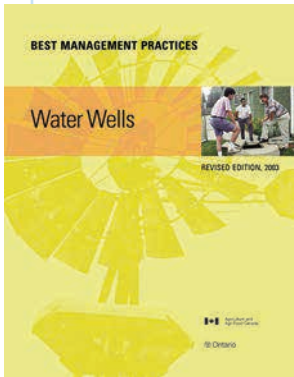
**Make sure the old well is properly abandoned according to Ontario Regulation 903 under the Ontario Water Resources Act.**

#### OPTION 3 – MONITORING

For earthen, concrete or steel storages that have adequate storage capacity and are in good working condition (no leaks or cracks):

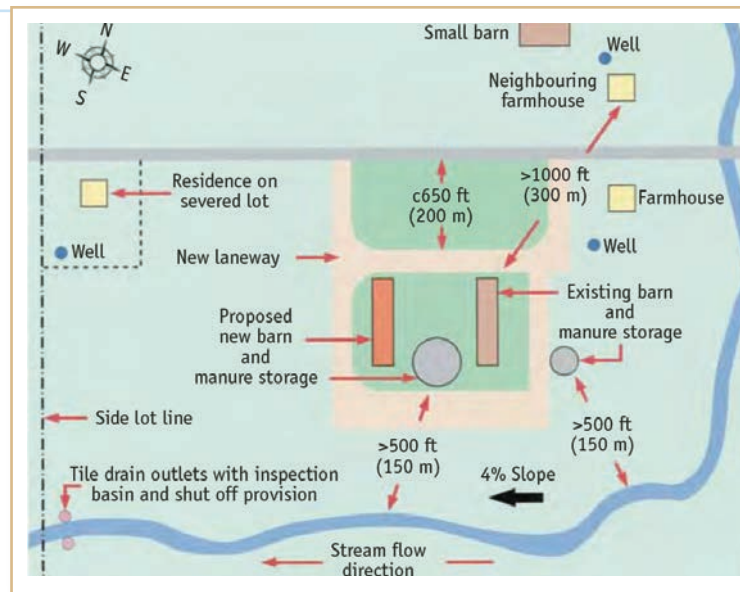
**Test the well water for indicator bacteria at least three times a year and once a year for other parameters (such as nitrate).**

**Note that monitoring of well water is NOT AN ADEQUATE OR LONG-TERM SOLUTION. In the event a test reveals contamination of the well water, have an action plan in place to immediately identify and address the source of contamination.**



This BMP publication explains rural water well construction, maintenance, and troubleshooting. It looks at how to manage site factors and farm practices to protect well water quality.

NMAN (version 3.2) is a software tool developed by OMAFRA to help generate nutrient management strategies and plans as well as NASM plans. It can identify risk factors for nitrogen movement to ground water, and provide minimum recommended separation distances from watercourses.



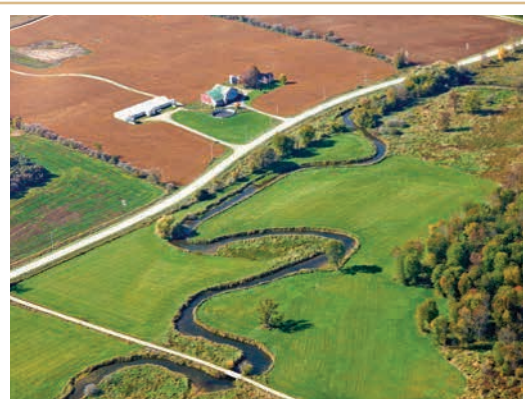
When choosing a site for livestock-related facilities, comply with separation distances to reduce risks to surface and ground water.

### 8-3. Distance from prescribed material storage or outdoor livestock yard to floodplain

#### BACKGROUND

Restrictions apply when siting prescribed material storages or outdoor livestock yards in the vicinity of floodplains.

See Section 63(4) of O. Reg. 267/03 of the Nutrient Management Act, 2002, as amended.



In some cases, a Conservation Authority may conclude that environmental benefits arising from building the storage at a given site outweigh the flooding risk.

#### WHAT CAN YOU DO?

##### OPTION 1 – ACTION

**Avoid a flood risk by relocating the storage or outdoor livestock yard away from a known or suspected floodplain:**

- if it is possible that the existing storage or livestock yard is in a floodplain, contact your local municipality or the local Conservation Authority to determine if floodplain mapping is available – ensure that new construction is outside the regulated flood lines
- in many cases, floodplain mapping in rural areas is not available. Your local Conservation Authority may be able to help estimate flood limits for a site to minimize a flood risk.

##### OPTION 2 – ACTION

**(Generally this action is only applicable to materials storages, not livestock yards, as yards are difficult to flood-proof.)**

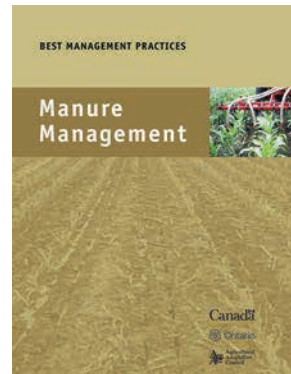
**Implement flood-proofing measures approved by the local Conservation Authority. Ensure:**

- approvals are obtained from local Conservation Authority PRIOR to construction for proposed flood-proofing measures for new prescribed materials storage
- the top elevation of the storage exceeds the flood lines
- the structure is designed to withstand a potential flood situation
- both the engineer and contractor retained to design and construct/modify the storage are aware of the flood-proofing measures required by the local Conservation Authority.

