



SUSPENDED INTAKES FOR DUGOUTS AND PONDS

January 2004

With the advent and expanded use of proper aeration systems in dugouts throughout the prairies, the need for a proper floating intake system is no longer required in many cases. Because the dugouts are continuously aerated, the quality of water does not vary greatly between the top and the bottom of the dugout even during the winter season. While it is desirable not to draw the water from the bottom of the dugout, proper aeration now allows the water to be drawn from the middle of the dugout without sacrificing quality. A properly constructed and located suspended intake is important in assuring that the best quality of water is drawn into the water system.

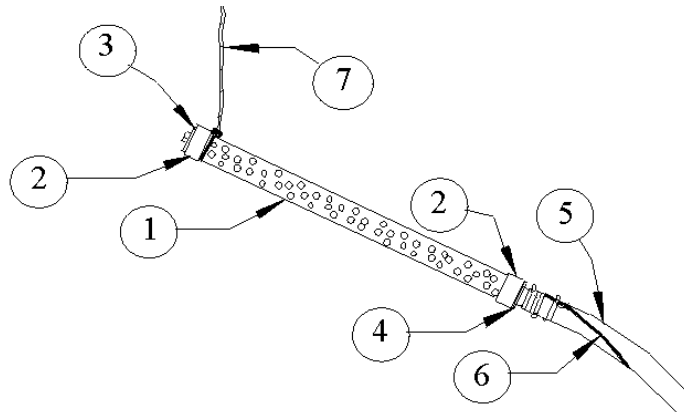
Suspended intakes have a number of advantages. They are easy to install, float under the water surface during summer and do not have to be pulled under water below ice level for winter operation. This results in efficient, year round operation. A suspended intake should only be installed in dugouts that have proper aeration installed and operated continuously. The suspended intake described below is sufficient for flows up to 60 l/m (16gpm) and does not require the use of a boat for installation.

Intake Assembly Construction

The suspended intake assembly shown may be purchased or constructed following the steps below.

Numbering matches the numbers of the parts in the diagram opposite.

1. Construct an intake chamber 75mm x 1m (3 in. x 3.3 ft.) of rigid plastic pipe (PVC) with a minimum of two hundred 3mm (1/8 in.) perforations drilled along its length.
2. Attach 75mm (3 in.) PVC female thread adapters (S x FPT) to each end using the proper solvent weld glue.
3. Screw in a 75mm (3 in.) threaded PVC plug into the adapter on one end of the chamber to act as a clean out fitting at a later date.
4. Install a 75mm x 50mm (3 in. x 2 in) PVC threaded reducer bushing into the adapter.
5. Connect a 50mm (2 in.) intake line using a polyethylene pipe c/w nylon adapter and all SS clamps to the intake chamber.
6. Place a continuous weight made of 12mm (1/2 in.) polyethylene pipe filled with dry sand on the intake pipe. Once the sand is inserted and saturate with water, plug ends of pipe. Secure the continuous weight using nylon cable ties or stainless steel clamps. This will stop the pipe from floating up to the surface and freezing into the ice.
7. Attach a nylon rope 10mm (3/8 in) in diameter and 1.2m (4 ft) to the end of the intake chamber and to an appropriate float. A smaller stainless steel cable can be utilized if muskrats are present and not controlled.



The float can be made up using a 1m (3.3 ft) length of 75mm (3 in.) PVC pipe with caps solvent welded on each end or several sheets of Styrofoam SM board .5m x .5m (1.5 ft. x 1.5 ft.) sandwiched between sheets of plywood.

A separate rope should be installed from the intake section and secured to the shore to keep the intake properly placed over the aeration line in the dugout.

For proper operation and to prevent the float assembly from freezing into the ice, the suspended intake must be installed only in dugouts that are continuously aerated.

