



2 FARMSTEAD

INTRODUCTION

This chapter discusses farmstead management for protection of the environment. It contains introductory information on the relationship between the farmstead and the environment. It also contains information on environmental concerns, legislation and beneficial management practices related to:

- ◆ buildings and roads
- ◆ farm waste
- ◆ chemical fertilizer
- ◆ petroleum
- ◆ woodwaste
- ◆ compost
- ◆ energy use
- ◆ heat production and agricultural boilers
- ◆ on-farm processing and sales

FARMSTEAD AND THE ENVIRONMENT

The primary role of the farmstead is to be the headquarters for farm production. Most farm construction, handling of wastes from septic and disposal sites, petroleum and woodwaste storage, composting, and processing and sales occur in this centralized location.

Many BC agricultural production sites are located in areas that are under intense pressure from non-agricultural activities. Concerns arising from farmsteads often relate to farm buildings and roads. Location, orientation and management of structures can significantly influence environmental impacts. Good site planning and management may also prevent disputes between neighbours.

BUILDINGS AND ROADS



The following discussion on buildings is meant to be general. Specific siting and management practices relating to fertilizers, petroleum, woodwaste, livestock, crops and pesticides buildings are found in their respective sections.

BUILDINGS AND ROADS ENVIRONMENTAL CONCERNS

Environmental concerns related to buildings and roads are:

- ◆ siting and construction that results in water pollution; or in unacceptable odours to neighbours
- ◆ escape of contents from buildings that results in air or water pollution
- ◆ impermeable surfaces such as building roofs, roads and yards that result in change of the flow, volumes and direction of runoff causing erosion or downstream flooding
- ◆ disruption of riparian vegetation, streams, lakes or wetlands due to stream crossings and bridges that result in impacts to aquatic life, wildlife and water quality

For information on these concerns:

- see Impacts on Biodiversity and Habitat, page 7-8, and refer to Farm Activities and Impacts
- see Water Quality and Quantity Factors, page 9-4, refer to Contaminants, and to Overland Flow
- see Air Quality Factors, page 10-1, refer to Contaminants, Dust and Particulates, and Odours

BUILDINGS AND ROADS LEGISLATION

The following is a brief outline of the main legislation that applies to buildings and roads.

- see page A-1 for a summary of these and other Acts and Regulations

Local Bylaws The National Farm Building Code 1995 outlines standards for building construction **and is enforced only where proclaimed by local governments.**



Agricultural Land Commission Act

This Act requires approval from the Agricultural Land Commission to utilize non-agricultural wastes on land within the Agricultural Land Reserve.



Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system



Environmental Management Act

Under the *Hazardous Waste Regulation* waste oil cannot be applied to land for the purpose of dust suppression.



Farm Practices Protection (Right to Farm) Act

This Act protects farmers from liability in lawsuits alleging nuisance associated with dust, odour, noise and other disturbances resulting from the farm operation when they meet certain regulatory conditions.



Fish Protection Act

The *Fish Protection Act* enables the protection of fish and fish habitats.

Under the Act and through the *Riparian Areas Regulation* the province can provide directives to local government to protect riparian fish habitat during their approval/allowance of residential, commercial, and industrial development. This includes residential buildings on land zoned for agricultural purposes.



Public Health Act

This Act has conditions under the Public Health Act Transitional Regulation and Sewerage System Regulation:

Public Health Act Transitional Regulation Section 18: requires separation distances from wells to be at least:

- ◆ 7 m from any dwelling house
- ◆ 30.5 m from any probable source of contamination (probable source of contamination could include septic fields, storage buildings containing potential harmful products such as drugs or paints and solvents)
- ◆ 122 m from any dumping ground

The *Sewerage System Regulation* requires separations distances (as defined in the  **Sewerage System Standard Practice Manual**) from wells to be at least:

- ◆ 15 m from a holding tank
- ◆ 30 m from a sewerage system



Water Act

This Act has a section to protect streams:

- ◆ Section 9: requires “changes in and about a stream” to be done in accordance with an approval, licence, or order of the Act, or Part 7 of the Regulations of the Act (e.g., excavations, diversions, dams, ditches, bridges and culverts)

The *Water Regulation*, Part 7, regulates “changes in and about a stream”

- ◆ Section 40: requires that notification be given to MOE for certain “changes”
- ◆ Section 44: lists “changes” authorized (not requiring an approval or licence)



Wildlife Act The provincial *Wildlife Act* protects wildlife designated under the Act from direct harm, except as allowed by regulation (e.g., hunting or trapping), or under permit. Legal designation as Endangered or Threatened under the Act increases the penalties for harming a species. The Act also enables the protection of habitat in a Critical Wildlife Management Area.

- ◆ Section 6: regulates species at risk
- ◆ Section 7: makes it an offence to alter, destroy or damage wildlife habitat within a wildlife management area
- ◆ Section 34: makes it an offence to possess, take injure, molest or destroy the nest of an eagle, peregrine falcon, osprey, heron or burrowing owl or the nest of any bird not mentioned above when the nest is occupied by the bird or its egg



Fisheries Act This Act has sections of importance to buildings and roads:

- ◆ Section 20: provides for safe passage of fish around obstructions (e.g., properly-sized culverts)
- ◆ Section 35: prohibits harmful alteration, disruption or destruction of fish habitat unless authorized (e.g., stream crossings)
- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include cleanup water from concrete construction or eroded soil from construction)
- ◆ Section 37: requires approval for any work that may impact fish
- ◆ Section 38(4): requires reporting infractions of Sections 35 or 36



Species at Risk Act This Act has sections that protect listed species, their residence and critical habitat. It applies to federal lands, internal waters (i.e., all watercourses), territorial sea of Canada, and the air space above them.

The provisions of the *Species at Risk Act* (known as the ‘safety net’) could be invoked on BC crown and private lands using a federal order under the Act if provincial action is not sufficient to protect listed species.

BUILDINGS AND ROADS BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable buildings and roads related legislation, including the above, and where appropriate, implement the following beneficial management practices to protect the environment.

Many of the following practices can be used on existing buildings and roads and all practices should be considered with new construction. Good site planning and management of structures can significantly reduce environmental impacts and may also prevent neighbour disputes.

Farm Building Siting Existing Building Sites. Evaluate farm activities to ensure that pollution is not occurring, and to verify that Normal Farm Practices are being followed. The *Farm Practices Protection Act* defines a normal farm practice as an activity “that is conducted by a farm business in a manner consistent with proper and accepted customs and standards as established and followed by similar farm businesses under similar circumstances.” When assessing an existing site, the following factors should be considered:

- ◆ potential for leachate generation and/or runoff from farm building sites
→ see Runoff, page 9-42
- ◆ proximity to sensitive areas (i.e. watercourses, habitat, domestic water sources, areas used for human activities)

New Building Sites. When selecting a new construction site, implement the following practices:

- ◆ for protection by the *Farm Practices Protection (Right to Farm) Act*
 - locate on land zoned for agriculture or in the Agricultural Land Reserve
 - follow Normal Farm Practices
- ◆ locate buildings with probable sources of contamination at least 30.5 m from a well (*Public Health Act*), 30 m or more from a water intake used for domestic purposes (suggested)
- ◆ locate buildings using setback “standards” from watercourses as outlined in the following publications and in the categories listed below
 - table 2.1, on page 2-7, summarizes the setback distances for each category of building
- ◆ in cases where watercourse classification mapping is not available, or in unique situations where setback standards create undue hardship or non-conformance is apparent, consult a qualified environmental professional
 - 📖 **Agricultural Building Setbacks from Watercourses in Farming Areas**
 - 📖 **Guide for Bylaw Development in Farming Areas**
 - 📖 **Flood Construction Levels and Setbacks for Farm Building Situations**

Category 1 facilities are structures, buildings, constructed surfaces, or areas identified by the *Agricultural Waste Control Regulation* which are considered to pose a high risk for causing pollution. Category 1 facilities include solid agricultural waste field storages with greater than two weeks storage, confined livestock areas with greater than ten agricultural units, and seasonal feeding areas.

- ◆ category 1 facilities must be set back 30 m from any watercourse

Category 2 facilities are structures, buildings, constructed surfaces, or areas covered by the *Agricultural Waste Control Regulation* and other regulations which are considered to pose a slightly lower risk for causing pollution than those in Category 1. Category 2 facilities include agricultural waste storage facilities (e.g., engineered manure pits); chemical, compost and wood waste storages; on-farm growing media production facilities; mushroom barns; confined livestock areas with less than ten agricultural units; silos; incinerators; and petroleum storages.

- ◆ category 2 facilities must be set back a minimum distance of 15 m from any watercourse

Category 3 facilities are structures, buildings, constructed surfaces, or areas which are at a higher risk of discharging contaminants than Category 4 buildings, are not identified by the *Agricultural Waste Control Regulation*. Examples of Category 3 facilities are livestock barns, brooder houses, fur farming sheds, livestock shelters and stables, hatcheries, and milking facilities.

Natural streams – watercourses that have not been significantly altered by human activity and are predominantly in their natural state

Channelized streams – permanent or relocated streams that have been dyked, diverted or straightened and carry drainage flows from headwaters or significant sources of groundwater. Reaches of channelized streams may be confined by roads and fences and in many cases can also meander through fields.

Man made channels that divert irrigation water from a stream but return overflow water back to a stream in a manner that allows fish access are classified as channelized streams.

Constructed ditches – man made drainage channels that carry drainage water from one property but do not carry water from headwaters or significant sources of groundwater. Flows in agricultural constructed ditches may be year round and are not regulated. Constructed ditches may also deliver water for irrigation purposes.

Constructed channels – man made drainage channels that carry drainage water from more than one property but do not carry water from headwaters or significant sources of groundwater. Flows in agricultural constructed channels may be year round and are not regulated. Constructed channels may also deliver water for irrigation purposes.

- ◆ category 3 facilities must be set back 15 m from natural and channelized streams and 5 m from constructed channels and constructed ditches, other than those maintained by municipalities, for which a 7 m setback is required

Category 4 facilities are structures, buildings, constructed surfaces, or areas for which a risk of discharging contaminants is not likely or can be easily contained. Examples of Category 4 facilities include greenhouses, machine storages, on-farm processing facilities, direct farm marketing facilities, crop storages, granaries, shelters, hives, machine and equipment storages, cideries, retention and detention ponds, and other impervious surfaces.

- ◆ category 4 facilities must be setback 15 m from natural streams. From channelized streams, a minimum setback of 10 m and a maximum of 15 m, is required based on two times the channel width measured from the top of bank. A 5 m setback must be left adjacent to constructed channels and constructed ditches other than those maintained by municipalities, for which a 7 m setback is required.