##### OPTION 3 – ACTION

**Seek approval for the prescribed material storage or the outdoor livestock yard location from the local Conservation Authority:**

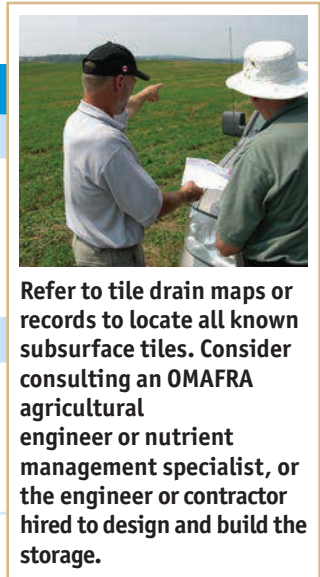
- in some cases, full flood-proofing of an existing or new prescribed materials storage may be extremely difficult. The Conservation Authority may conclude that other environmental benefits arising from building the storage at a site are greater than the flooding risk. CA staff can assist in determining this.



This BMP publication has a chapter on siting manure storage facilities, starting on page 30.

## 8-4. Distance from the prescribed material storage or the outdoor livestock yard to subsurface perforated plastic, clay or concrete drainage tile

BACKGROUND	WHAT CAN YOU DO?
<p>Subsurface drainage can act as a conduit for both clean and contaminated water. Contaminated liquids from storage or outdoor livestock yard are less likely to move if there are no subsurface tile drainage systems in close proximity to the storage.</p> <p>See Section 63(2) and (5) of O. Reg. 267/03 of the Nutrient Management Act, 2002, as amended.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Remove all drainage tile located beneath and within 15 m (50 ft) of the storage:</b></p> <ul style="list-style-type: none"> <li>refer to tile drain maps or records to locate all known subsurface tiles – the task may require some trenching within 15 m (50 ft) of the storage to find all subsurface drains</li> <li>conduct all clean water around the storage (e.g. eavestrough water, upslope diversion water).</li> </ul> <p><b>OPTION 2 – ACTION</b></p> <p><b>Cut off and redirect all tile drainage located within 15 m (50 ft) of storage or outdoor livestock yard through an observation and shut-off station:</b></p> <ul style="list-style-type: none"> <li>this is an option when drainage tiles are located beneath and near the storage and cannot be safely or easily removed.</li> </ul>



# LIQUID PRESCRIBED MATERIAL STORAGE AND TREATMENT STRUCTURES

## 8-5. Design of liquid prescribed material storage or anaerobic digester

BACKGROUND	WHAT CAN YOU DO?
<p>Storage structures or anaerobic digester (AD) tanks must be structurally sound. A major failure is very serious, potentially causing extensive environmental damage and presenting risk to human and/or animal safety. A minor failure (e.g. a leak) could cause continuous contamination of ground and surface water. Failures causing off-farm environmental contamination can have legal ramifications as well, in the Drainage Act, Environmental Protection Act, Water Resources Act, or Fisheries Act.</p> <p>Through the Ontario Building Code Act, municipalities and townships will require building permits that have acceptable design plans.</p> <p>For farms that are provincially regulated through the Nutrient Management Act, 2002, Ontario Regulation 267/03, as amended, any new concrete, earthen or steel manure storage that was built on the operation since the farm was phased-in under these regulations must meet the minimum construction standards defined by the regulations.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Visually evaluate the existing storage for leaks, cracks, slumping and rodent damage:</b></p> <ul style="list-style-type: none"> <li>if your assessment reveals a concern, <b>hire a qualified third party</b> to make an independent assessment of the structure. If required, replace storage with a new structure meeting the design standards specified through the Nutrient Management Act, 2002, Ontario Regulation 267/03, as amended.</li> </ul> <p><b>Document the repairs that were made by preparing or updating an approved nutrient management strategy.</b></p> <p><b>OPTION 2 – ACTION</b></p> <p><b>Replace storage structure or AD tank:</b></p> <ul style="list-style-type: none"> <li>size the new storage to match or exceed the livestock housing capacity of the barn or facility it services</li> <li>ensure the design meets all building code requirements</li> <li>ensure it meets or exceed the regulation standards associated with the Nutrient Management Act, 2002</li> <li>properly decommission any unused storages.</li> </ul>

Gaseous Fuel Code – administered by Technical Safety Standards Authority (TSSA), [www.tssa.org](http://www.tssa.org)

Ontario Electrical Safety Code – administered by Electrical Safety Authority (ESA), [www.esasafe.com](http://www.esasafe.com)

National Farm Building Code of Canada – [www.nationalcodes.nrc.gc.ca](http://www.nationalcodes.nrc.gc.ca)

## 8-6. Capacity of liquid agricultural material storage

### BACKGROUND

Having sufficient capacity to store liquid agricultural material gives you greater flexibility for scheduling spreading in an environmentally acceptable manner.

The Nutrient Management Act, 2002, Ontario Regulation 267/03, as amended, sets minimum storage requirements for all liquid agricultural material storages constructed since September 2003 on farms phased-in under the NMA. See sections 47, 48 and 69 and 69.1 of O. Reg. 267/03, as amended, and associated protocols.



Adequate storage of material provides a larger window of opportunity to spread in an environmentally acceptable manner.

### WHAT CAN YOU DO?

#### OPTION 1 – ACTION

**Build additional manure storage to increase storage capacity to 240 days or more.**

#### OPTION 2 – ACTION

**Prepare a nutrient management plan, showing that present storage capacity is adequate:**

- developing a nutrient management strategy/plan will help you ensure and demonstrate that you have sufficient storage to avoid winter spreading.

