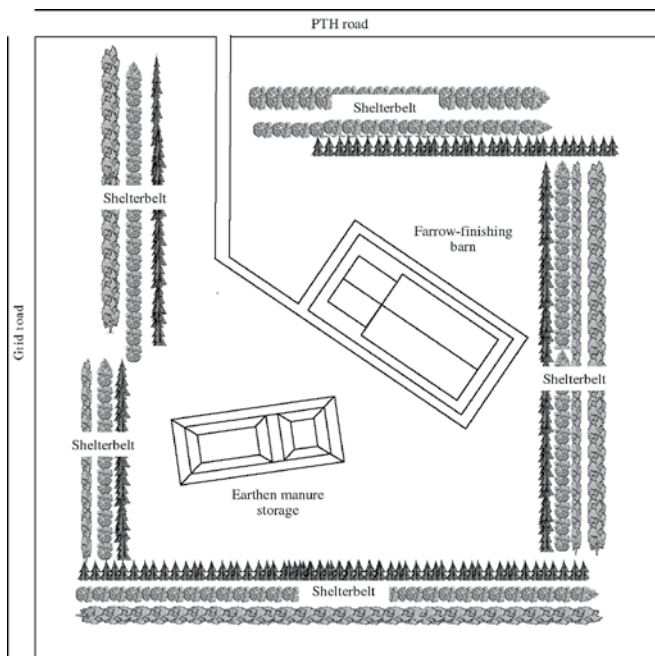


SECTION 6

Site SELECTION

When planning a pig operation, the selection of the site is critical in the planning stage. There are many factors that must be considered when choosing a site. The location of the facilities in relation to property lines, neighbours and rural residential developments can have a significant affect on potential nuisance issues and future expansion plans. As explained in Section 5, greater separation distances tend to reduce nuisance complaints.



Planning the yard design to include tree rows is a good idea

6.1 Setback of Facilities from Physical Features

A minimum setback of 50 m from housing structures (excluding hoop shelters) to property lines is required (Table 12). The Livestock Manure and Mortalities Management Regulation requires that all new manure storage structures and confined livestock areas, such as hoop shelters and feedlots be located at least 100 m from property boundaries (Table 12), watercourses, sinkholes and wells.

Power and gas lines should be located to avoid damage when digging, excavating or driving stakes into the ground. Verify that there are no Rights of Way on your site that authorize the use of a piece of public land for specific purposes for a specified period of time.

The location of buildings, structures, fences, plantings and the establishment of various enterprises adjacent to provincial roads and highways are regulated by Manitoba Transportation and Government Services. Access to provincial highways and the discharge of surface runoff into highway ditches is also controlled by Manitoba Transportation and Government Services.

In general, the construction of buildings, structures and fences or the planting of trees within 38 to 76 m (125 to 250 ft) of certain provincial highways or within 152 m (500 ft) of major highway intersections requires a permit from Manitoba Transportation and Government Services. These distances can vary from one

highway to another and at different intersections, so it is important to contact Manitoba Transportation and Government Services early in the planning stages.

6.1.1 Separation between livestock operations

Careful consideration must be given to the presence of other livestock operations when selecting a site for a new operation. Adequate separation from other livestock operations raising the same species is recommended to prevent the spread of livestock diseases.

Animal diseases can be transported by natural vectors, such as rodents and birds. This complicates the establishment of specific separation distances between livestock operations. However, the further a new operation is from other operations of the same type, the lower the risk will be of transmitting a disease. Other preventative measures, such as setting up a bio-security program and ensuring proper pest control, are as important as providing adequate separation distances.

6.2 Setbacks and Other Steps to Avoid Conflicts

Agricultural operations are a source of traffic, noise, dust and odours. One of the key elements to successful siting of a livestock operation is to observe appropriate separation distances between potentially conflicting land uses. This is particularly important for the effective dispersion and dilution of odours from pig production facilities.

When deciding where to build a new livestock operation, it is best to choose a site with as few neighbours as possible. Table 13 provides recommendations for the maximum number of residences, not including that of the operator, within a 1.6 km radius of various sizes of operations. The maximum number of residences within a 1.6 km radius of an operation applies to new operations only. If the number of residences exceeds the number in Table 13, an alternate site should be considered.