Take into account building setback standards as defined above, and implement the following practices when constructing a new building:

- ◆ locate on a sufficiently large land base to meet setback distances of facilities from property boundaries and consider providing room for expansion
- ◆ provide sufficient separation distance from
 - neighbours for dispersion of odour, dust and noise
 - watercourses to prevent wastes or leachate from entering
- ◆ favour sites that provide protection from wind by using windbreaks or by taking advantage of terrain
 - where protection is inadequate, favour sites where improvements can be made by planting windbreaks or constructing screens (these will also reduce noise, odour, and visual impacts an operation may have on adjacent property or occupants) → see Buffers, page 11-4
- ◆ locate structures (buildings, wind break fences, etc.) relative to one another to account for wind-drifted snow
- ◆ allow for ‘swirl chamber’ effects to deposit snow in out-of-the way locations
- ◆ make long-term plans so that future expansions do not interfere with effective waste cleanup and contaminated runoff control
- ◆ comply with local government bylaws and special management areas, if applicable
- ◆ locate on an adequately drained site, avoiding areas defined by a suggested one-in-100 year flood recurrence interval
- ◆ detain runoff from yards, buildings and roads such that peak flow to receiving watercourses is not increased over predevelopment levels
- ◆ site farm buildings such as livestock, nursery beds, greenhouses, or storages downslope from wells
- ◆ position high-activity buildings and work areas away from neighbouring residences to minimize sight and sound impacts
- ◆ avoid sensitive fish and wildlife habitat (e.g., bird nesting, riparian areas)
 - 📖 **Farmstead Planning** and 📖 **Siting and Management of Poultry Barns**
 - 📖 **Siting and Management of Dairy Barns and Operations**

Table 2.1 Building and Facilities Setbacks from Watercourses for Riparian Protection in Farming Areas * a f

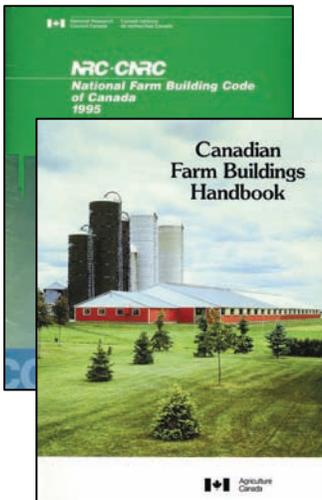
Watercourse Type	Category 1	Category 2	Category 3	Category 4
	<ul style="list-style-type: none"> • Confined Livestock Area > 10 agricultural units^d • Seasonal feeding area • Solid Agricultural Waste Field Storage with >2 weeks storage time 	<ul style="list-style-type: none"> • Agricultural Waste Storage Facility • Chemical, compost, and woodwaste storage • Confined livestock area < 10 agricultural units^d • Incinerator • Mushroom barn • On-farm composting • On-farm soilless medium production and storage • Silo • Petroleum Storage 	<ul style="list-style-type: none"> • Brooder house • Hatchery • Fur farming shed • Livestock barn • Livestock Shelter • Milking facility • Stable 	<ul style="list-style-type: none"> • Boiler Room • Cidery • Cold Frame • Crop Storage • Detention Pond • Direct Farm Marketing • Granary • Greenhouse • Machinery Storage • On Farm Processing • On Farm Product Preparation • Retention Pond • Impervious Surfaces
Natural Streams Setbacks	30 m	15 m	15 m	15 m
Channelized Streams Setbacks	30 m	15 m	15 m	2 x channel width ^b Minimum of 10 m Maximum 15 m
Constructed Channels and Ditches Setbackse	30 m	15 m	5 m ^c	5 m ^c

Notes

- * Property safety and risk management concerns may require larger setbacks in some instances and will then override the setback standards shown here.
- a Setback distances are measured from the top of bank.
- b Channel width is determined from the top of bank to top of bank.
- c The minimum building setback distance from a constructed channel or constructed ditch which a municipality is responsible for maintaining is 7 metres.
- d One agriculture unit is equal to the live weight of 455 kg (1000 lbs) of livestock, poultry or farmed game or any combination equaling this weight.
- e There is no differentiation between constructed channels and constructed ditches for the purposes of building setbacks, only for drainage maintenance purposes.
- f The setback from a domestic water intake for all agricultural buildings is 30 m.

Farm Building Construction

Whether for livestock or storage purposes, good construction ensures both effective use and low environmental impact from farm structures. Farm building plans are available from Ministry of Agriculture. Figure 2.1, next page, shows a typical barn wall with environmentally sound construction. For siting, sanitation and waste handling, construct all agricultural buildings using the following beneficial practices:



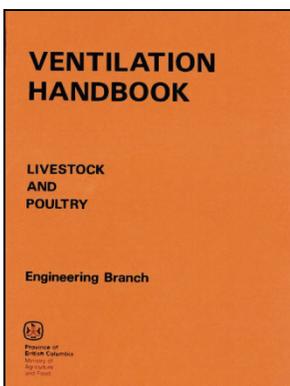
- ◆ if using off-farm wastes for fill material, ensure that they do not pollute
 - ◆ use building layouts that allow for effective and efficient cleanup
 - ◆ for storage buildings containing hazardous materials, ensure that impervious surfaces and continuous sills, even under doorways, are incorporated in construction for containment
 - ◆ collect and manage roof water when more than a suggested 10% of the site is roofed to avoid significant stormwater flow changes caused by impervious roofing
 - ◆ in high rainfall areas, incorporate eavestroughs to divert roof drainage
 - ◆ divert drainage away from buildings (requires perimeter drainage), watercourses and wells, and sources of contamination (e.g., manure, compost piles)
 - ◆ install gravel splash pads at the base of walls to control roof water erosion
 - ◆ if buildings have galvanized metal roofing, ensure the roof water (which could contain zinc levels toxic to fish) is directed away from watercourses
 - ◆ have the roof water infiltrate the soil to allow the soil to tie up the zinc
 - ◆ ensure that separate drainage systems are not cross-connected during construction
 - ◆ install back-flow prevention devices on all water supply lines used for medicated livestock watering, mixing pesticides, fertilizers or potentially harmful cleaning products
 - ◆ extend concrete foundation walls at least 300 mm (suggested) above grade line to discourage rodents and water from entering buildings
 - ◆ keep buildings in proper repair
-  **Canadian Farm Buildings Handbook**
 **Guidelines for Farm Practices Involving Fill**
 **National Farm Building Code of Canada 1995**

Building Drains. Buildings are often fitted with perimeter drains and downspouts to divert clean roof water away from the foundation. If a layout contains drains that collect contaminated water (e.g., manure), test that the drains are not cross connected (put a 'MOE-approved dye' such as a water fluorescein into the contaminated drains and check that it does not exit at a clean water outlet).

Building Ventilation. Ventilation systems remove dust, gases and odours from buildings. In buildings where dust and odour levels are high, hoods on sidewall exhaust fans direct discharges downward toward the ground. The use of chimney fans may also be beneficial. Install hoods, protective flaps or louvers on ventilation ports to prevent the entry of rain and snow as well as to ensure predictable exhaust rates. Vegetative filters surrounding buildings or located near discharge points may be effective in intercepting odour and dust laden exhaust.

➔ see Indoor Poultry and Livestock Housing, page 3-2, and refer to Vegetative Filters, ➔ see Buffers, page 11-4

 **Ventilation Handbook**



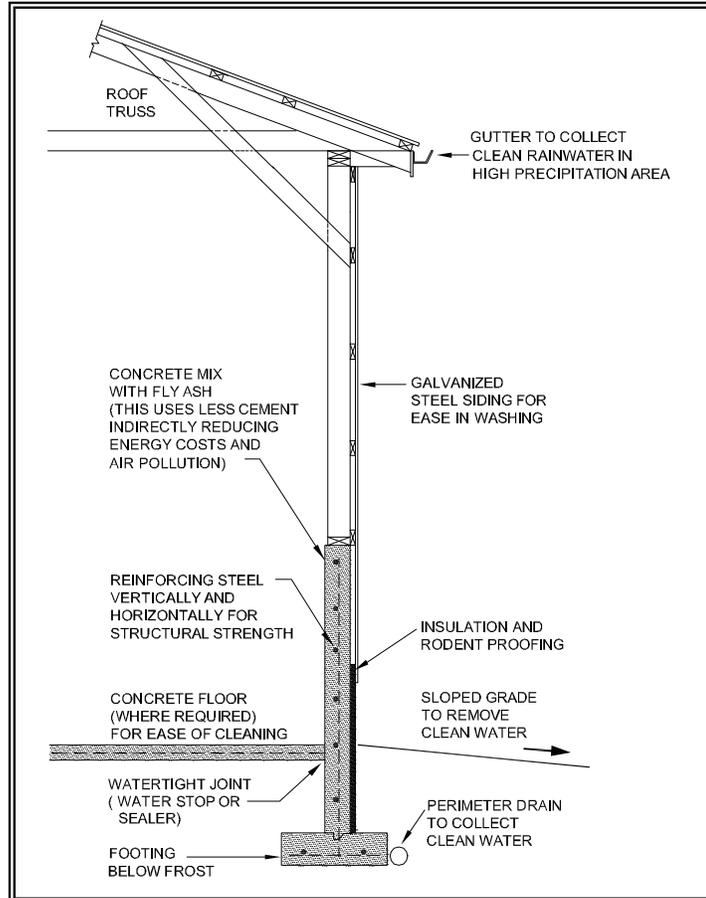


Figure 2.1 Environmentally Sound Building Construction

Leachate. Some buildings will have products stored or used that could be leached to ground water.

→ see Leachate, page 9-48

Water Supply. Some buildings will require water to be supplied to them.

→ see Water Supply, page 9-6

Farm Roads Farm roads to buildings or fields may affect the natural water flow from fields and surrounding areas thereby negatively impacting nearby watercourses. Implement the following practices to minimize the impact of roads to watercourses:

- ◆ locate culverts to allow for controlled drainage of runoff to reduce erosion
 - the risk of concentrated water flow causing soil erosion increases as the slope and length of a road increases
- ◆ construct roads to follow contours
 - the risk of soil erosion increases when roads are constructed along a slope rather than across a slope
 - except for short lengths, grades should not exceed 10 percent (suggested) i.e., 1 m fall for 10 m of road length
 - steeper grades may require water bars or frequent culvert installations
- ◆ transport materials such as manure and pesticides well back from watercourses in case accidental spills occur
- ◆ have all weather roads so emergency vehicles can access farm buildings

- ◆ construct permanent farm roads with compacted, well-drained gravel or other suitable material
 - keep hard-surface areas to a minimum to reduce surface runoff
 - limit woodwaste use on roads
 - see Woodwaste, page 2-27
 - if using off-farm wastes for road construction ensure they do not pollute (such as the use of broken concrete or ground asphalt would be acceptable)
- ◆ use dust suppression agents such as water and wetting agents, calcium chloride or lignosulfonates
 - used or waste oil is not allowed to be used as a dust suppressant

Buildings and Roads Near Water Farm buildings and roads, and the management of water can have impacts on surface water and groundwater if not managed properly.

Adjacent Watercourses. Watercourses and water used for domestic purposes are protected under various environmental laws.

- ◆ site and construct farm buildings and roads so as not to negatively impact fish and wildlife habitat, and water quality and quantity
- ◆ select areas that reduce or avoid the risk of water contamination by using sufficient setbacks, buffers, or berms
- ◆ do not allow runoff that contains manure, fertilizer, pesticide, or soil that is harmful to a fisheries resource to enter a watercourse
 - see Farm Building Siting, page 2-4,
 - see Buffers, page 11-4,
 - see Changes In and About a Stream, page 7-16,
 - and see Runoff, page 9-42

Runoff. Runoff is the overland flow of water (also known as stormwater), from rainfall, melting snow or excess irrigation. Control and collect all runoff that becomes contaminated on the farm. Runoff should also be prevented from running into potential sources of contamination (e.g., manure storages, compost piles, stored silage, feed bunkers, confined livestock areas) that could form leachate, or pick up nutrients and runoff into watercourses.