#### OPTION 3 – ACTION

**Reduce input to existing storage:**

- roof the storage – eliminating direct rainfall allows for more available capacity
- reduce the volume of clean water or manure-contaminated water entry to storage (see options in 8-12 and 8-13 in this infosheet)
- only house the number of animals for which there is adequate manure storage capacity
- build a separate system to handle milking centre washwater (e.g. sediment tank and treatment trench)
- prevent snow from drifting into storage.

#### OPTION 4 – ACTION

**Arrange for a licensed manure broker to store and transport your manure off-farm:**

- check to ensure that the manure broker has sufficient storage available (240 days or more) to handle the volume of manure you are wanting to transfer off-farm
- always get it in writing. You will need the documentation if your farm requires a nutrient management strategy/plan under the Nutrient Management Act, 2002 regulation or local bylaw.

#### See also OMAFRA factsheets:

- Constructing a Permanent Concrete or Steel Liquid Nutrient Storage Facility for ASM, **Order no. 12-063**
- Constructing a Permanent Solid Nutrient Storage Facility for ASM, **Order no. 12-067**
- Constructing an Earthen Liquid Nutrient or Runoff Storage Facility, **Order no. 06-005**
- Storage of Liquid Manure, **Order no. 10-051**



## 8-7. Reducing the volume of washwater and manure entering liquid agricultural source material storage

### BACKGROUND

Reducing the volume of washwater and manure entering the storage reduces environmental risk and operating costs associated with manure handling.



Reducing the volume of liquids that must be stored will mean savings in handling, transportation and application costs.

### WHAT CAN YOU DO?

#### OPTION 1 – ACTION

At least **two** of the following measures are required for this option to be acceptable.

##### 1. Reduce use of washwater in barn:

- consider installation of higher pressure and/or hot washing systems that use less washwater
- use recaptured washwater or flushing water instead of clean water (e.g. reuse washwater from milking equipment to wash parlour floors).

##### 2. Reduce or eliminate leakage from drinkers:

- consider installation of wet/dry feeders in swine finishing barn
- avoid plugging of drinkers (install filters, new style drinkers etc.)
- maintain drinkers on a regular basis.

##### 3. Increase efficiency of feed usage:

- use a proper nutritional balance of feed components
- test feed for nutritional content
- avoid spoilage and wasting of feed products.

#### Nutrient Management Act, 2002

And

#### Ontario Regulation 267/03

Amended to O. Reg 284/13

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And

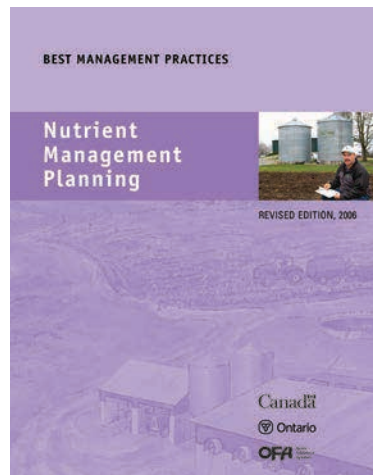
#### Ontario Regulation 230/07

Filed: June 6, 2007

Gazetted: June 23, 2007

#### With Protocols:

Nutrient Management Protocol, July 25, 2012  
 Sampling and Analysis Protocol, July 25, 2012  
 Nutrient Management Tables, July 25, 2012  
 NASM Odour Guide, July 25, 2012



With this step-by-step BMP publication, learn how to inventory nutrient sources, interpret results, plan application, keep records, monitor and make adjustments.

To view the Nutrient Management Act, 2002, Ontario Regulation 267/03, go to:  
[www.e-laws.gov.on.ca/html/regs/english/elaws\\_regs\\_030267\\_e.htm](http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_030267_e.htm)

### 8–8. Liquid prescribed material (e.g. liquid manure) transfer system (from barn to storage or from storage to storage)

BACKGROUND	WHAT CAN YOU DO?
<p>If a transfer system fails, a liquid tank could empty – causing significant environmental damage and/or creating a human and animal health hazard.</p> <p>Some livestock farms have long-term liquid storage tanks located at an elevation higher than the barn floor or gutter. If these farms do not have transfer pipes with an air break, they must have a transfer system that relies on a valve to prevent backflow.</p> <p>If your farm is in this category, you should review the equipment available and operating procedures used to prevent backflow.</p>	<p><b>OPTION 1 – ACTION</b></p> <p>Ensure transfer system meets <b>0.Reg. 267/03 construction standards for transfer systems.</b></p> <p><b>Routinely inspect for leaks or cracks.</b></p> <p><b>Note that for liquid manure transfer systems regulated by the Nutrient Management Act, 2002, the regulation states a second check valve is required for compliance.</b></p>
	<p><b>OPTION 2 – ACTION</b></p> <p>Ensure transfer system meets <b>0.Reg. 267/03 construction standards for transfer systems.</b></p> <p><b>Routinely inspect for leaks or cracks.</b></p> <p><b>Install an “air gap” in line if long-term storage is located higher than gutter or transfer storage.</b></p>
	<p><b>OPTION 3 – ACTION</b></p> <p>Ensure transfer system meets <b>0.Reg. 267/03 construction standards for transfer systems.</b></p> <p><b>Routinely inspect for leaks or cracks.</b></p> <p><b>Install a second valve in transfer line, and install an alarm system to give warning if tank is about to overflow.</b></p>

For an online link to **0.Reg. 267/03**, see 8–7 on page 7.