Table 13 also provides minimum separation distances from new and expanding livestock operations to single residences and designated residential areas. Greater separation distances are required as the size of the operation increases. Greater separation distances are also recommended for earthen manure storages as

Table 12: Setbacks^{1,2} From Property Lines, Watercourses, Sinkholes And Wells

Recommended	To animal housing structure (excluding hoop shelters)	50 m
Required	To confined areas including hoop shelters and feedlots	100 m
	To manure storage structures ³	100 m

¹ Agencies such as Manitoba Hydro or the local government may have requirements in addition to these.

² See Appendix C for imperial units.

³ Requirement of the Livestock Manure and Mortalities Management Regulation – see Appendix B.

compared to other storage types and livestock housing. The Provincial Land Use Policies Regulation has incorporated the separation distances in Table 13 as minimum standards that are to be adopted in the zoning by-law, but municipalities may require greater separation distances. Table 14 illustrates the relationship between various types and sizes of pig operations and their animal unit (A.U.) equivalents. When a municipal council considers an application for a livestock operation development permit, the council will determine whether the proposal meets the zoning by-law's siting criteria. Contact your local Rural Municipality for the most recent setbacks.

6.2.1 Using the landscape

Other factors to consider when selecting a site are trees, windbreaks, prevailing wind direction and air movement. Air drainage can cause odour to drift downslope.

Multiple benefits can be derived from the proper use of naturally treed areas. Treed buffers and shelterbelts can effectively reduce and disperse odours from a site (see Section 5.4.3). The image conveyed by a well landscaped and maintained livestock operation can reduce odour complaints from neighbours. As much as possible, livestock facilities should be blended into the landscape and natural vegetative buffers should be preserved.

Benefits from the existing topography should be incorporated when planning the facilities. Some slopes can be an asset for the manure handling system. For example, by using the

Table 13: Recommended Criteria For Siting Livestock Operations

Animal Units ¹ (A.U.)	Maximum Number of Residences ² Within 1.6 km	Minimum Distance ³ (m)			
		From Single Residence		From Designated ⁴ Residential or Recreational Area	
		To Earthen Storage	To Buildings ⁵	To Earthen Storage	To Buildings
10 - 100	18	200	100	800	530
101 - 200	16	300	150	1200	800
201-300	15	400	200	1600	1070
301 - 400	14	450	225	1800	1200
401 - 800	12	500	250	2000	1330
801 -1600	10	600	300	2400	1600
1601 - 3200	8	700	350	2800	1870
3201 - 6400	6	800	400	3200	2130
6401 - 12800	4	900	450	3600	2400
12801 and greater	2	1000	500	4000	2670

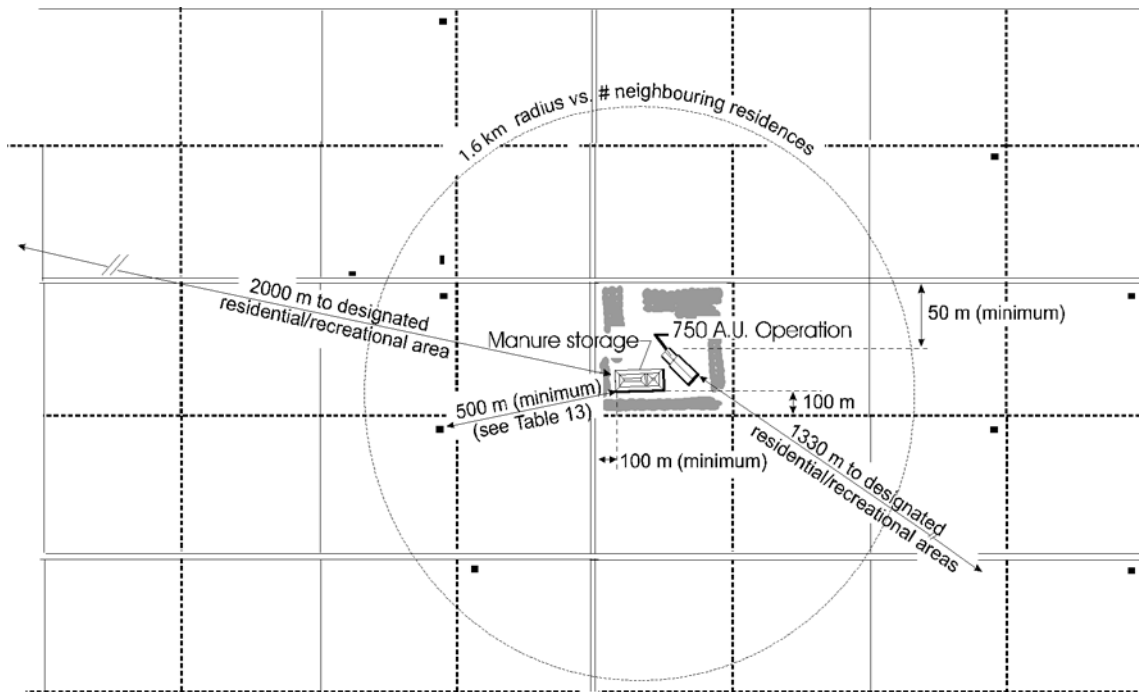
¹ Refer to Table 14 for number of animals.