Land covered by farm structures (e.g., barns, greenhouses) or impermeable surfaces (e.g., roads, yards) reduces the capability of a site to allow precipitation to infiltrate. This results in increased water leaving the farm through drainage systems (surface channels, tiles and ditches) during peak rainfall periods. This increased peak flow has the potential to cause flooding and erosion leading to the discharge of unacceptable levels of suspended solids.

→ see Runoff, page 9-42

Ground Water. Determine soil permeability and ground water levels at construction sites. Environmental problems can be avoided by selecting a site with permeability characteristics suitable for controlling leaching into ground water.

→ see Leachate, page 9-48

Wells provide a pathway for contaminants to ground water either by direct entry, or by entry from outside the well along the well casing.

→ see Water Supply, page 9-6

Stream Crossings



Existing stream crossings should have approval from the appropriate agencies, such as Fisheries and Oceans Canada. Whenever a stream crossing is constructed or used for vehicles or livestock, it must not negatively impact fish, fish habitat, or other wildlife. Implement the following practices:

- ◆ all stream crossings should:
 - be approved by MOE and/or authorized by Fisheries and Oceans Canada
 - see Changes In and About a Stream, page 7-16
 - not damage fish habitat nor create blockages for fish passage (e.g. clear-span bridges are more “fish-friendly” than culverts)
 - 📖 **Bridge Construction (as it relates to constructed ditches)**
 - be at a right angle to stream flow and at the narrowest section possible
 - have stream culverts sized to allow for safe fish passage and to carry anticipated 100 year peak flow (suggested)
 - 📖 **Culvert Installation in Constructed Ditches**
- ◆ instream or bed-level crossings should
 - be approved by MOE and/or authorized by Fisheries and Oceans Canada
 - see Changes In and About a Stream, page 7-16
 - not restrict water flow and allow unrestricted fish passage
 - prevent and control sediment discharge into the stream
 - be managed to discourage livestock loitering in or near watercourses
- ◆ if water quality is impacted by vehicle or livestock crossing, install a hard surface (such as adding gravel or concrete to a silty stream bottom)

Land Clearing and Development

Land clearing and development has the potential to alter the quality and quantity of surface and ground water flows, quality of air, and fish and wildlife habitat. Care should be taken to plan any land clearing or development to minimize disruption of natural processes. Once disrupted, these important processes and habitats are difficult, expensive and often impossible to restore. Monitor and document impacts to help assess the need for change.

- see Chapter 7, Biodiversity,
- see Chapter 9, Water,
- see Chapter 10, Air,
- see Chapter 12, Climate Change

Adjacent Land Development

Neighbouring land uses may have a negative impact on agricultural operations. Incompatible uses may include both industrial and residential development. Select new farm production sites with such influences in mind. On existing sites, scheduling activities, such as manure spreading, to avoid times when outdoor recreational activities are occurring will minimize neighbourhood disputes. On occasions where timing conflicts cannot be avoided, open communication often helps to improve understanding and acceptance.

Odour Considerations

Odour emissions from intensive production facilities (e.g. livestock or mushroom) may have a negative impact if they are sited near populated or sensitive areas. When designing and siting production facilities it is important to consider the following when predicting the frequency and intensity of odours on surrounding areas and neighbours:

- ◆ site specific climate conditions (temperature, moisture, humidity, wind speed, wind direction, etc.)
- ◆ topography of the site

- ◆ management practices (manure storage and agitation practices, dust management, and manure spreading technologies)
 - ◆ the use of odour reducing tools (i.e. windbreaks, vegetative buffers, biofilters and bioscrubbers)
- See Odour, page 10-13

Treated Wood Products Treated wood is often used to prevent infestation by pests and to slow decay. Properly applied and cured water-based preservatives, such as chromated copper arsenic, do not present a significant leaching problem. Oil-based preservatives, such as creosote, leach out of wood more readily and may cause problems. Wood posts treated with registered preservatives are not considered "hazardous waste" under the *Hazardous Waste Regulation of the Environmental Management Act*. For treated wood disposal

→ see Farm Refuse Disposal, page 2-15

The pollution potential posed by treating wood or by using treated material can be minimized by implementing the following practices:

- ◆ avoid erecting posts in watercourses
- ◆ use old treated materials near watercourses – freshly treated materials are more likely to leach
- ◆ if wood is to be treated on the farm, ensure that mixing, treatment, and application sites are located far from watercourses and not susceptible to spills, leaching or runoff

Abandoned Farm Sites and Farmland Both the building sites and associated fields on farms that are no longer maintained, taken out of production or abandoned can become an environmental concern. Implement the following practices:

- ◆ ensure adequate control measures are in place to prevent pests and weeds from multiplying and affecting neighbouring farms
- ◆ remove feed sources to avoid attracting wildlife and rodents
- ◆ clean up all products that may cause pollution
- ◆ empty manure and fuel storage facilities
- ◆ properly dispose of pesticides and fertilizers

→ see Pesticide and Pesticide Container Disposal, page 5-22



This section discusses wastes generated on the farm but not addressed by the *Code* under the *Agricultural Waste Control Regulation*. This includes onsite sewage wastes and refuse but not manure, crop residues or mushroom media.

FARM WASTE ENVIRONMENTAL CONCERNS

Primary environmental concerns related to farm wastes are:

- ◆ septic absorption field failure that results in pollution of water
- ◆ materials and leachate released from on-farm refuse disposal sites that results in air or water pollution, or in attraction of wildlife

For information on these concerns:

- see Impacts on Biodiversity and Habitat, page 7-8, refer to Farm Activities and Impacts
- see Soil Quality Factors, page 8-2, refer to Contaminants
- see Water Quality and Quantity Factors, page 9-2, refer to Contaminants, and to Solids

FARM WASTE LEGISLATION

The following is a brief outline of the main legislation that applies to farm wastes.

- see page A-1 for a summary of these and other Acts and Regulations



Agricultural Land Commission Act

This Act requires approval from the Agricultural Land Commission to utilize non-agricultural wastes on land within the Agricultural Land Reserve.



Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system



Environmental Management Act

This Act regulates all wastes disposed from farm and farm house operations.

- ◆ Sections 14 and 15: allow for the authorization of waste discharges, including household and other general refuse, to a site, such as an approved landfill

Note that the *Code* under the *Agricultural Waste Control Regulation* provides for exemption from Section 6(2) and (3) of the Act **only** for defined agricultural wastes (manure, used mushroom medium and vegetation waste).

The Hazardous Waste Regulation, the Waste Discharge Regulation and the Open Burning Smoke Control Regulation have disposal provisions for specific wastes.



Public Health Act

This Act prohibits activities that may cause a health hazard:

- ◆ Section 15: a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard

The Act also has conditions under the Public Health Act Transitional Regulation:

- ◆ Section 18: separation distance of wells to be at least 30.5 m from any probable source of contamination (probable source of contamination could be septic absorption sites)

The *Sewerage System Regulation* requires domestic sewage be discharged into a public sewer or an approved sewage disposal system. Only authorized persons may construct and maintain systems. The owner is responsible to have maintenance done and to keep records.

- ◆ Section 3.1 requires separations distances from wells (as outlined in the  **Sewerage System Standard Practice Manual**) to be at least:
 - 15 m from a holding tank
 - 30 m from a sewerage system



Fisheries Act

This Act has two sections of importance to farm waste management:

- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include septic waste)
- ◆ Section 37: requires approval for any work that may impact fish
- ◆ Section 38(4): requires reporting infractions of Section 36

FARM WASTE BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable farm waste related legislation, including the above, and where appropriate, implement the following beneficial management practices to protect the environment.

Farm Sewerage Systems

Siting and Construction. Construction of domestic sewerage systems from farm residences, barns and other structures are regulated by the Ministry of Health Services including septic tanks, adsorption fields and residential lagoon systems. All new and existing systems must function so as not to create a health hazard. Registered Onsite Wastewater Practitioners must be consulted if repairs or new construction are anticipated.

Separation from wells must be at least:

- ◆ 15 m from a holding tank (*Public Health Act*)
- ◆ 30 m from a sewerage system (*Public Health Act*)

Maintenance. Efficient operation of the disposal system depends primarily on maintenance of the septic tank. Periodically remove solids that accumulate in the tank to prevent them from reaching the field and causing system failure. Owners are required to maintain sewerage systems (including solids removal from the tank) according to maintenance plans as determined by a qualified professional.

-  **Septic System Maintenance Pure & Simple**
-  **Sewerage System Standard Practice Manual**

Outhouses. Outhouses or pit toilets can cause an environmental or health hazard if improperly constructed or sited. Check with the local health authority to determine what standards or guidelines for outhouses exist in the region.

Farm Refuse Disposal Sites

Implement the following practices for approved on-farm disposal sites:

- ◆ **do not** locate the site
 - on sandy or gravelly soils or in gullies
 - in areas of high ground water or on a flood plain
- ◆ **do** locate the site
 - at least 122 m from any well (*Public Health Act*) and down slope of any well
 - 30 m or more (suggested) from any watercourse
- ◆ **do** manage the site to
 - protect watercourses and ground water
 - avoid wildlife attraction and wind dispersal (bury and cover wastes)
 - separate livestock mortalities (use a different site)
- ◆ record locations, amount, and type of material in on-farm disposal sites

Farm Refuse Disposal

Material Disposal. When purchasing, consider products that contribute to a lower impact on the environment during production, packaging, marketing and shipping. Also consider products that can be reused or recycled.

When disposing of farm waste, use permitted landfills or where they are available, waste disposal services. Untreated wood products may be reused or burnt; paint can be returned to a Product Care Depot.

 <http://www.productcare.org/>

Plastics Disposal. Plastic wastes are not exempted by the *Code* under the *Agricultural Waste Control Regulation*, and disposal practices must therefore comply with the *Environmental Management Act*. Wherever possible, reuse or return all waste plastics to depots for recycling. The Recycling Council of BC has a hotline to answer questions about recycling in BC 1-800-667-4321.

Properly dispose of plastics that have contained or contacted toxic materials.

➔ see Pesticide Container Disposal, page 5-22

Implement the following practices for waste plastics:

- ◆ reuse plastics where possible
 - reuse plant pots and bedding containers (thoroughly clean and disinfect to avoid plant disease transfer)
 - replace non-recyclable or difficult to remove plastic products such as plant clips and twine with biodegradable materials
 - use refillable containers

- clean and reuse waste sheet plastic for other purposes, such as coverings
- ◆ recycle plastics where possible
 - grind up waste polystyrene for use as a potting soil amendment
 - separate plastic products from plant debris and clean before recycling or taking to an approved landfill
 - use a roller or baler to compress waste plastics into smaller volumes for easier handling
 - encourage suppliers to accept the return of waste plastics
- ◆ if recycling or reusing plastics is not an option
 - the preferred method is to burn products in a high-temperature incinerator, such as a municipal incinerator – **do not burn on-farm due to the release of hazardous gases**
 - see Open Burning, page 10-17
 - an alternative disposal method is to use an approved landfill – **do not bury plastics on farm property**

Treated Wood Disposal. Implement the following practices for disposal of treated wood material, such as pallets, boards, or posts (note that waste wood products treated with registered wood preservatives are not "hazardous waste" under the *Hazardous Waste Regulation* of the *Environmental Management Act*):

- ◆ reuse treated wood products for other applications such as landscape construction
- ◆ dispose of treated wood products at an approved landfill
- ◆ obtain an authorization permit from MOE to bury the material on farm property

DO NOT burn treated wood materials on the farm. High-temperature burning at an approved incineration facility is the only environmentally safe way to burn such materials. To reduce the use of treated wood products, investigate alternatives such as metal, concrete, or recycled plastic posts.

