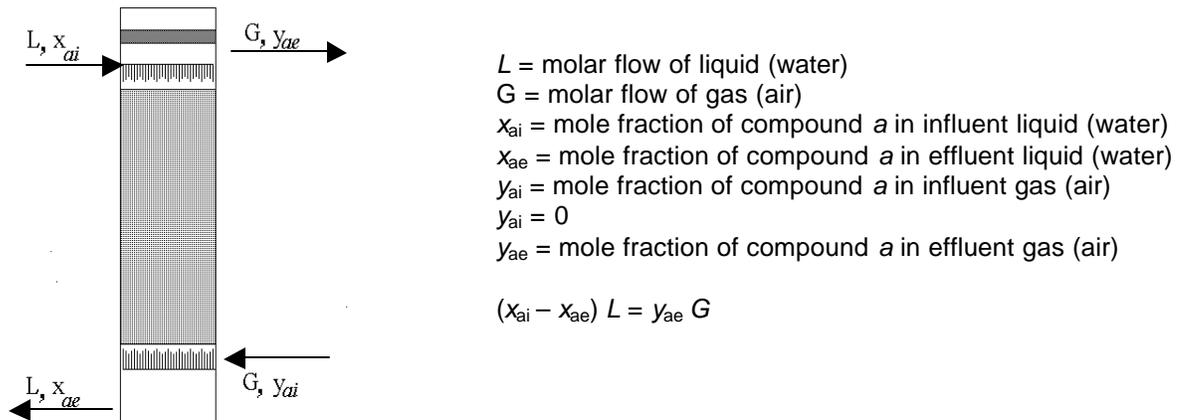


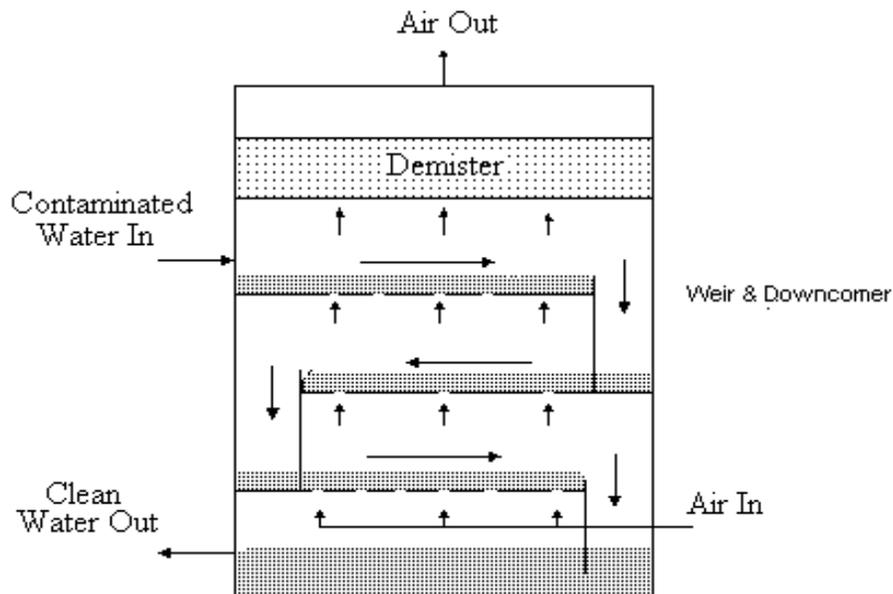
## CHAPTER 2 DESCRIPTION OF AIR STRIPPERS

**2-1. Packed Column Air Strippers.** Air strippers provide contact between air and water that encourages volatile materials to move from the water to the air. A packed column air stripper consists of a cylindrical column that contains a water distribution system above engineered (structured or dumped) packing with an air distributor below (see Figure 2-1). Water containing VOCs is distributed at the top of the column and flows generally downward through the packing material (Treybal, 1980). At the same time, air, introduced at the bottom of the column, flows upward through the packing (countercurrent flow). The packing provides an extended surface area and impedes the flow of both fluids, extending the contact between them. As water and air contact, VOCs move from the water to the air. The water leaves the bottom of the column depleted of VOCs. The VOCs transferred to the air exit the top of the column in the air stream. Off-gas (air) is released to the atmosphere or treated if necessary to meet emission limits. Detailed information on packed column air strippers is available in the literature (Kavanaugh and Trussell, 1980; Montgomery, 1985; Treybal, 1980).



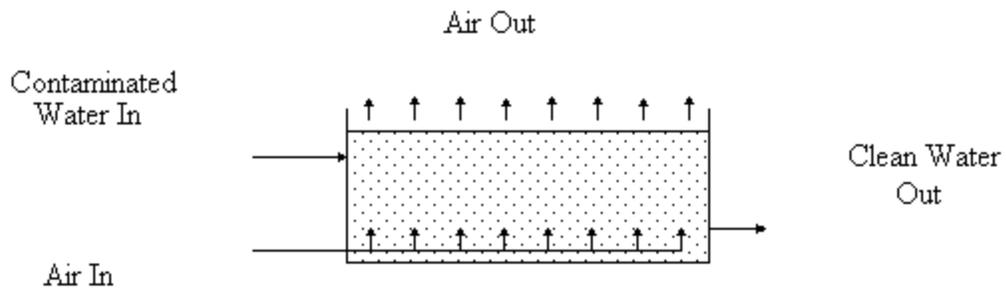
**Figure 2-1. Packed column air stripper.**

**2-2. Sieve Tray Air Stripper.** Sieve tray air strippers operate in a similar way to packed column air strippers (Figure 2-2). The difference is that the liquid (water) flows across trays that are perforated with small holes, over a weir, and through a downcomer, to the next lower tray, tray by tray, until the treated water flows from the bottom of the stripper. Gas (air) is bubbled through the holes in the trays, stopping the liquid from dripping through them. The VOCs are transferred from the liquid to the gas phase as the air is bubbled through the water on the trays. Detailed information on sieve tray units is available in the literature (Treybal, 1980).



**Figure 2-2. Low profile sieve tray air stripper.**

**2-3. Diffused Aeration Stripper.** A diffused aeration stripper is a vessel or liquid (water) reservoir with gas (air) diffusers near the bottom (Figure 2-3). Air enters through diffusers and rises through the liquid to exit at the top of the vessel. The VOCs move from the water to the air as the bubbles rise through the water. Transfer of the VOCs from the water to the air can be improved by increasing the vessel depth or by producing smaller bubbles. The air path through the liquid is straight and contact between the air and water is short. Therefore, diffused air is not efficient. Its main advantages are that it is simple and that it can handle water having high levels of suspended solids. Information on diffused aeration is available in the literature (Kavanaugh and Trussell, 1980; Patterson, 1985).



**Figure 2-3. Diffused aeration air stripper.**