² Number of residences within 1.6 km (one mile) of the center of the facility applies only to new facilities. Expansions of existing facilities and the proponent's residence are excluded.

³ These separation distances apply to new and expanding operations; see Appendix C for imperial units.

⁴ Officially designated areas in a development plan or basic planning statement.

⁵ The distance to buildings includes barns and non-earthen manure storages such as above or below grade structures which may be covered or uncovered.



The planning process must take in account setbacks from a number of physical features (setbacks shown refer to Table 13)

Table 14: Converting Number Of Animals To Animal Units

Animal Units ¹ (A.U.)	Barn Capacity or Animal Places				
	Sows, Farrow-Finish (110 – 115 kg) ²	Sows, Farrow-Weanling (5 kg) ²	Sows, Farrow-Nursery (23 kg) ²	Weanlings (5 – 23 kg) ²	Grower/Finishers (23 – 113 kg) ²
10 - 100	8 - 80	32 – 319	40 – 400	303 – 3030	70 – 699
101 – 200	81 – 160	323 – 639	404 – 800	3061 – 6061	706 – 1399
201 – 300	161 – 240	642 – 958	804 – 1200	6091 – 9091	1406 – 2098
301 – 400	241 – 320	962 – 1278	1204 – 1600	9121 – 12121	2105 – 2797
401 – 800	321 – 640	1281 – 2556	1604 – 3200	12152 – 24242	2804 – 5594
801 - 1600	641 – 1280	2559 – 5112	3204 – 6400	24273 – 48485	5601 – 11189
1601 – 3200	1281 – 2560	5115 – 10224	6404 – 12800	48515 – 96970	11196 – 22378
3201 – 6400	2561 – 5120	10227 – 20447	12804 – 25600	97000 – 193939	22385 – 44755
6401 – 12800	5121 – 10240	20450 – 40895	25604 – 51200	193970 – 387879	44762 – 89510
12801 and greater	10241 and greater	40898 and greater	51204 and greater	387909 and greater	89517 and greater

¹ Refer to Appendix I for definition of Animal Unit.

² Based on live weight.

slope, manure can be moved to the storage by gravity rather than pumps. Also, if attention is paid to existing yard elevations, potential savings in earth moving for driveways and building pads may be possible.

Wind can carry odour to neighbours. Prevailing winds, however, can vary between seasons. Since summer is the time when odours are more intense and neighbours are outdoors more often, the direction of the prevailing winds during the summer should be considered. Siting the operation so that summer prevailing winds are away from neighbours can minimize the number of times neighbours are exposed to odours.

During calm, summer evenings, the air near the ground will be cooled and drift down a slope; this is known as air drainage. In much of Manitoba, the land is fairly flat, so air drainage is not a major concern. However, if an operation is planned where a neighbour's residence is in a down slope direction, then the odour nuisance potential increases. As the air passes the pig operation, it will pick up odours which can create a problem. This phenomenon may occur frequently during calm summer evenings, just at the time when most people like to be outdoors.

6.3 Avoiding Contamination of Wells

Livestock facilities should be located to maximize the setback to water supply wells. This is particularly important with field storage or earthen manure storage structures where groundwater is obtained from shallow wells or where bedrock is found close to ground surface.

Manure storage structures must be constructed at least 100 m from wells. Setbacks from other sources of water as required by the Livestock

Manure and Mortalities Management Regulation (Appendix B) are provided in Table 2 (Section 3).