→ see Treated Wood Products, page 2-12

Machinery and Equipment Disposal. When possible reuse or recycle machinery components; otherwise dispose of such products to recyclers. If spent machinery remains on the property, remove potential damaging fluids (e.g., refrigerants, oils, fuels, antifreeze) and safely dispose. Send batteries, tires and oils to collection depots for recycling.

Metal Disposal. Most suppliers of commercial products stored in metal drums and cans accept the return of these containers. Recycling options also currently exist for most types of metal containers. An alternative disposal method is to use an approved landfill – **do not bury metal on farm property.**

Rockwool Disposal. Rockwool is an inert, non-polluting, non-degradable soilless medium manufactured from lava rock for use in greenhouse and nursery production. Implement the following beneficial management practices:

- ◆ reuse rockwool where possible
- ◆ rotate crops to reduce or eliminate the risk of pathogens – rockwool slabs can function effectively for three to four years without replacement if handled carefully and if sterilized between crops
- ◆ recycle rockwool where possible

- ◆ do not store product for long periods or in anticipation of recycling
- ◆ where rockwool is disposed of use an approved landfill – **do not bury rockwool on farm property**
- ◆ in some cases, rockwool may be used as a soil amendment to improve soil structure and to allow any residual nutrients to be taken up by crops
 - consult MOE if use of rockwool as a soil amendment is being considered

Ash Disposal. Ash from auxiliary fuel fired refuse incinerators that serve industrial, recreational or camp operations in remote areas can be land filled or used as a soil conditioner on farms or ranches.

- ◆ contact MOE to see if this type of ash disposal or use is appropriate

Animal Health Care Products Disposal

The use of medication in livestock production is common practice. Dispose of spent medicines, empty containers and other medical items in an acceptable manner. Implement the following practices:

- ◆ consult your veterinarian about the proper and safe disposal of spent medicines
- ◆ package medical waste equipment that has the potential to puncture within a rigid container, and discard with household waste if permitted
- ◆ follow suppliers' or manufacturers' instructions for disposal of syringes, medications, outdated medical supplies and other items
- ◆ contact MOE when disposal quantities are in excess of 5 kg or 5 litres

CHEMICAL FERTILIZER



CHEMICAL FERTILIZER ENVIRONMENTAL CONCERNS

Primary environmental concerns related to chemical fertilizer are:

- ◆ fertilizer receiving, storing and dispensing where
 - spills or fires result in soil, water or air pollution
 - gas emissions result in air pollution
 - leachates result in water pollution
- see Chapter 6, Soil Amendments, for information on fertilizer use

For information on these concerns:

- see Impacts on Biodiversity and Habitat, page 7-8, refer to Farm Activities and Impacts
- see Soil Quality Factors, page 8-2, refer to Contaminants
- see Water Quality and Quantity Factors, page 9-2, refer to Contaminants
- see Air Quality Factors, page 10-1, refer to Contaminants

CHEMICAL FERTILIZER LEGISLATION

The following is a brief outline of the main legislation that applies to chemical fertilizers.

- see page A-1 for a summary of these and other Acts and Regulations



Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system



Environmental Management Act

The *Spill Reporting Regulation* requires spills of a polluting substance be reported immediately to the Provincial Emergency Program (PEP) at 1-800-663-3456 (24 hour service). Report spills of fertilizer greater than 50 kg or 50 litres.



Public Health Act

This Act prohibits activities that may cause a health hazard:

- ◆ Section 11: requires the reporting of any health hazard to a prescribed person (a health hazard may be the escape of petroleum products)
 - a prescribed person may be described by Regulations under the Act

- ◆ Section 15: a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard

The Act also has conditions under the Public Health Act Transitional Regulation:

- ◆ Section 18: separation distance of wells to be at least 30.5 m from any probable source of contamination (probable source of contamination could include fertilizers)



Fisheries Act This Act has two sections of importance to fertilizer handling and storage:

- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include fertilizers)
- ◆ Section 38(4): requires reporting infractions of Section 36

CHEMICAL FERTILIZER BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable chemical fertilizer related legislation, including the above, and where appropriate, implement the following beneficial management practices to protect the environment.

→ see Chapter 6, Soil Amendments, for information on fertilizer use

Chemical Fertilizer Handling, Storage and Disposal

When handling, storing and disposing of chemical fertilizers implement the following practices:

- ◆ locate away from yard drain inlets, ditches, wells and watercourses
 - at least 30.5 m from wells (*Public Health Act*)
 - to meet the Agriculture Building Setback Standards (suggested)
- see Farm Building Siting, page 2-4
- 30 m or more from a water intake used for domestic purposes (suggested)
- ◆ locate handling and storage areas above the 100-year flood level (suggested)
- ◆ clean up fertilizer spills as soon as possible

Dry fertilizer is very soluble and should be stored under cover to prevent any water contact. Liquid fertilizers should be stored in watertight containers with secondary containment. Check storage tanks for both liquid and gaseous fertilizers every day for leaks. Liquid and gaseous storage tanks should be protected from collision.

In the event of anhydrous ammonia leak, the tank and surrounding area should be showered with water. This water should be prevented from entering a watercourse as it will contain ammonia.

Store chemical fertilizers, pesticides and fuel in separate facilities to avoid cross-contamination and unpredictable chemical reactions. Keep oxidizing fertilizers (e.g., ammonium nitrate) away from any fuel or source of open flame or spark. Buy only the amounts you need to avoid storing large amounts of fertilizer. If you must store fertilizers for longer periods of time, size facilities appropriately. Construct a storage facility such that it can be locked and have an impermeable floor with leachate and spill collection. Clearly label all containers.

Implement the following practices for unwanted, unused, old, wrongly formulated, or spoiled fertilizer:

- ◆ do not bury unwanted or spilled fertilizers on your property
- ◆ spread unused product on alternative sites or crops in amounts that ensure efficient nutrient utilization
- ◆ add small amounts to materials that are to be composted

Chemical Fertilizer Spills

Fertilizer spills larger than 50 kg or 50 litres must be reported in accordance with the *Spill Reporting Regulation*. If a fertilizer spill occurs implement the following practices:

- ◆ use berms or containment to prevent spread
- ◆ clean up sites by removing both fertilizer and soil that contains excess nutrients and manage the same as liquid or solid fertilizer

Reporting Requirement

Under the *Spill Reporting Regulation*, fertilizer spills larger than 50kg or 50 litres must be reported immediately to the Provincial Emergency Program (PEP) at 1-800-663-3456 (24hr service).

Chemical Fertilizer Contingency Plan

Develop a contingency plan when storing any amount of fertilizer. The plan should provide a timely and effective response to emergencies involving the unexpected release of fertilizer products into the environment, from:

- ◆ accidental spills, such as when transporting, storing, dispensing or applying
- ◆ release due to building fires or natural events, such as forest fires, floods, or earthquakes
- ◆ release due to vandalism
- ◆ application errors, such as applying too much fertilizer

 **Contingency Plan - Template for On-Farm Planning**

PETROLEUM



PETROLEUM ENVIRONMENTAL CONCERNS

Primary environmental concerns related to petroleum are:

- ◆ receiving, storing, dispensing and using petroleum products where spills or fires result in soil, water, air or habitat pollution
- ◆ gas emissions from storage that result in air pollution
- ◆ disposal of used oils that results in soil, water, air or habitat pollution
- ◆ internal combustion engine-driven pumps that result in water pollution

For information on these concerns:

- see Impacts on Biodiversity and Habitat, page 7-8, refer to Farm Activities and Impacts
- see Soil Quality Factors, page 8-2, refer to Contaminants, and to Micronutrients and Metals
- see Water Quality and Quantity Factors, page 9-2, refer to Contaminants, and to Micronutrients and Metals
- see Air Quality Factors, page 10-1, refer to Contaminants

PETROLEUM LEGISLATION

The following is a brief outline of the main legislation that applies to petroleum products.

- see page A-1 for a summary of these and other Acts and Regulations

Local Bylaws The National Farm Building Code 1995 outlines standards for above ground fuel tanks storing more than 100 litres and **is enforced only where proclaimed by local government.**

- ◆ Section 3.1.4: requires equipment being fuelled and the above ground fuel storage tanks be at least 12 m from any other building or property line. Fuel storages must be located outdoors or in buildings used only for the purpose of fuel storage.



Drinking Water Protection Act This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system

The *Spill Reporting Regulation* requires spills of a polluting substance be reported immediately to the Provincial Emergency Program (PEP) at 1-800-663-3456 (24 hour service). Report spills of petroleum or lubricants greater 100 litres.

Under the *Hazardous Waste Regulation* waste oil cannot be applied to land for the purpose of dust suppression.



Public Health Act

This Act prohibits activities that may cause a health hazard:

- ◆ Section 11: requires the reporting of any health hazard to a prescribed person (a health hazard may be the escape of toxic substances)
 - a prescribed person may be described by Regulations under the Act
- ◆ Section 15: a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard



Environmental Management Act

This Act also has conditions under the Public Health Act Transitional Regulation:

- ◆ Section 18: separation distance from wells to be at least 30.5 m from any probable source of contamination (probable source of contamination could include petroleum products)



Fisheries Act

This Act has two sections of importance to petroleum management:

- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include petroleum products)
- ◆ Section 38(4): requires reporting infractions of Section 36



Migratory Birds Convention Act

This Act prohibits the deposit of oil or waste oil onto any area frequented by migratory birds.

PETROLEUM BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable petroleum related legislation, including the above and where appropriate, implement the following beneficial management practices to protect the environment.