### 8–9. Liquid prescribed material storage and anaerobic digester safety

BACKGROUND	WHAT CAN YOU DO?
<p>Liquid storages create a potential safety hazard on the farm. Entering a storage can cause injury or death from inhaling gases or drowning. Proper safety measures are required to address these hazards. Storages must meet or exceed current safety standards.</p> <p>Through the Ontario Building Code Act, municipalities and townships will require building permits that have acceptable design plans.</p> <p>Even if the farm no longer functions as a livestock enterprise, there can be existing storages filled or partially filled with liquids. These storages have the same safety concerns.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Implement all required safety measures:</b></p> <ul style="list-style-type: none"> <li>• install safety fencing or barrier (see Safety Fencing in EFP glossary)</li> <li>• post signs at all access points</li> <li>• remove ladder from storage</li> <li>• install safety railing or grate on all manure hopper openings greater than 100 mm (4 in.)</li> <li>• install valve or gas trap in transfer line between tank and barn</li> <li>• upgrade electrical equipment to meet current Electrical Safety Code.</li> </ul>
	<p><b>OPTION 2 – ACTION</b></p> <p><b>Remove unused storage.</b></p> <p><b>Make sure the storage is properly decommissioned:</b></p> <ul style="list-style-type: none"> <li>• contact OMAFRA for the most recent information on requirements for decommissioning a manure storage.</li> </ul>



**WARNING**

Lethal concentrations of hazardous gases can be found in confined spaces such as liquid storages. Never assume that the environment near a liquid storage is safe. See OMAFRA factsheet:

- Hazardous Gases on Agricultural Operations, Order no. 14-017



# SOLID PRESCRIBED MATERIAL STORAGE OR LIVESTOCK YARD

## 8–10. Storage capacity of permanent solid prescribed material (e.g. solid manure) storages

### BACKGROUND

Generally, a solid storage needs to have capacity of 240 days to avoid spreading in winter and wet weather.



**Eliminating direct rain and snowfall will free up available manure storage capacity.**

### WHAT CAN YOU DO?

#### OPTION 1 – ACTION

**Increase storage capacity to 240 days or more. Install an additional manure storage:**

- if cropping cycles, soil conditions, or your management choices as outlined in your nutrient management plan limit manure application frequencies to only the spring or summer months, manure storage capacity may need to be between 240 and 365 days.

#### OPTION 2 – ACTION

**Prepare a nutrient management plan:**

- a nutrient management plan/strategy will determine minimum days of storage required.

#### OPTION 3 – ACTION

**Only house the number of animals for which there is adequate manure storage capacity.**

#### OPTION 4 – ACTION

**Arrange for a licensed manure broker to store and transport your manure off-farm:**

- check to ensure that the manure broker has sufficient storage available (240 days) to handle the volume of manure you are wanting to transfer off-farm
- written agreements with a broker should be obtained and are required if your farm requires a nutrient management strategy/plan, either by the Nutrient Management Act, 2002 regulation or a local bylaw.

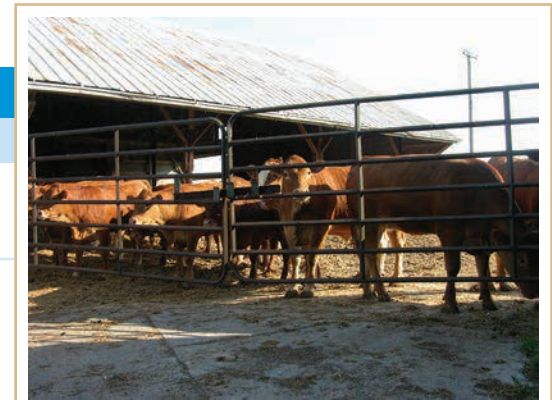
#### OPTION 5 – COMPENSATING FACTOR

**Use temporary field storage until you can provide adequate permanent storage capacity:**

- follow temporary field storage rules as outlined in O.Reg. 267/03, as amended. See also Section 8–15 in this infosheet.

### 8–11. Floor of permanent solid prescribed material storage or livestock yard

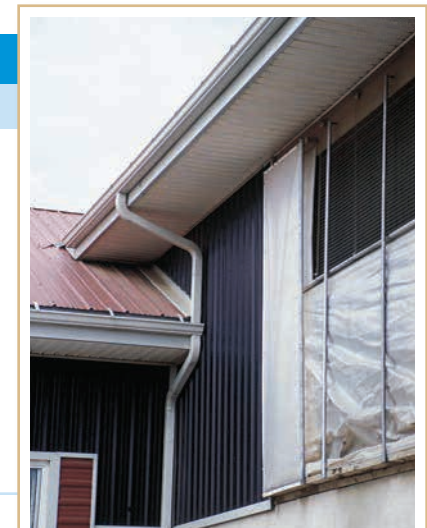
BACKGROUND	WHAT CAN YOU DO?
<p>For the storage of solid prescribed materials (e.g. manure) or a livestock yard, the only acceptable flooring is impervious to liquids. This prevents the downward movement of contaminants to the ground water.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Construct an impervious floor for the storage or the livestock yard (e.g. concrete or pavement).</b></p>



Use concrete, pavement or other impervious material for the floor of the storage or livestock yard.