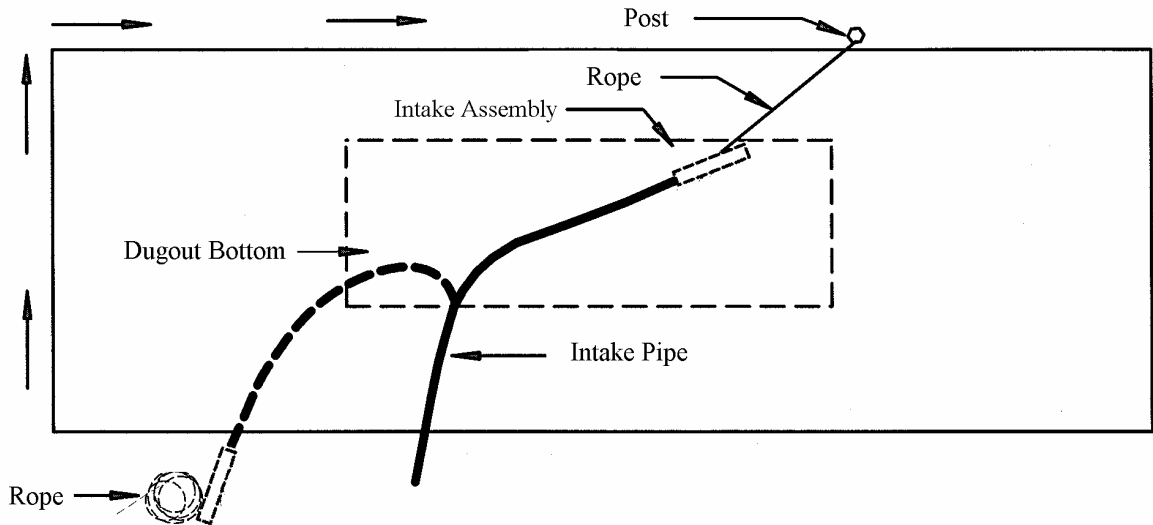


Fig 2: Float Assembly Placement and Installation

Intake System Installation

1. Begin trenching at approximately 30° to the dugout (see Figure 2) reaching as far as possible into the dugout.
The trench must be at an angle to the dugout to facilitate installation and removal of the intake system.
2. Determine the length of intake line to place the intake assembly approximately 2/3 of the distance across the dugout and 30° to the dugout shore. A 21m (70 ft) wide dugout requires approximately 15 m (50 ft) of intake line from the dugout edge. This insures there is sufficient pipe to bring the intake around to shore line for normal maintenance.
3. Thread the intake line through 6 m (20 ft) of larger diameter pipe (e.g. weeping tile) to serve as a protective casing where the intake line enters the dugout. A common protective casing may be used for both the intake line and aeration line. (See Water Facts "Dugout and Pond Aeration").
4. Connect the pre-assembled intake assembly to the intake line.
5. Wrap and tie the continuous weight (#7) to the intake line.
6. Attach the nylon positioning rope to the intake and with rope in hand, walk the perimeter of the dugout to the opposite shore. Pull firmly on the rope dragging the intake assembly and weighted intake pipe in line with the trench. Slacken the rope allowing the intake pipe to sink into the trench and tie the rope to a post located on shore.
7. Backfill cautiously to prevent crimping while holding the aeration intake line and protective casings in position at the bottom of the trench. If there is water in the trench, the buoyant force of the lines may be reduced by filling the lines with water.

The intake assembly must be positioned over the aeration points to insure the float assembly is free of the ice in the spring. Where muskrats are known to be a menace, plastic-coated clothesline cable can be used rather than nylon rope.

To remove the intake assembly, simply walk around the dugout with rope in hand and pull on the rope dragging the assembly and float to the shore. Be sure not to kink the intake line.

