



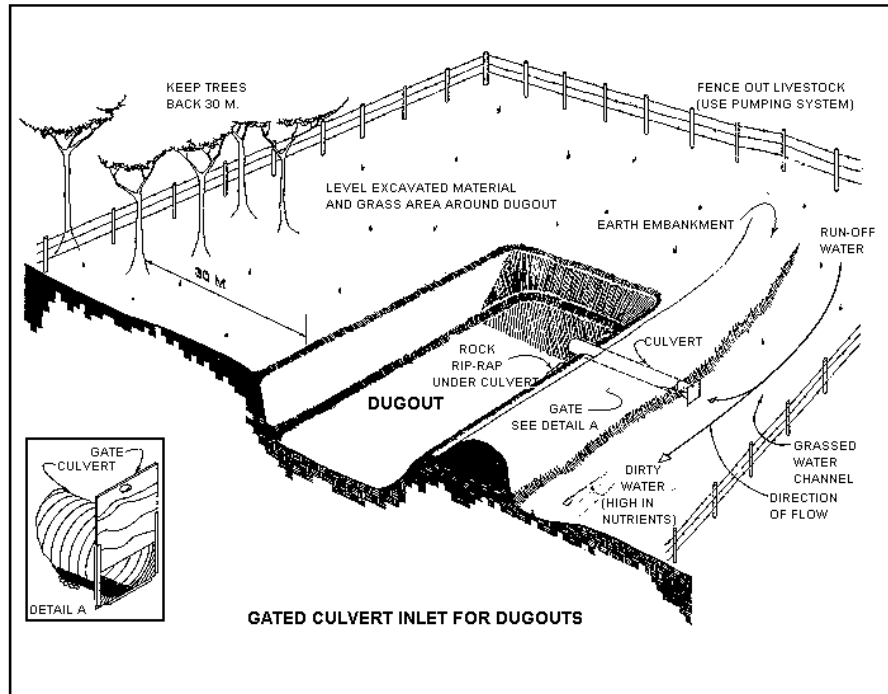
## CHOOSING A DUGOUT LOCATION

April 2000

Several factors are important in selecting a location for a farm dugout. These include adequate drainage to fill the dugout, prevention of possible pollution problems, control of runoff, soil type and accessibility of the dugout for maintenance.

### Drainage

The dugout should be located where there is sufficient runoff to adequately fill, even after winters of minimal snowfall. When located in relatively flat, treeless plains, the runoff from 100 hectares (250 acres) or more may be required to fill a farm dugout on a regular basis. The area may be significantly reduced by using snow fences or shelterbelts. Melted snow provides the best quality water for dugouts. If located near creeks or drainage ditches, the dugout should be located so the runoff water can be diverted in or around the dugout as required. **Do not locate the dugout in the middle of a creek or water runway.** If runoff water is allowed to flow directly through the dugout, it will fill with all the silt and other debris being carried with the runoff causing the water quality to deteriorate extremely quickly. If the dugout is to be located within or next to a slough, the dirt excavated should be used to provide a dike or berm separating the dugout from the slough. A gated culvert can be used to allow water into the dugout from the slough as required. If the dugout and slough are allowed to be permanently joined, any possible control of the water quality will be impossible to achieve.



### Size

To supply an average size farm with a dependable one-year water supply, a dugout should have a storage capacity of at

least three million litres (approximately 650,000 Imperial gal.). The dimensions would be 61 x 21 x 4 metres (200 x 70 x 14 ft) or larger. A larger dugout

may be required if the farm consists of a large livestock enterprise, or if for any reason there may be difficulty in filling it each year. If a two-year supply of water is required to compensate for years with little to no runoff, installing two separate dugouts rather than one large one would be recommended. The dugouts should be kept separate and not linked together with a trench. During dry periods, when the two dugouts are only half full in the fall, one dugout can easily be pumped into the other to provide a full dugout to meet the winter watering requirements. To evaluate the water requirements of your farm and provide technical assistance on sizing and location, contact either the Prairie Farm Rehabilitation Administration (PFRA) or The Manitoba Water Services Board office in your area.

### Controlling Water Quality

Water quality in dugouts is directly related to the nutrients in the water. The higher the nutrient loading, the more frequent and more severe the algae blooms become. Steps must be taken to control the nutrients entering the dugout if good water quality is to be realized.

The dugouts should be located so drainage from barnyards, feedlots, garbage areas, etc., will not pollute and increase the nutrient loading of the water. It is always recommended to construct dykes to control the flow of runoff water around the dugout. To insure the best quality of water is entering the dugout, the first flush of water in the runoff occurrence should not be allowed to enter the dugout as it contains high levels of nutrients. These nutrients will only lead to future algae blooms. Once the first flush of water has passed, the culvert is opened and the dugout is allowed to fill. When the dugout is full of water, the gate is closed and the remaining water is diverted around the dugout. The dugout should be at least 15 metres (50 ft.) away from trees, since leaves blowing into the water will decompose and cause not only adverse tastes and odours but will also increase the nutrients in the water. Wherever possible the runways carrying runoff should be grassed down to help reduce the sediment loading of the water. If water quality is a concern, the dugout should always be fenced to keep livestock out.

### Soil Types

If the sub-soil at the proposed site is highly variable, it is advisable to drill some test holes to help determine the most suitable location. Clay or clay mixture soils are the most suitable because of their ability to retain water. If the soil is porous, yet contains more than 20 percent clay, sodium compounds can be used to make the soil less permeable. Soil tests are usually required before any compounds are added to the soil. If groundwater seepage is encountered, another site should be chosen, as the water in the dugout will seep out of the dugout as easily as it seeps in.

Before making a final decision on the location and size of the dugout, contact the PFRA or The Manitoba Water Services Board farm water technologist in your area for assistance.

*For further information on dugouts, refer to these Water Facts:*

- Dugout Maintenance
- Dugout and Pond Aeration
- Floating Intakes for Dugouts and Ponds
- Treating Surface Water

Your Regional Farm Water Source Technologist at one of the following locations:

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Metric Conversions		
<u>Nominal Pipe Diameter</u>		<u>Flows</u>
Mm	in.	1 Imp. Gal. = 4.546 L
3	1/8	1 U.S. Gal. = 3.785 L
6	1/4	
10	3/8	<u>Dimensions</u>
11	1/2	1 in. = 25.4 mm
20	3/4	= 2.54 cm
25	1	1 ft. = .3048 m
32	1 1/4	3.28 ft. = 1 m
40	1 1/2	
50	2	<u>Pressure</u>
75	3	1 psi = 6.895 kPa
100	4	
150	6	<u>Power</u>
200	8	1 hp. = 0.7457 kW
		1 kW = 1.34 hp