### 8–12. Preventing clean water from entering prescribed material storage or yard area

BACKGROUND	WHAT CAN YOU DO?
<p>Reducing the amount of water entering the storage will reduce the amount of contaminated water that must be handled, and the added operating costs associated with handling the unwanted water.</p> <p>Control of clean water entry is one of the lowest-cost components in any manure management system.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Prevent any roof water or upslope water from entering storage or yard area:</b></p> <ul style="list-style-type: none"> <li>• install properly sized eavestroughing and outlet pipes to conduct water away from storage and livestock yard</li> <li>• re-route any surface water flows away from storage and yard</li> <li>• install diversion bumps at all entrances to storage and yard</li> <li>• use a vegetated flow path between the barn and storage to capture roof water and conduct away from storage</li> <li>• slope roofs away from storage</li> <li>• install fencing to reduce the entry of drifting snow.</li> </ul>



A properly designed eavestrough system will direct clean water away from storage or yard areas.

## 8–13. Control of runoff from a permanent solid prescribed material storage or outdoor livestock yard

BACKGROUND	WHAT CAN YOU DO?
<p>Runoff from solid storages should be contained and properly handled or eliminated. Uncontrolled runoff can have serious impacts on surface and ground water quality.</p> <p>Runoff causing off-farm environmental contamination could be addressed by the Drainage Act, Environmental Protection Act, Water Resources Act, or the Fisheries Act.</p> <p>Through the Ontario Building Code Act, municipalities and townships will require building permits that have acceptable design plans.</p> <p>Ontario Regulation 267/03, as amended, and associated protocols and guidance documents identify the minimum standards that solid storages built today in Ontario should meet.</p> <p>As with all other types of manure storages, runoff from solid storages with an earthen base should be contained and properly handled or eliminated. A manure storage with a soil base can have the added risk of contaminated water percolating into the ground beneath the pile and reaching ground water or tile drainage systems.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Install a roof over solid manure/solid prescribed material storage to eliminate direct precipitation from rain and snow:</b></p> <ul style="list-style-type: none"> <li>• ensure clean water does not enter solid manure storage (see 8–12 for more info)</li> <li>• if needed to soak up all liquids, increase manure dry matter content by adding more bedding</li> <li>• reduce the amount of water entering the manure in the barn.</li> </ul> <p><b>OPTION 2 – ACTION</b></p> <p><b>Install a liquid runoff storage system to properly capture and contain all runoff from solid storage or yard:</b></p> <ul style="list-style-type: none"> <li>• ensure the runoff storage is properly sized and designed</li> <li>• divert clean, upslope water away before it reaches the storage or yard</li> <li>• adjust storage size to accommodate any washwater to be added to storage (e.g. milking centre).</li> </ul> <p><b>OPTION 3 – ACTION</b></p> <p><b>Tarp storage to eliminate entry of direct rainfall and snowfall:</b></p> <ul style="list-style-type: none"> <li>• divert upslope water away before it reaches the storage location</li> <li>• securely tie down the cover.</li> </ul> <p><b>OPTION 4 – ACTION</b></p> <p><b>Construct a vegetated filter strip of the required size to receive the runoff:</b></p> <ul style="list-style-type: none"> <li>• this will require an engineered design to account for peak flows. Refer to O.Reg. 267/03 for details related to the design, approval and maintenance of such runoff management systems.</li> </ul>
 <p>The image shows the cover of a Best Management Practices (BMP) publication titled 'Manure Management'. The cover features a photograph of a manure storage structure in a field. Logos for Canada, Ontario, and the Agricultural Environmental Council are visible at the bottom.</p>	<p><b>OPTION 5 – ACTION</b></p> <p><b>Establish a physical barrier consisting of a permanently vegetated flow path to manage that runoff from solid storage:</b></p> <ul style="list-style-type: none"> <li>• earthen diversions redirect manure runoff to run alongside the watercourse or cause it to meander in an upslope area. This increases the distance that runoff has to travel before reaching surface water.</li> </ul> <p><b>Ensure any land-forming change will not cause or increase erosion on either your property or neighbouring lands. Professional assistance to site and design berms is recommended when such work is being considered, particularly along larger watercourses. A permit from the local Conservation Authority will be necessary if work is done in floodplain areas. Note that:</b></p> <ul style="list-style-type: none"> <li>• the length of flow path must be at least 300 m (984 ft) for stored manure of 30–50% dry matter (DM)</li> <li>• the length of flow path must be at least 100 m (328 ft) if the DM content of stored manure is greater than 50%</li> <li>• upslope water must be diverted away from the flow path.</li> </ul>

For more details about options, see the chapter on runoff management from yards and stored feeds, starting on page 74, in this BMP publication.



## 8-14. Control of runoff from an outdoor sacrifice or winter feeding area

### BACKGROUND

These areas need to be moved around regularly, but must meet the required distance from downslope surface water.



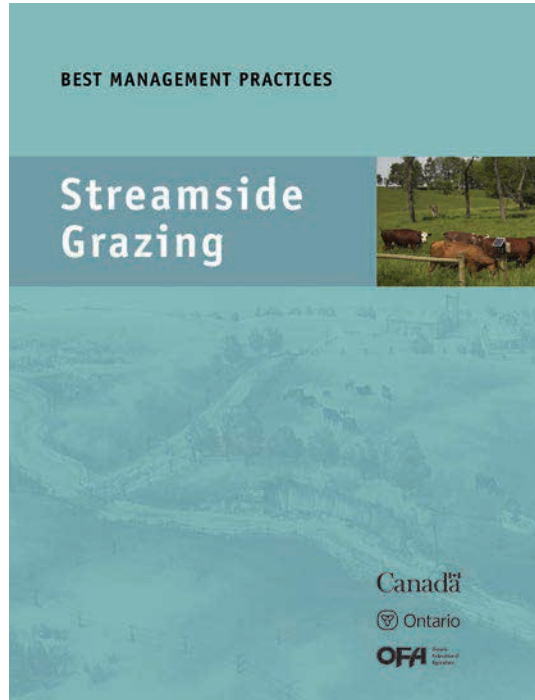
Establish winter feeding areas with a minimum of 30 m (100 ft) of permanently vegetated buffer from downslope surface water.