Petroleum Storage



Mobile Fuel Storage. Jerry cans, drums and truck-box fuel tanks are commonly used in farm operations. Implement the following practices:

- ◆ do not fill beyond their safe filling level
- ◆ keep drums upright and secure during transport
- ◆ avoid dispensing from horizontal drums
- ◆ have secondary containment for truck box fuel tanks that are removed from the truck or trailer and operated in a fixed location for any length of time
- ◆ carry a fuel spill cleanup kit

Stationary Fuel Storage. Implement the following practices for all tanks (refer to Figure 2.2, next page, for aboveground tank illustration):

- ◆ locate tanks away from yard drain inlets, ditches, wells and watercourses
 - at least 30.5 m from wells (*Public Health Act*)

- to meet the Agriculture Building Setback Standards (suggested)
→ see Farm Building Siting, page 2-4
- 30 m or more from a water intake used for domestic purposes (suggested)
- ◆ support tanks on non-combustible material (e.g., metal)
- ◆ construct storage tanks in accordance with accepted engineering practices
- ◆ size spill containment to hold a single tank's volume plus 10%, or, for multiple tanks, the largest tank's volume plus 10%
- ◆ use an anti-siphoning device in tank discharge lines or self-closing nozzles
- ◆ ensure no drips, leaks or overflow occurs when receiving or dispensing fuel
- ◆ use bumper guards to protect tanks from direct collision by vehicles
- ◆ ensure that a fuel spill cleanup kit is readily available

MOE recommends that underground fuel storage tanks have:

- ◆ secondary containment for all tanks and piping (i.e., double-wall)
- ◆ corrosion protection for all steel tanks and piping
- ◆ a leak detection system
- ◆ an overfill protection device for the tank
- ◆ a self-closing nozzle on the dispensing line

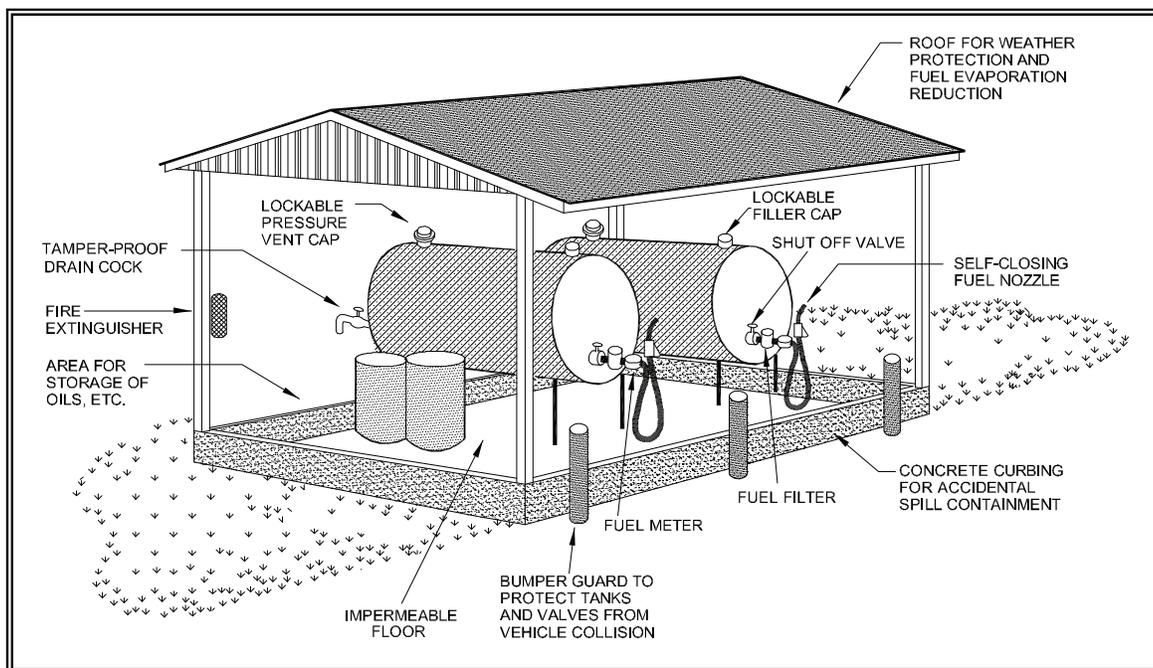


Figure 2.2 A Well-Planned Above Ground Fuel Storage Facility

VOC Emission Reduction from Fuel Evaporation

Fuel evaporation during storage results in volatile organic compound (VOC) emissions and is an environmental concern. Evaporation from aboveground tanks is due to heating of the tank by the sun which causes the fuel to volatilize and vent to the atmosphere. Underground tanks have lower evaporation losses. Implement the following beneficial management practices to reduce the release of VOCs into the atmosphere:

- ◆ construct an improved fuel storage facility
- ◆ dispose of used or unwanted petroleum in a timely manner

- ◆ minimize fuel evaporation from fuel storage, refer to Table 10.2, next page:
 - paint fuel storage a light colour (e.g. white or silver)
 - build fuel storage tanks below ground
 - when possible shade tanks or build a covered storage facility
- ◆ contain gases by using a pressure release valve vent cap that allows tank pressure to build up slightly before emissions are released
- ◆ to estimate fuel losses from fuel storage refer to  **Farm Storage and Handling of Petroleum Products**

 http://www.env.gov.bc.ca/epd/industrial/oil_gas/pdf/fuel_handle_guide.pdf

→ see Petroleum Storage, page 2-22

Used Oil Disposal When installing or retrofitting fuel storage facilities follow the fuel loss beneficial management practices that are outlined in Table 2.2. Improper disposal of spent or used oils can cause an environmental concern. The best alternative is to return oil to an approved recycling centre. Under the *Environmental Management Act*, all vendors of petroleum products are required to accept the return of waste oil from customers. Safely recover and store waste petroleum products and return them periodically to the supplier or a depot for recycling. Do not apply used oil to roads for dust suppression (*Hazardous Waste Regulation*).

→ see Farm Roads, page 2-9

Table 2.2 FUEL LOSS BENEFICIAL MANAGEMENT PRACTICES

	<p>1. Paint the Tank.</p> <p>The use of reflective paint (white or silver) will reduce losses by up to 40% over a dark tank. A coat of paint will also reduce rusting of the tank.</p>
	<p>2. Use a Pressure Vent Cap.</p> <p>Direct venting of the tank fumes are restricted until a slight pressure has built up in the tank. Losses are reduced further by 50%. A painted and pressure-vented tank has 75% less evaporation losses than a dark tank. These two improvements should be considered standard for all farm fuel tanks, especially gasoline storage tanks.</p>
	<p>3. Shade the Tank.</p> <p>A painted and pressure-vented tank in the shade further reduces losses by over 40%. A simple roof over the tank will provide complete shading. The cover will also reduce weathering of hoses and valves, provide storage for lubricants and solvents and provide cover from the weather while refuelling.</p>
	<p>4. Use a Double-walled Tank.</p> <p>While more expensive than other tanks, when replacing a tank, consider a double-walled tank for spill containment and reduced evaporation losses</p>

Petroleum Spills Be prepared to handle spills by having a petroleum spill cleanup kit when transporting, storing or dispensing fuels. Such a kit includes containers for contaminated waste and absorbent materials such as clay, kitty litter or sawdust and a means, such as shovel, to collect contaminated material.

Report any petroleum spill to the nearest Medical Health Officer located at the nearest Regional Health Unit, as required by the *Public Health Act*.

Reporting Requirement

Under the *Spill Reporting Regulation*, petroleum spills over 100 litres must be reported immediately to the Provincial Emergency Program (PEP) at 1-800-663-3456 (24hr service).

. Contact the Pollution Prevention Program of the regional MOE office for assistance in remediation or disposal options regardless of the extent of the contamination.

Petroleum spills of less than 100 litres do not require reporting but do need to be managed to minimize environmental impacts. If a petroleum spill can be contained and there is no danger of the spilled product leaching into a watercourse, the contaminated soil may remain in place or be moved to a safer area and spread. Soil microbes will break down the petroleum product and decontaminate the soil over time (i.e., bioremediation).

If a spill takes place in a public area such as a highway, call the local police and contact the 24-hour Provincial Emergency Program at **1-800-663-3456**.

Stationary Engines. Internal combustion engines located near watercourses create a potential for contamination. To minimize this possibility, use secondary containment for the engine and its fuel tank, such as a metal pan large enough to capture fuel spills from the fuel system.

Note: small quantities of petroleum products can cause extensive water pollution.

Petroleum Contingency Plan

Develop a contingency plan when storing quantities of petroleum products. The plan should provide a timely and effective response to emergencies involving the release of petroleum products into the environment, from

- ◆ accidental spills, such as when transporting, storing, applying or dispensing
- ◆ release due to building fires or natural events, such as forest fires, floods, or earthquakes
- ◆ release due to vandalism

 **Contingency Plan - Template for On-Farm Planning**

WOODWASTE



For the purpose of this publication, the definition of woodwaste is the one given in the *Code* under the *Agricultural Waste Control Regulation*:

- ◆ woodwaste **includes** hog fuel, mill ends, wood chips, bark and sawdust;
- ◆ it **does not include** demolition waste, construction waste, tree stumps, branches, logs or log ends; these are considered industrial wastes in legislation

WOODWASTE ENVIRONMENTAL CONCERNS

The environmental hazards associated with the use and storage of woodwaste are easily overlooked as wood is a natural material. The process of woodwaste decay accelerates significantly when wood is ground or chipped.

Primary environmental concerns related to woodwaste are:

- ◆ the handling and use of woodwaste where direct deposit into watercourses results in pollution of water or habitat loss; or application onto soil results in pollution of the soil; or storage results in pollution of air
- ◆ the formation of woodwaste leachate that enters watercourses or domestic water sources and results in pollution of water and fish kills

For information on these concerns:

- ➔ see Impacts on Biodiversity and Habitat, page 7-8, refer to Farm Activities and Impacts
- ➔ see Soil Quality Factors, page 8-2, refer to Carbon-to-Nitrogen Ratio, to Contaminants, and to pH
- ➔ see Water Quality and Quantity Factors, page 9-2, refer to Contaminants, and to Micronutrients and Metals
- ➔ see Air Quality Factors, page 10-1, refer to Dust and Particulates, and to Open Burning

WOODWASTE LEGISLATION

The following is a brief outline of the main legislation that applies to woodwaste.

- ➔ see page A-1 for a summary of these and other Acts and Regulations



Agricultural Land Commission Act

The *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* allows the placement of soil conditioners necessary for farming on land in the Agricultural Land Reserve. Fill, necessary for farm uses of land, may be applied to land subject to some restrictions. Fill that is applied to land in the Agricultural Land Reserve that is for any purpose other than farm use requires approval.



Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system



Environmental Management Act

This Act has three Regulations which cover woodwaste on farms.

The Code under the Agriculture Waste Control Regulation has requirements:

- ◆ Section 20: woodwaste may only be used
 - as plant mulch, soil conditioner, ground cover, on-farm access ways, livestock bedding and areas where livestock, poultry or farmed game are confined or exercised
 - as berms in cranberry production
 - as fuel for wood-fired boilers
- ◆ Section 21: woodwaste must be stored and handled so as to prevent escape of:
 - particulate or solid matter into the air
 - particulate or solid matter or leachate into any watercourse or ground water that cause pollution
- ◆ Section 22: woodwaste must not be used for landfill or on sites within 30 m of any source of water used for domestic purposes

The *Antisapstain Chemical Waste Control Regulation* prohibits the use of woodwaste containing antisapstain chemicals from being used as mulch or as fuel in wood-burning appliances.

The *Code of Practice for Soil Amendments* regulates the storage, application and use of industrial residues of wood (as defined).

- ◆ Section 8: If more than 5m³ of soil amendments are to be applied to a site in a year, before applying the soil amendment, the discharger must have a land application plan

The *Waste Discharge Regulation* exempts the use of industrial wood residue as a soil conditioner or ground cover in non-agricultural operations from Sections 6(2) and 6(3) of the *Act* under certain conditions. The Regulation allows the use of wood residue:

- ◆ Section 3(5):
 - as a plant mulch or in residential gardens
 - as foundation material for animal bedding
 - as sports areas (such as riding arenas)



Public Health Act

This Act has conditions under the Public Health Transitional Regulation:

- ◆ Section 18: separation distance from wells to be at least 30.5 m from any probable source of contamination (probable source of contamination could include woodwaste leachate)



Fisheries Act

This Act has four sections of importance to woodwaste management:

- ◆ Section 35: prohibits harmful alteration, disruption or destruction of fish habitat unless authorized
- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include woodwaste and woodwaste leachate)
- ◆ Section 37: requires approval for any work that may impact fish
- ◆ Section 38(4): requires reporting infractions of Sections 35 or 36

WOODWASTE BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable woodwaste related legislation, including the above, and where appropriate, use the following beneficial management practices to protect the environment.