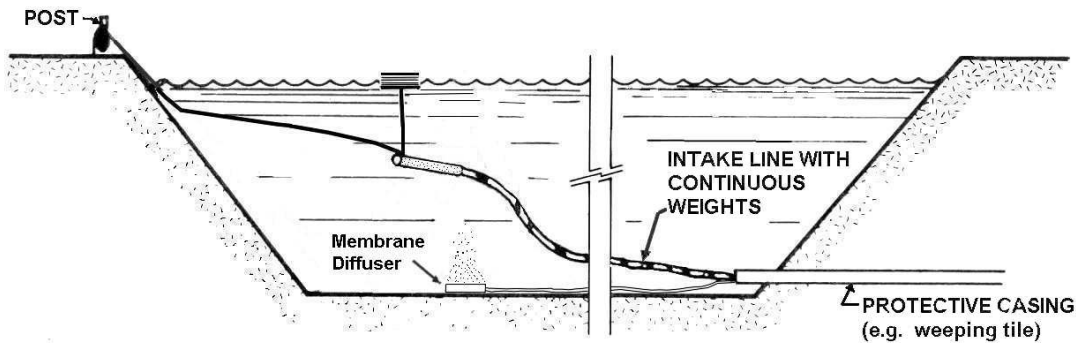


Fig. 3: SUMMER OPERATION

Operation

Because of its constant position, the intake draws water from an area 4-5 feet below the surface of the dugout. (Figure 3).

For winter operation, the intake floats under the ice level (see Figure 4).

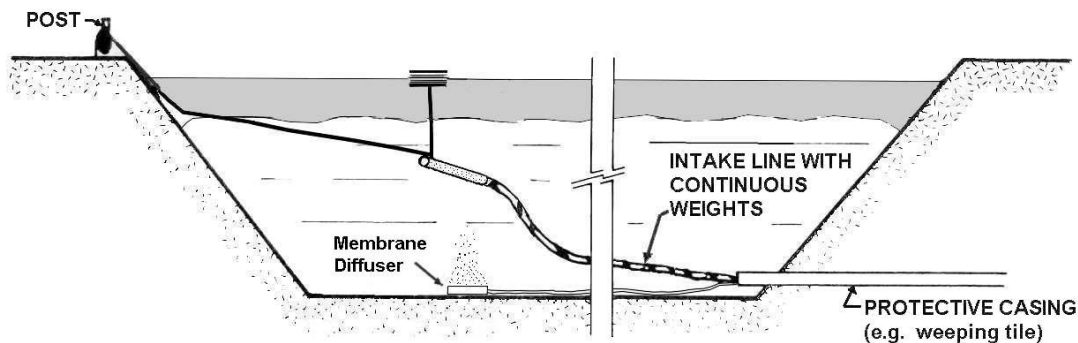


Fig. 4: WINTER OPERATION

Maintenance

Intake pipes may become clogged with foreign matter such as algae or slime. If this occurs, backwash the pipes by reversing the flow of the water. Should this fail, pull the float to shore, remove the clean-out plug and clean the pipes manually.

Continued plugging of the intake pipes may occur where dugouts require additional treatment and cleaning. All dugouts require continual maintenance of algae and weeds. (See Water Facts publication "Dugout Maintenance").

NOTE:

- **The suspended intake system should be positioned over, or near, the aeration system to prevent the float assembly from being frozen into the ice during break-up.**
- The mineral content of the water (hardness or iron content) will gradually increase during winter as the ice thickens because ice is virtually free of minerals.

NOMINAL PIPE DIA.		METRIC CONVERSIONS	
mm	inches	FLows	WEIGHTS
3	1/8	1 Imp. Gal. = 4.546 litres	1 oz. = 28.35 g
6	¼	1 U.S Gal. = 3.785 litres	1 lb. = 0.4536 kg
10	3/8		2.2 lb. = 1 kg
12	½		
20	¾	DIMENSIONS	PRESSURE
25	1		
32	1 ¼	1 in. = 25.4 mm	1 psi = 6.895 kPa
40	1 ½	= 2.54 cm	
50	2	1 ft. = 0.3048 metres	
75	3	3.2808 ft. = 1 metre	
100	4		POWER
150	6		
200	8		1 hp = 0.7457 kW
300	12		1 kW = 1.34 hp

For further information, please contact your Regional Farm Water Source Technologist at one of the following locations:

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