### WHAT CAN YOU DO?

#### OPTION 1 – ACTION

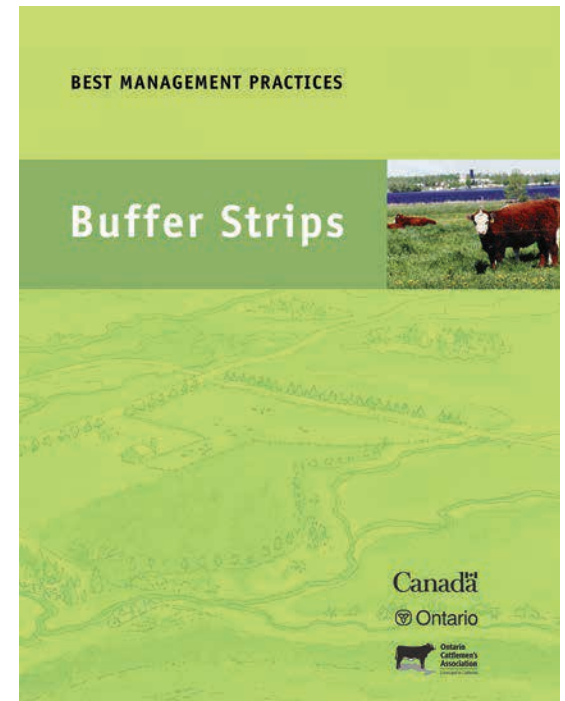
##### Plan and manage all outdoor sacrifice and winter feeding areas:

- remove excess manure solids from feeding area and land-apply to cropland
- reseed to re-establish vegetation over the area
- establish winter feeding areas with a minimum of 30 m (100 ft) of permanently vegetated buffer from downslope surface water.



If you would like to learn more about options to develop a workable grazing management plan that balances your production and environmental goals, see this BMP publication.

Well-managed buffer strips go a long way to filtering farm runoff before it enters streams, wetlands, ponds and lakes. This BMP book explains how to establish, maintain, and improve buffer strips according to the topography and land uses on your property.

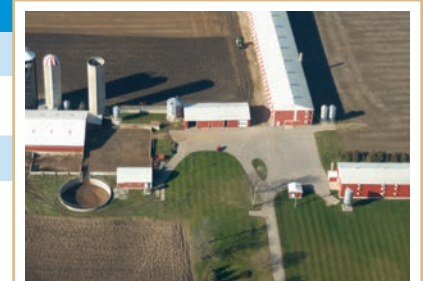


## 8–15. Temporary field storage or outdoor windrow composting (on soil base) of agricultural source materials (ASM) or Category 1 non-agricultural source materials (NASM)

BACKGROUND	WHAT CAN YOU DO?
<p><b>Temporary field storage = stacked in the field on soil base, 60 days or less</b></p> <p>Runoff from stored manure can cause significant environmental damage to surface and ground water. Off-farm contamination caused by runoff from temporary solid storages could be addressed by the Drainage Act, Environmental Protection Act, Water Resources Act, and/or the Fisheries Act.</p> <p>There is no “Best” category because field storage will not contain runoff. In general, it is not a best practice to stack solid prescribed materials on the ground for long-term storage. The Nutrient Management Act, 2002, Regulation 267/03 provides the option of temporary field storage if the site chosen and material stored result in a low-risk situation. See Sections 83 to 86 of O. Reg. 267/03, as amended, and guidance documents.</p> <p>OMAFRA Factsheet Temporary Storage of Solid Manure or Other Agricultural Source Material outlines siting and management criteria.</p> <p><b>Runoff from a composting site</b></p> <p>Runoff from a composting site needs to be managed. If not, a composting site may have a serious impact on surface and ground water quality.</p> <p>A well-managed composting process requires full attention to the moisture content, dry matter content, C:N ratio and temperature of the material being composted. Keep complete records of your composting management activities including where pile is located, dates when pile turned, compost pile monitoring results, compost analysis results, and dates that piles were established and removed.</p> <p>Off-farm environmental contamination caused by runoff from composting sites could be addressed by the Drainage Act, Environmental Protection Act, Water Resources Act, and/or the Fisheries Act.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Relocate temporary pile (stack in field for period of 60 days or less) on a site that meets all siting and management criteria:</b></p> <ul style="list-style-type: none"> <li>• more than 90 m (300 ft) from a drilled well or 200 m (656 ft) from any other well</li> <li>• not in a flood-prone area</li> <li>• maximum 3% slope</li> <li>• more than 100 m (330 ft) from surface water or tile inlet</li> <li>• minimum soil depth to bedrock is at least 0.6 m (2 ft)</li> <li>• minimum depth to water table under the pile and within 6 m (20 ft) of sides is at least 1.8 m (6 ft)</li> <li>• not on a tile-drained site, or if tile-drained there is a tile monitoring and shutoff station and a plan in place to deal with leachate entering tile</li> <li>• if the pile is ASM or Odour Category 1 (OC1) NASM, it is at least 125 m (410 ft) from a single residence and 250 m (820 ft) from a residential area</li> <li>• if the pile is Odour Category 2 (OC2) NASM, it is at least 200 m (656 ft) from a single residence and 450 m (1,477 ft) from a residential area.</li> </ul> <p><b>Runoff from a composting site</b></p> <p><b>Manage and monitor:</b></p> <ul style="list-style-type: none"> <li>• moisture content</li> <li>• dry matter content</li> <li>• C:N ratio, and</li> <li>• temperature of the material being composted.</li> </ul> <p><b>Keep complete records of your composting management activities, including:</b></p> <ul style="list-style-type: none"> <li>• where pile is located</li> <li>• dates when pile is turned</li> <li>• compost pile monitoring results</li> <li>• compost analysis results, and</li> <li>• dates piles were established and removed.</li> </ul>
	<div data-bbox="1640 285 2049 683" data-label="Image"> <p><b>Manure can be temporarily stored in field as long as all siting and management criteria are met.</b></p> </div> <div data-bbox="1640 764 2049 1143" data-label="Image"> <p><b>A well-managed compost site will not pose a risk to surface or ground water.</b></p> </div> <div data-bbox="1310 1243 1957 1484" data-label="Text"> <p><b>See also:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Guideline for the Production of Compost in Ontario, from Ministry of the Environment, Conservation and Parks</a></li> <li>• <a href="#">Manure Composting as a Pathogen Reduction Strategy, Order no. 05-021</a></li> <li>• <a href="#">Temporary Field Storage of Solid Manure or Other Agricultural Source Material, Order no. 10-039</a></li> </ul> </div>