Woodwaste Storage

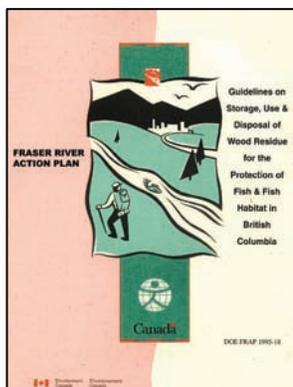
When storing woodwaste implement the following practices:

- ◆ locate storage area away from drain inlets, ditches, wells and watercourses
 - at least 30.5 m from wells (*Public Health Act*)
 - to meet the Agriculture Building Setback Standards (suggested)
→ see Farm Building Siting, page 2-4
 - 30 m or more from a water intake used for domestic purposes (suggested)
- ◆ store to prevent leachate entering surface or ground water by
 - covering piles to reduce leachate (in high precipitation areas, cover woodwaste between October 1st and April 1st)
 - using impermeable surfaces to prevent leaching into soil and groundwater
 - collect or contain leachate with berms
- ◆ use appropriate construction or adequate buffer to keep woodwaste from blowing onto watercourses and neighbours → see Buffers, page 11-4

Woodwaste Use

Appropriate agricultural uses of woodwaste are restricted to plant mulch, animal bedding, groundcover, farm access ways and fuel for boilers. When using woodwaste, implement the following practices:

- ◆ do not place directly into surface water
- ◆ use adequate buffers between areas receiving woodwaste and watercourses to prevent leachate contamination → see Buffers, page 11-4
- ◆ do not apply woodwaste to a depth of greater than 15 cm per year in outdoor areas (suggested)
- ◆ limit the total depth of woodwaste applied outdoors to no greater than 30 cm total (suggested)
- ◆ do not use woodwaste that may contain antisapstain chemicals, wood preservatives, or fire retardation chemicals
 - woodwaste containing these chemicals can affect livestock, wildlife and fish that come into contact with the treated woodwaste or leachate
- ◆ to reduce the risk of causing pollution, utilize sawdust from weathered woodwaste or from less toxic softwood tree species such as spruce, pine or fir, or from hardwoods
 - avoid using the bark of softwood trees, wherever possible, since they contain more resinous ingredients than heartwoods or sapwoods (resinous ingredients have a higher risk of producing toxic leachate)



- use weathered woodwaste with low bark content near sensitive areas (the production of leachate declines as woodwaste ages)
- ◆ apply only to soils having a carbon-nitrogen ratio (C:N) of 30:1 or lower
- ◆ do not shred woodwaste unless necessary (shredding increases surface area, resulting in more rapid decomposition, generating more toxic leachate)
- ◆ collect all leachate that poses the potential to pollute surface water or ground water → see Woodwaste Leachate Control, page 2-31
- ◆ use alternative materials where polluting woodwaste leachate cannot be collected

 **Woodwaste Use in Agriculture**

 **Woodwaste Use - Precautions to Horse Owners**

 **Guidelines on Storage, Use & Disposal of Wood Residue for the Protection of Fish & Fish Habitat in British Columbia**

Livestock Bedding. Sawdust and shavings can be excellent wood-based beddings. Implement the following additional practice:

- ◆ monitor the Carbon-to-Nitrogen ratio (C:N) of soil receiving bedding (repeated applications of bedding may result in a C:N shift that could reduce crop growth in time)

Drainage Systems. Implement the following additional practice:

- ◆ do not use woodwaste as a substitute for drain rock around drainage piping

Riding Arenas and Turnout Paddocks. Implement the following additional practices:

- ◆ ensure that drainage systems under woodwaste riding arenas and turnout paddocks do not discharge into any ditch, creek, stream, or pond
- ◆ do not use woodwaste as landfill to level a site (apply clean fill for levelling purposes before laying down any woodwaste)
- ◆ use alternative footing materials, such as sand, if the woodwaste stipulations within the *Code* under the *Agricultural Waste Control Regulation* cannot be met

Crop Mulches. Implement the following additional practices:

- ◆ minimize the depth and width of mulch around plants
- ◆ limit the application of woodwaste mulches in combination with nitrogen application to prevent crop “burning” and nutrient loss as woodwaste begins to degrade
- ◆ do not irrigate with water containing woodwaste leachate if the water contacts the crop
- ◆ use other materials such as compost or clean chopped straw if runoff or drainage containing woodwaste leachate cannot be handled in an environmentally sound manner

On-Farm Access Ways. Implement the following additional practices:

- ◆ do not use woodwaste simply as a fill material
- ◆ use other products, such as geotextiles with gravel and sand on roadways, if runoff or drainage containing woodwaste leachate cannot be handled in an environmentally sound manner

Cranberry Berms. Implement the following additional practices:

- ◆ do not allow woodwaste on the outside face of external cranberry bog berms to be in direct contact with drainage ditch water
- ◆ cap the top of all berms with an impermeable soil material to reduce leaching of woodwaste
- ◆ where possible, use alternative materials, such as gravel and/or geotextiles

Nursery Bedding Material. Implement the following additional practice:

- ◆ for the preparation of nursery beds, use geotextile fabrics either alone or in combination with sand and gravel as alternatives to woodwaste

Fuel for Boilers. The *Code* under the *Agricultural Waste Control Regulation* has requirements for using wood as a fuel for boilers.

→ see Heat Production and Agricultural Boilers, page 2-39

Open Burning. Before burning woodwaste material, ensure that alternative end uses such as bedding, mulch material, or compost feedstock has been considered.

→ see Open Burning, page 10-17

Woodwaste Leachate Control

Woodwaste leachate is generated by water moving through woodwaste and is characterized by a dark colour, "oily" sheen and a foul odour. Varying amounts of leachate are produced in almost all situations where woodwaste is used. Areas of the province with higher precipitation are more prone to leachate generation. Irrigation has a similar effect. Surface runoff from woodwaste can carry toxic leachate to adjacent fish-bearing streams or to ditch water that enters fish-bearing watercourses. Prevent leachate from entering watercourses or domestic water supplies.



The impacts of woodwaste on the environment will be minimized when it is used on well-drained upland sites with medium-textured soils and a deep water table. Leachate detoxification occurs at sites by natural attenuation in the soil. Fine-textured soils have a high ability to attenuate leachate, but restricted infiltration may reduce the amount of attenuation since more runoff is likely to occur. On rapidly drained sites with coarse-textured soils, limit the amounts of woodwaste to account for the sites lower absorption and degradation capacity. On poorly drained sites where the water table is near the surface, some form of drainage system may be needed to collect and treat leachate.

→ see Contaminant Movement in Soil, page 8-15

Limiting Leachate. Limiting use of woodwaste to only that which is absolutely necessary reduces leachate production. Limit contact time between leaching waters and woodwaste. Reducing the thickness of applied woodwaste, covering stored woodwaste, and diversion of uncontaminated runoff to prevent infiltration are all effective means of reducing leachate production.

Leachate Collection, Treatment and Use.

→ see Leachate, page 9-50 for collection and treatment and use.



COMPOST ENVIRONMENTAL CONCERNS

Primary environmental concerns related to compost are:

- ◆ storing, handling and processing raw materials that results in soil, water or air pollution
- ◆ disposal of leachate that results in soil, water or air pollution
- ◆ odour, particulate and gas emissions from composting that results in air pollution
 - see Chapter 6, Soil Amendments, regarding compost application to land

For information on these concerns:

- see Soil Quality Factors, page 8-2, refer to Contaminants
- see Water Quality and Quantity Factors, page 9-2, refer to Contaminants, and to Oxygen Demand
- see Air Quality Factors, page 10-1, refer to Contaminants, to Dust and Particulates, and to Odours

COMPOST LEGISLATION

The following is a brief outline of the main legislation that applies to composting.

- see page A-1 for a summary of these and other Acts and Regulations

Local Bylaws Many local governments enforce specific bylaws that place restrictions on composting.



Agricultural Land Commission Act

The *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* allows the production, storage and application of compost from agricultural wastes produced on the farm for farm purposes if at least 50% of the compost measured by volume is used on the farm.



Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system



Environmental Management Act

This Act has three Regulations that address composting on farms.

The *Code* under the *Agricultural Waste Control Regulation* specifies acceptable agricultural composting activities.

- ◆ Section 3: agricultural wastes must be collected, stored, handled, used and disposed of in a manner that prevents pollution
- ◆ Section 15: agricultural waste may only be composted on the farm
 - if the agricultural waste consists only of waste produced on the farm, or if produced elsewhere, is being composted for use on the farm
 - the composting site must be located at least 15 m from any watercourse and at least 30 m from any source of water for domestic purposes
 - must be composted in a manner that does not cause pollution
- ◆ Section 16: composting agricultural waste for the production of mushroom media on a farm is allowed
 - if the mushroom medium produced is used only on that farm
 - if the composting site is located at least 15 m from any watercourse; at least 30 m from any source of water for domestic purposes
 - if media is composted in a manner that does not cause pollution
- ◆ Section 19: states that the *Code* is not intended to prohibit various odours from agricultural operations or activities on a farm, providing such operations or activities do not pollute (Note: a Provincial Court of BC judgement found odours that cause or are capable of causing material physical discomfort to a person are considered emissions that cause pollution – odours not causing pollution may still be a nuisance to neighbours)
- ◆ Section 30: agricultural products must be managed to prevent the escape of agricultural wastes (agricultural products include farm inputs and outputs)

The *Organic Matter Recycling Regulation* has requirements related to the on-farm composting of off-farm “organic matter” wastes and the co-composting of farm waste. Red meat slaughter wastes and poultry processing wastes are included in materials regulated under the *Organic Matter Recycling Regulation*.

The *Mushroom Composting Pollution Prevention Regulation* applies to a farm that is producing mushroom media that will be sold off-farm. It regulates air and water discharges by requiring an implemented pollution prevention plan. The specifications for the plan are identified in the *Regulation*.

This Act prohibits activities that may cause a health hazard:

- ◆ Section 15: a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard



Public Health Act

The Act also has conditions under the Public Health Act Transitional Regulation:

- ◆ Section 18: separation distance from wells to be at least 30.5 m from any probable source of contamination (probable source of contamination could include compost materials and leachate)



Fisheries Act

This Act has two sections of importance to compost management:

- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include compost materials and leachate)
- ◆ Section 37: requires approval for any work that may impact fish
- ◆ Section 38(4): requires reporting infractions of Section 36

COMPOST BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable composting related legislation, including the above, and where appropriate, use the following beneficial management practices to protect the environment.

→ see Chapter 6, Soil Amendments, regarding compost application to land

Compost Handling and Storage

Production Site. The primary consideration when siting a compost production area is the prevention of water pollution. Some situations may require distances greater than those specified in legislation.