Wells should be located and constructed to protect water quality over the long-term. They should be located up slope from manure storage structures and in areas isolated from vehicle traffic, livestock transport and handling areas and site activities. All wells should be constructed and maintained in a manner which will prevent water and/or contaminants from entering the well. All construction work should be completed by qualified and experienced people familiar with water well construction and proper well head protection. The following construction and maintenance practices should be used:

- grouting the annular space outside the casing with cement or bentonite where appropriate
- providing drainage away from the well
- extending the well casing adequately above grade (at least 0.30 to 0.45 m)
- using a watertight, vermin-resistant and properly sized well cap
- ensuring the well vent opening on the well cap is properly screened and clear of debris
- using a proper pitless unit or adapter to provide a sanitary hook-up of water lines
- in unprotected flood-prone areas, using a check valve type of air vent and conduit cable seal
- sealing old wells that are no longer in use as per Manitoba Water Stewardship guidelines

6.4 Environmental Considerations for Siting

The geological and hydrogeological features specific to a site may warrant particular construction requirements for the facilities. When choosing a site for a livestock operation, it is important to investigate these aspects.

6.4.1 Siting of manure storage structures

When planning an earthen manure storage, the suitability of potential sites must be evaluated using information on subsurface materials and the presence of aquifers. This information can be obtained from existing soils and geological or hydrogeological maps or by examining water well logs which are available from Manitoba Water Stewardship. In all cases, some exploratory drilling will be required to verify the geological and hydrogeological conditions beneath the planned storage. Earthen manure storage structures may not be suitable or they may have to be lined with a clay or synthetic liner at sites where an aquifer is shallow. Monitoring wells would likely also be required. In areas with complex geology or hydrogeology, specialized testing may also be required to evaluate site conditions. Please refer to Manitoba Conservation's website for more information.

6.4.2 Considerations for application of livestock manure

The suitability of all fields identified for manure applications should be assessed. Manure that is to be applied must be applied as a fertilizer for crop production. Manure application rates should be based on the nutrient requirements or removal capabilities of the crop. The crop's ability to use nutrients depends on its yield potential. This is determined by the agriculture capability of the soil, weather conditions and management practices.

The fields identified for manure application can be assessed using the Canada Land Inventory Soil Capability Classification for Agriculture. For new operations, the Livestock Manure and Mortalities Management Regulation prohibits manure application on soils with agriculture capability classifications of Class 6, 7 and unimproved organics. These soils are considered unsuitable for manure applications and are equivalent to Zone 4 soils under Manitoba Water Stewardship's proposed regulation defining Water Quality Management Zones for Nutrients. Information on the Canada Land Inventory Soil Capability Classification for Agriculture is available from Manitoba Agriculture, Food and Rural Initiatives.

Areas where the subsoil consists of coarse granular materials such as gravel or sand and gravel, as well as where bedrock aquifers are found close to ground surface, may be unsuitable for livestock manure application. In areas where limestone and dolomite bedrock is close to the surface, potential fields for application should be carefully examined to determine if sinkhole features are present.

6.5 Water Resource Availability

An approval and/or a licence may be required under *The Water Rights Act* to withdraw water from a surface or groundwater source (see Section 2). *The Water Rights Act* requires a licence for surface water or groundwater withdrawals that exceed 25,000 Litres per day (5,500 imp. gal/day).

Sources, availability and quality of water should be evaluated during the early planning stages. In some parts of the province the required volumes may be difficult to obtain. If surface water is being considered, ensure that the source, if it is a stream, flows at all times of the year and that the required amount of water is available for extraction. If considering a groundwater source, determine whether the aquifer is capable of producing the volume of water required. Information on groundwater availability can be obtained from Manitoba Water Stewardship. In some cases, test drilling may be required to determine if an aquifer is present and could provide the required amount of water. The quality of the groundwater should also be determined. In some parts of the province, groundwater is sufficiently saline, or contains high concentrations of some constituents, that may limit its quality or suitability for livestock watering purposes. All producers are encouraged to have their well water sampled and analyzed prior to introducing

livestock to their new or expanding operation. This will establish a benchmark or baseline which can be used to evaluate water quality changes over time as well as to address allegations of impacts from the operation. Although producers with 300 or more animal units are required by the Livestock Manure and Mortalities Management Regulation to submit results of their well testing annually, all producers are encouraged to monitor their well water quality regularly to ensure that their livestock are being provided with water suitable for drinking.

6.6 Professional Support

Since every situation is unique, each site should be evaluated with the assistance of a land use planner for the area, a geoscientist or an agricultural engineer registered with the Association of Professional Engineers and Geoscientists of Manitoba, a Professional Agrolgist and a Certified Crop Advisor.