## 8-16. Management of feedlot or yard snow

BACKGROUND	WHAT CAN YOU DO?
<p>When it melts, snow in a feedlot or yard will become mixed with manure and result in contaminated runoff.</p> <p>If runoff is not controlled, it may have a serious impact on surface and ground water quality. A soil base can have the added risk of contaminated water percolating into the ground and reaching ground water or tile drainage systems.</p> <p>Runoff from feedlots or yards should therefore be eliminated, or contained and properly handled.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Construct a roof over the feedlot or yard to prevent snow and ice buildup.</b></p> <p><b>OPTION 2 – ACTION</b></p> <p><b>Construct a storage to contain the water and manure runoff resulting from snow melt.</b></p>



All runoff from this walled yard is captured in a liquid storage tank.

## 8-17. Contingency plans

BACKGROUND	WHAT CAN YOU DO?
<p>All farmers should have a written contingency plan. It will help you react quickly and effectively, and demonstrates due diligence.</p> <p>A contingency plan includes the following:</p> <ul style="list-style-type: none"> <li>• an emergency plan, which outlines steps to be taken in the event of a manure or fertilizer spill</li> <li>• steps to be taken in the event that manure storages are filling up faster than expected, or weather conditions or equipment failures delay spreading.</li> </ul> <p>For Ontario farms regulated by the Nutrient Management Act, Ontario Regulation 267/03, as amended, requires that a contingency plan be part of the farm's nutrient management plan. (See Part III of O. Reg 267/03, as amended.)</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Prepare a contingency plan covering the critical risk points on your operation</b> (e.g. agricultural materials storage facilities, manure transfer systems, spreading near surface water, etc.).</p> <p><b>Ensure the plan is written and accessible, so that anyone in your operation can respond to an emergency.</b> Also keep the contingency plan reviewed and up-to-date.</p> <p>The “emergency plan” component of a contingency plan should include a list of emergency telephone numbers, including the MOECC Spills Action Centre, the local municipality, local emergency response or contracting companies with the type of equipment needed to address a manure spill.</p> <p>It should also include contact numbers for downstream water users who may be affected and neighbours who could provide assistance in an emergency situation. The Nutrient Management Act, 2002, Ontario Regulation 267/03, as amended, requires that contingency plans prepared for provincially regulated farms also demonstrate that thought has been given to the following situations:</p> <ul style="list-style-type: none"> <li>• when the actual amount of prescribed material ends up exceeding the design capacity of the storage facilities available</li> <li>• when weather conditions delay application plans and manure storage is at risk of exceeding capacity</li> <li>• when equipment unexpectedly becomes unavailable or breaks down and manure capacity is at risk of being exceeded</li> <li>• when any other situation occurs ( e.g. liquid runoff) that could result in the emergency handling of prescribed materials.</li> </ul> <p>Sample contingency plans are available from OMAFRA. However, every contingency plan should be tailored to the operation to which it applies, and address situations thought to be of highest risk. The EFP Contingency Plan booklet available from OSCIA contains one section on manure spills.</p>



A contingency plan must be site-specific – tailored to the operation to which it applies.



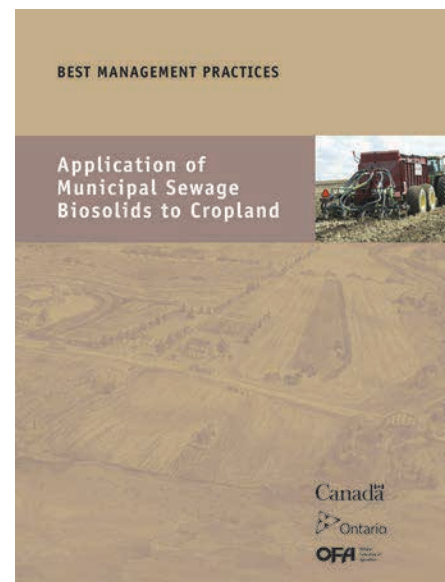
## 8–18. Distance from Category 1 NASM storage to well