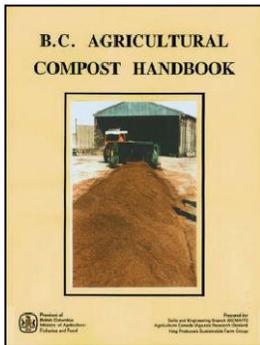
→ see Farm Building Siting, page 2-4

Potential odour nuisance complaints or other conflicts with neighbours, such as noise impacts, may be reduced by using the following practices:

- ◆ locate buildings according to the Agriculture Building Setback Standards (suggested) → see Farm Building Siting, page 2-4
- ◆ locate buildings and operations as far as possible from rural residences or residential areas
- ◆ take advantage of unique topography or microclimate conditions that could affect odour impacts
- ◆ site buildings and operations so that prevailing winds transport odours away from rural residences or residential areas
- ◆ use visual screening such as trees or natural mounds

Materials Storage. To avoid runoff and odour problems, store raw materials and finished compost under cover. Storage areas can be a simple, open structure with a roof. A concrete push wall could be added at one end to aid in the handling of materials with a front-end loader. Organic materials, if not handled carefully, may begin to decompose while in storage.

If the product is stored directly on the ground rather than on a raised concrete pad, divert runoff from the area. → see Runoff, page 9-42



Compost Facility. Composting is a method of recycling organic matter into stable organic material that can serve as a nutrient source or soil conditioner. The composting process should promote aerobic decay of organic materials while preventing the escape of potentially harmful gases and liquids. An effectively managed setup will produce temperatures high enough to destroy disease organisms contained in the plant material.

Carefully design buildings used for composting to provide adequate ventilation and interior visibility. Choose building techniques and products to withstand the high levels of ammonia and humidity that develop in most composting operations. Improper design will lead to moisture condensation, frost build-up and accelerated deterioration of the structure.

Good housekeeping practices, including frequent cleanup of spilled materials, will reduce the potential for odour problems.

 **BC Agricultural Composting Handbook (series of Factsheets)**

Compost Leachate Control

During decomposition of organic materials, nitrate-nitrogen, ammonia and organic compounds are produced. If water passes through compost materials, runoff carrying these compounds will be generated, causing risks to surface water and ground water. Covering stored compost raw materials and finished compost, and diversion of uncontaminated runoff to prevent infiltration, are all effective means of reducing leachate production. → see Leachate, page 9-48

In areas receiving high precipitation, composting on bare ground without cover is not recommended. Significant leaching from compost piles will occur, transporting organic and nutrient contaminants into the soil. These contaminants will slowly move down through the soil and may contribute to ground water pollution. Therefore, composting in high precipitation areas should be conducted under cover, on impervious surfaces with leachate collection.

In low rainfall areas, compost may be produced outside on uncovered concrete slabs, as shown in Figure 2.3, below. Collect, store, and recycle or apply all runoff to land. → see Runoff, page 9-42

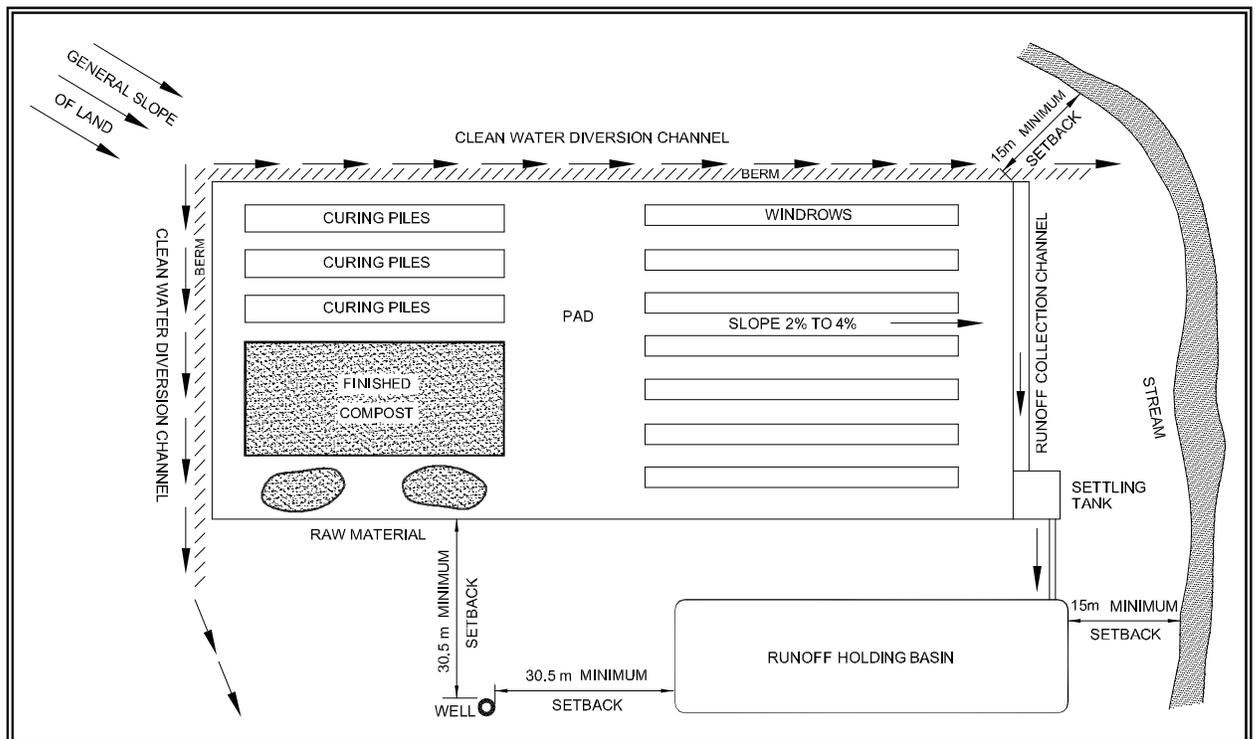


Figure 2.3 A Well-Planned Outdoor Composting Facility

Composting Odour Control

The composting process inevitably results in the release of large amounts of moisture and ammonia. If ammonia and other gases are released at unacceptably high levels, it may be necessary to enclose the composting facility completely and incorporate air emissions treatment systems. Chemical scrubbers and biofilters remove offensive odours from exhaust air. Chemical scrubbers may be necessary if biofilters are overloaded with ammonia gases.

→ see Indoor Poultry and Livestock Housing, page 3-5, and refer to Biofilters

Ensuring compost piles are aerated, by regular turning or by piping air through piles (static aeration) will reduce production of unacceptable odours.

To reduce odour impacts on neighbours establish and maintain an adequate buffer between compost operations and neighbours to keep odour from causing a nuisance or pollution. → see Buffers, page 11-4

Composting Noise Control

Grinding of raw ingredients, mixing of products and turning of compost piles can all generate significant amounts of noise. To reduce noise impacts on neighbours consider the timing of the operations. Also establish and maintain an adequate buffer between compost operations and neighbours to keep noise from causing a nuisance. → see Buffers, page 11-4

Mushroom Media

Implement the general composting practices outlined above and use specific mushroom media practices. → see Mushroom, page 4-17

Composting Livestock Mortalities

Implement the general composting practices outlined above and use specific livestock mortality practices. → see Livestock Mortality Disposal, page 3-37

ENERGY USE



ENERGY USE ENVIRONMENTAL CONCERNS

Primary environmental concerns related to energy use are:

- ◆ excess and inefficient use of energy that results in air pollution, or results in the unnecessary generation of greenhouse gases

For information on these concerns:

- ➔ see Air Quality Factors, page 10-1, refer to Dust and Particulates and to Volatile Organic Compounds
- ➔ see Climate Change Factors, page 12-1, and refer to Agricultural Greenhouse Gases

ENERGY USE LEGISLATION



Carbon Tax Act The *Carbon Tax Act* establishes a carbon tax in BC. Carbon tax is a broad based tax that applies to the purchase or use of fuels, such as gasoline, diesel, natural gas, heating oil, propane, coal, and the use of combustibles, such as peat and tires, when used to produce heat or energy. Carbon tax applies to fuels at different rates depending on their anticipated carbon emissions, and the tax rates are scheduled to change on July 1, 2011 and 2012. Farmers are required to pay carbon tax on fuel purchased or used for farming operations.

ENERGY USE BENEFICIAL MANAGEMENT PRACTICES

Energy Use Where appropriate, implement the following beneficial management practices to protect the environment.

Purchase energy efficient equipment and use technologies that reduce energy consumption and gas emissions that contribute to climate change. Energy auditing services are valuable in identifying areas where such advantages can be realized.

Energy Use in Buildings and Yards. For energy efficiency in and around buildings, implement the following practices:

- ◆ design and construct buildings to take advantage of natural light and the solar energy of the site
- ◆ use high efficiency furnaces for space and water heating
- ◆ use energy efficient lighting such as fluorescent, sodium, and metal halides
- ◆ use electrically efficient motors

- ◆ use control systems such as temperature, humidity and light sensors, timers, and dimmers that fine-tune energy input at required times and amounts
- ◆ use levels of insulation, vapour barriers and weather stripping in heated and cooled buildings that take local climatic conditions into account
- ◆ design livestock ventilation systems using appropriate minimum winter and maximum summer ventilation rates
- ◆ use heat exchangers on ventilated buildings (especially in colder climates)
- ◆ use directed lighting in areas that require focussed tasks to be accomplished
- ◆ use renewable sources of energy such as wind, solar, geothermal, biomass where economical → see On-Farm Energy Production, page 12-11
- ◆ establish shelterbelts and windbreaks around farm buildings to conserve heat and improve energy efficiency → see Buffers, page 11-4
- ◆ in greenhouses, use curtains to minimize night time heat losses
- ◆ in greenhouses, capture excess daytime heat resulting from carbon dioxide generation for use during night time heating
- ◆ where used, have heating and ventilation systems fully interlocked

Energy Use in Field Operations. For field operations implement the following practices:

- ◆ use fuel efficient tractors, trucks, and stationary equipment
- ◆ use appropriate fuels for different seasons
- ◆ avoid extended engine idling
- ◆ match tractor power to expected loads by “gearing up – throttling down”
- ◆ maintain all powered equipment as recommended by the manufacture
- ◆ minimize the number of passes over a field by carrying out multiple operations at the same time
- ◆ use no till or reduced tillage practices
- ◆ use radial tires on all powered mobile equipment
- ◆ keep tires at recommended inflation pressures
- ◆ ballast tractors for optimum match of wheel slip, horsepower, and speed
- ◆ use efficient irrigation and watering systems to reduce pumping energy
- 📖 **Pumping Livestock Water - It's all about energy choices!**
- 📖 **Energy Free Water Fountains**

Energy Use in Crop Drying and Feed Processing. For crop drying and feed processing facilities implement the following practices:

- ◆ use fuel efficient dryers and electrically efficient motors
- ◆ use automatic controls on low temperature aeration drying or monitor drying conditions frequently
- ◆ use continuous drying systems where possible
- ◆ monitor moisture content of materials while drying so that excessive drying is avoided



HEAT PRODUCTION AND AGRICULTURAL BOILER ENVIRONMENTAL CONCERNS

Primary environmental concerns related to heat production with boilers are:

- ◆ release of particulate matter from biomass fired boilers, and
- ◆ release of particulates and other harmful air contaminants (sulphur oxides and nitrogen oxides) from the burning of fossil fuels in boilers which can result in
 - health risks from inhaling the particulate
 - visual impairments from the emissions and due to the formation of smog
 - environmental impacts
- ◆ emission of carbon dioxide (CO₂) from fossil fuel fired boilers which contributes to climate change
 - the combustion of biomass is considered to be carbon neutral

For information on these concerns:

- ➔ see Air Quality Factors, page 10-1
- ➔ see Climate Change Factors, page 12-1

HEAT PRODUCTION AND AGRICULTURAL BOILER LEGISLATION

The following is a brief outline of the main legislation that applies to heat production and agricultural boilers.

