



Why Your Discharge May Be Blocked

Blocked discharge is the most frequent cause of piston pumping failure. Liquid must be expelled at the rate it is pumped, or the resulting back pressure will first reduce effectiveness and then damage or even destroy your pump system.

There are five primary causes of blocked or inadequate discharge. The discharge pipe may be:

- 1) Closed, usually by mistake.
- 2) Damaged during installation or by field equipment.
- 3) Too small to handle the number of connected pumps.

Solutions here are obvious – open the pipe, repair the pipe, and either reduce the load or increase the pipe capacity.

The two other causes are less-widely understood but prevalent nonetheless. The pipe may be:

- 4) Obstructed by carbonate crystallization or other solids.
- 5) Obstructed by air locks (large bubbles of air in the pipe).

The culprit here is air/oxygen.

Why air?

Crystallization. Leachate generally is low in oxygen before pumping. When it mixes with new sources of oxygen introduced in the well or in discharge, calcium carbonate $\text{CaCO}_3(\text{s})$ may form often along with carbonates of magnesium, iron or other metals, depending on the leachate's composition. Carbonate crystals can grow and clog discharge pipes and other parts of the system.

Air locks. Air is a danger in a pressurized discharge line. Being lighter than leachate, air bubbles gravitate to system high points and become trapped. If air/oxygen continues to leak into the line, pockets form that may both restrict liquid flow and promote corrosion of pipes and fittings. As the pockets grow, restriction increases, creating destructive back pressure. Air locks eventually may block the pipe, stopping all discharge.

No air in well with Blackhawk

Blackhawk top-head-drive piston pumps are designed so that pneumatic air does not come into contact with the fluid being pumped. All power and motor mechanicals are cleanly above the wellhead. Air never enters the well or discharge pipe because pneumatic inputs and vents are mounted on the drive cylinder outside the well or sump.