BACKGROUND	WHAT CAN YOU DO?
<p>In general, the greater the distance between the NASM storage and wells, the lower the chance of well water becoming contaminated by any storage that leaks to ground water.</p> <p>Similarly, the greater the distance between the NASM storage and wells, the lower the chance a spill could reach ground water through the well head.</p> <p>The soil type, depth to water table and bedrock also influence the contamination potential.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Build storage the required distance away from the well:</b></p> <ul style="list-style-type: none"> <li>locate new storage downslope of well if possible</li> <li>the new storage location should change the final EFP distance rating to a (3) or (4) Best.</li> </ul> <p><b>Test well water for indicator bacteria at least three times a year, and once a year for other parameters (such as nitrate).</b></p> <p><b>OPTION 2 – ACTION</b></p> <p><b>Construct new water well the required distance away from the storage:</b></p> <ul style="list-style-type: none"> <li>make sure old well is properly abandoned according to Ontario Regulation 903 under the Ontario Water Resources Act</li> <li>the new water well location should change the final EFP distance rating to a (3) or (4) Best.</li> </ul>

## 8–19. Category 2 or 3 NASMs are stored on farm

BACKGROUND	WHAT CAN YOU DO?
<p>Storage of Category 2 (processed plant material) or Category 3 (may include meat processing and sewage biosolids NASM) requires an approved NASM plan.</p>	<p><b>OPTION 1 – ACTION</b></p> <p><b>Prepare, seek approval for, and follow a NASM plan:</b></p> <ul style="list-style-type: none"> <li>see Appendix A on pages 102 and 103 of the EFP Workbook for more information.</li> </ul>

The latest version of OMAFRA's NMN software tool, version 3.2, can be used to generate NASM plans as well as nutrient management plans/strategies.



For additional information about the use of sewage biosolids NASM, see this BMP publication.

## FOR MORE INFORMATION

### Ontario Ministry of Agriculture, Food and Rural Affairs

Many sources of supplementary information are available. Below are some suggestions to get you started. Most can be found online at [www.ontario.ca/omafra](http://www.ontario.ca/omafra) or ordered through ServiceOntario.

Constructing a Farm Building in Ontario, Order no. 07-007  
Constructing a Permanent Concrete or Steel Liquid Nutrient Storage Facility for ASM, Order no. 12-063

Constructing a Permanent Solid Nutrient Storage Facility for ASM, Order no. 12-067

Constructing an Earthen Liquid Nutrient or Runoff Storage Facility, Order no. 06-005

Decommissioning and/or Recommissioning Existing Nutrient Storage Facilities, Order no. 12-061

Hazardous Gases on Agricultural Operations, Order no. 13-025

Manure Composting as a Pathogen Reduction Strategy, Order no. 05-021

Storage of Liquid Manure, Order no. 10-051

Temporary Field Storage of Solid Manure or Other Agricultural Source Material, Order no. 10-039

NMAN/MSTOR – Ontario’s nutrient management planning and manure storage sizing software

Nutrient Management Act, 2002, O. Regulation 267/03, as amended, and associated protocols and guidance documents  
[www.ontario.ca/laws/statute/02n04?search=Nutrient+Management+Act](http://www.ontario.ca/laws/statute/02n04?search=Nutrient+Management+Act)

### BEST MANAGEMENT PRACTICES

BMP publications are excellent sources to better understand on-farm environmental issues and discover a range of proven, practical options to address them. BMP materials are available at no charge to Ontario farmers. Below are some sample titles. To order, see ServiceOntario information.

Application of Municipal Sewage Biosolids to Cropland

Buffer Strips

Controlling Soil Erosion on the Farm

Cropland Drainage

Field Crop Production

Managing Crop Nutrients

Manure Management

Nutrient Management Planning

Streamside Grazing

Soil Management

Water Wells

Water Management

### Inquiries to the Ontario Ministry of Agriculture, Food and Rural Affairs

Agricultural Information Contact Centre

Ph: 1-877-424-1300

Email: [ag.info.omafra@ontario.ca](mailto:ag.info.omafra@ontario.ca)

Web: [www.ontario.ca/omafra](http://www.ontario.ca/omafra)

### Many resources can be ordered through Service Ontario

Online at ServiceOntario Publications – [www.publications.serviceontario.ca](http://www.publications.serviceontario.ca)

By phone through the ServiceOntario Contact Centre

Monday–Friday, 8:30 am–5:00 pm

416-326-5300

416-325-3408 TTY

1-800-668-9938 Toll-free across Ontario

1-800-268-7095 TTY Toll-free across Ontario

## Additional Resources

### CONSULTATION

Local Conservation Authority (CA) – for floodplain-related questions

Engineer and contractor you have retained to design and construct the storage

Nutrient management specialist

NMAN/MSTOR (AgriSuite) – Ontario’s free nutrient and crop management software

[www.agrisuite.omafra.gov.on.ca/](http://www.agrisuite.omafra.gov.on.ca/)

### PUBLICATIONS

Farm Safety Association – Manure Gas Dangers  
[www.nasdonline.org/static\\_content/documents/48/d001616.pdf](http://www.nasdonline.org/static_content/documents/48/d001616.pdf)

Ontario Soil and Crop Improvement Association – EFP Contingency Plan booklet

## ACKNOWLEDGEMENTS

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**Infosheet #8 Contributing Authors:** Don Hilborn, Kevin McKague (Co-Chairs), Peter Doris, Mike Muffels, Christoph Wand – Ontario Ministry of Agriculture, Food and Rural Affairs; Anne Loeffler – Grand River Conservation Authority; Charlie Roland – Ontario Ministry of the Environment, Conservation and Parks; Patricia Learmonth, Margaret May, Rita Vogel – Ontario Soil and Crop Improvement Association