- ➔ see page A-1 for a summary of these and other Acts and Regulations

Local Bylaws Regional and municipal governments can pass bylaws to control emissions from boilers.



Environmental Management Act

Under the *Environmental Management Act*, local governments may be delegated authority to manage air quality within their boundaries (e.g. Metro Vancouver). Local and regional governments can pass bylaws that regulate emissions from industrial, commercial and industrial sources, through permits, compliance promotion and enforcement.

The *Code* under the *Agricultural Waste Control Regulation* regulates emissions from biomass fuelled boilers used in agricultural production:

- ◆ Section 18: regulates types of acceptable fuel and emissions from biomass fired boilers used in agricultural production

- ◆ Sections 18.1 – 18.6 set emission standards, testing and reporting requirements for boilers and heaters fuelled by biomass

The *Agricultural Waste Control Regulation* and the Metro Vancouver *Agricultural Boilers Emission Regulation Bylaw No. 1098* are harmonized with respect to boiler emission limits, registration, monitoring and reporting and allowable fuel types. If you are located in Metro Vancouver, please refer to the Metro Vancouver bylaw 1098.

http://www.metrovancouver.org/boards/bylaws/Bylaws/GVRD_Bylaw_1098.pdf

HEAT PRODUCTION AND AGRICULTURAL BOILER BENEFICIAL MANAGEMENT PRACTICES

Emissions Standards Traditional fuel sources for boilers include natural gas, heating oil, propane and in a few cases, coal. Due to rising fuel costs, these fuel sources are being replaced by biomass and subsequently new regulations that set standards for air emissions from agricultural boilers have been implemented. In 2008, the amendments to the *Code* under the *Agricultural Waste Control Regulation* and Metro Vancouver’s bylaw No.1098 were introduced to establish consistent rules for all boilers used in agriculture. The *Code* as well as the *Agricultural Boilers Emission Regulation Bylaw* defines biomass used for boiler fuel as:

- ◆ agricultural fuel products, including agricultural pellets, manure pellets, corn kernels, corn stalks, seed hulls or wood or wood products
- ◆ but does not include any raw manure; paper or paper product; wood or wood product that has been treated with glue, paint or preservative, that contains a toxic substance or is salt laden

The *Code* under the *Agricultural Waste Control Regulation* sets the emission standards for biomass boilers used in agriculture. These limits are seen in Table 2.3 below. Metro Vancouver’s emission standards in the bylaw are harmonized with these standards.

Table 2.3 Emissions regulation limits for Boilers and Heaters Fuelled by Biomass

Capacity of Boiler or Heater	Emission Standards (effective September 1, 2010)	
	Particulate Matter Limit	Opacity Limit
Greater than 3 MW	35 mg/m ³	10%
Greater than 1 MW but not greater than 3 MW	50 mg/m ³	10%
Less than 1 MW	120 mg/m ³	20%

Any person who is operating a boiler or heater for agricultural purposes is required to register with the Ministry of Environment or, if located in the Greater Vancouver Regional District (Metro Vancouver), with Metro Vancouver before the boiler or heater is used. This can be done by following the online registration guide found at:

- ◆ if located in BC, outside of Metro Vancouver

http://www.env.gov.bc.ca/epd/industrial/regs/ag_waste_control/index.htm#3

- ◆ if located in Metro Vancouver

<http://www.metrovancouver.org/services/permits/Pages/airquality.aspx>

Table 2.4 below will help to determine the boiler output.

Table 2.4 Boiler Capacity Conversion to Megawatts
Boiler capacity information may be found on the boiler nameplate (metal tag attached to the boiler), or from the boiler manufacturer.
Reporting Capacity in megawatts (MW)*:
_____ GJ/hr x 0.2778 = _____ MW
_____ MMBTU/hr x 0.2931 = _____ MW
_____ Boiler BHP x 0.009803 = _____ MW
<p>Example: The boiler plate indicates energy input of 400 BHP: Therefore 400 BHP x 0.009803 = 3.9212 MW. *GJ – Gigajoules, MMBTU – Millions of British Thermal Units, BHP – Boiler Horse Power</p>

Emissions Reduction Comply with applicable emissions related legislation, including the above, and where appropriate, implement the following beneficial management practices to protect the environment.

- ◆ use energy management systems that ensure optimization of temperature and humidity
- ◆ implement emission control devices on biomass burners
- ◆ ensure biomass fuels have optimum moisture content
- ◆ use boilers with low particulate generation
- ◆ implement a maintenance program for solid fuel boilers and all heating system components
- ◆ use appropriately sized and efficiently operated heating plants for greenhouse and other production facilities
- ◆ use cleaner burning material in burners to ensure a clean burn and maximize energy generation
- ◆ separate out and do not burn contaminated biomass, such as treated wood
- ◆ establish and maintain adequate windbreak and shelterbelt buffers around farm buildings and livestock facilities to improve energy efficiency
 → see Buffers, page 11-4
- ◆ maximize the use of on-farm renewable energy, such as wind or solar to reduce imported energy needs
 → see On-Farm Energy Production, page 12-11



On-farm **product preparation** refers to the cleaning, sorting, separating, grading, or packing of farm products.

On-farm **processing** refers to processes that include mixing; drying; canning; size reduction; fermentation; and heat, cold, chemical or biological treatment to prepare farm products or value-added products for sale.

→ see Crop Processing, page 4-10, for processing livestock feed

ON-FARM PROCESSING AND SALES ENVIRONMENTAL CONCERNS

Primary environmental concerns related to on-farm processing are:

- ◆ disposal of processing wastes, waste product and wash water that results in soil, water or air pollution
- ◆ washing or processing crops with poor water quality (e.g., pathogens) that results in food unfit for consumption

For information on these concerns:

- see Soil Quality Factors, page 8-2, refer to Contaminants, and to Salts
- see Water Quality and Quantity Factors, page 9-2, refer to Contaminants, and to Oxygen Demand
- see Air Quality Factors, page 10-1, refer to Dust and Particulates, to Odours, and to Open Burning

ON-FARM PROCESSING AND SALES LEGISLATION

The following is a brief outline of the main legislation that applies to on-farm processing and sales.

→ see page A-1 for a summary of these and other Acts and Regulations

Local Bylaws Local governments may regulate aspects of on-farm processing and sales that relate to size, setbacks, parking, signage, and hours of operation.



Agricultural Land Commission Act

The *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* outlines permitted processing and sales activities in Section 2 and 3.



Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving *more* than one single-family residence).

- ◆ Section 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system



Environmental Management Act

On-farm processing wastes are not regulated by the *Agricultural Waste Control Regulation*, and may require authorization for introduction of a waste to the environment. The discharge of processing waste may require a permit from MOE.

The *Ozone Depleting Substances and Other Halocarbons Regulation* regulates the servicing of refrigeration equipment and disposal of refrigerant gases.

The *Code of Practice for the Slaughter and Poultry Processing Industries* regulates the disposal of solid and liquid wastes produced by the slaughter industry under the *Waste Discharge Regulation*.

This Act prohibits activities that may cause a health hazard:

- ◆ Section 15: a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard



Public Health Act

The Act also has conditions under the Public Health Act Transitional Regulation:

- ◆ Section 18: separation distance from wells to be at least 30.5 m from any probable source of contamination (probable source of contamination could include processing wastes)

Under the *Food Premises Regulation*, food premises must be connected to a source of potable water and be connected to a waste disposal system, among other requirements.



Canada Agricultural Products Act

This Act has conditions under the *Fresh Fruit and Vegetable Regulation* requiring that no stagnant or polluted water is used in the washing or fluming of the produce, and only potable water is used in the final rinsing of the produce to remove any surface contaminant before packing.



Fisheries Act

This Act has three sections of importance to processing facilities:

- ◆ Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include processing wastes)
- ◆ Section 37: requires approval for any work that may impact fish
- ◆ Section 38(4): requires reporting infractions of Section 36

ON-FARM PROCESSING AND SALES BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable on-farm processing and sales related legislation, including the above, and where appropriate, implement the following beneficial management practices to protect the environment.

On-farm product preparation, processing and sales can generate wastes and cause impacts which, for regulatory purposes, may not be regarded as agricultural. In such cases, investigate the requirements of the *Environmental Management Act* to ensure that environmental concerns are addressed.

Wastes derived from processing of primary agricultural production (e.g. carrot tops, stems of flowers) should be handled in the same manner as farm wastes. If the wastes can be adequately dealt with by the farming operation, a permit or approval may not be required. It is advisable to contact MOE if there are any questions regarding the handling and disposal of a particular waste material.

Separate approvals are required from both the Ministry of Health Services for domestic waste disposal and from the Canadian Food Inspection Agency to ensure food safety and quality for on-farm processing operations.

Product Processing & On-Farm Direct Sales Facilities

For all agricultural operations that process product for direct sale, implement the following practices:

- ◆ locate facilities away from yard drain inlets, ditches, wells and watercourses
 - at least 30.5 m from wells (*Public Health Act*)
 - to meet the Agriculture Building Setback Standards (suggested)
→ see Farm Building Siting, page 2-4
 - at least 30 m from a water intake used for domestic purposes (suggested)
- ◆ design and manage a facility so that contaminated runoff from parking lots, roofs, and other hard surfaces does not enter watercourses or wells
- ◆ have a professional design storage lagoons and tile fields for domestic sewage and register the sewage discharge with Ministry of Environment or Ministry of Health Services (*Environmental Management Act*)
- ◆ recycle containers (e.g., berry flats), wash water, etc. whenever possible

Processing Water Quality. Agricultural operations that process product for direct sale use large volumes of water during processing operations. Implement the following practices to maintain water quality.

- ◆ ensure water quality for processing, such as washing, meets potable (drinking) water requirements (*Canada Agricultural Products Act*)
- ◆ never discharge wash water directly into a watercourse
- ◆ never discharge wash water into a domestic sewer system without approval
- ◆ dispose of wash water in an environmentally acceptable manner
 **Treating Irrigation and Crop Wash Water for Pathogens**

Drinking Water Quality. Direct farm markets may provide drinking water to customers. Ensure water quality standards are met by implementing the following monitoring practices:

- ◆ if providing drinking water to the public, ensure water meets drinking water standards (*Drinking Water Protection Regulation*)
 - no detectable fecal coliform bacteria per 100 ml
 - no detectable *Escherichia coli* per 100 ml
 - no detectable total coliform bacteria per 100 ml if a single sample is taken in a 30 day period
 - at least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml if more than one sample is taken in a 30 day period
- ◆ ensure limits on chemical and physical parameters (such as nitrates and heavy metals) are met

 **Guidelines for Canadian Drinking Water Quality**

Abattoirs On-farm butchering, and the wrapping, freezing and processing of meat generates environmental concerns. The Ministry of Environment has established the *Code of Practice for the Slaughter and Poultry Processing Industries* that addresses discharges to the environment from the slaughter and poultry processing industries. A number of other specific regulations and requirements that apply to abattoirs are administered primarily by the Canadian Food Inspection Agency, BC Center for Disease Control and the BC Ministry of Health Services.

Composting Processing Wastes. Some wastes from on-farm processing can be composted. Ensure that composting meets the requirements of the *Organic Matter Recycling Regulation*. → see Compost Legislation, page 2-32