FracCure
Turbine Aeration

Benefits of Dissolved Oxygen in Frac Water Remediation

Mechanical aeration of water in frac pits is an effective, low cost, and low-maintenance way to improve the quality of water for disposal or recycling. Aeration has long been used in both municipal and industrial applications to efficiently remove unwanted water contaminants. Aeration also helps stabilize the pH of corrosive waters for a wide range of flows.

When frac fluid is injected into a formation, it can pick up contaminants naturally present such as calcium bicarbonate, magnesium sulfate, strontium, sodium chloride, iron, and barium. In addition, the returning fluid contains heavy metals, soap, radiation and other contaminants.

When sufficient amounts of dissolved oxygen are introduced into the flow-back water and allowed adequate contact time, the frac water changes from an anaerobic to aerobic state. The treatment process then follows two pathways. First, the dissolved oxygen "kills" anaerobes such as sulfate reducing bacteria (SRB.) In turn, the dissolved oxygen supports the growth of aerobes that will "digest" any floating or subsurface hydrocarbons, bringing clarity to the water. Second, the dissolved oxygen transforms solids such as iron and manganese to their oxidized states which allows them to be removed or else settle to the bottom of the pit.

Oxygen also is known to oxidize dissolved contaminants such as hydrogen sulfide. It can remove volatile gaseous compounds such as ammonia and carbon dioxide.

Frac water returning from the formation is often rendered unsuitable for recycling due to emulsions and sludges. These byproducts are normally formed by the metabolic activity of ubiquitous sulfate reducing bacteria.

.

FracCure LLC
13501 Ranch Road Suite 103
Wimberley, TX 78676
info@fraccure.com 800.801.6685 www.fraccure.com

FracCure
Turbine Aeration

Frac pits quickly become anaerobic, meaning they contain very little free oxygen, because of heavy biological oxygen demand brought about by hydrocarbons and treatment chemicals. The oxidative demand in the frac pit can be so high that certain treatment chemicals are oxidized and rendered somewhat ineffective. A high level of dissolved oxygen would reduce this oxidative demand.

The frac pit, being a local, controlled lagoon provides a suitable environment for both physical and chemical remediation. As such, the frac pit can and should be at the heart of the treatment process for the recycling of frac water. The pit is the logical place to look for improvements in process performance and cost control. With the installation of efficient, durable aerators in the frac pit, the water can be treated to the point that treatment chemicals can be more effective. Specifically, biocides can be more effectively used to kill slime forming aerobic bacteria as the frac water is re-injected into the formation.

The key to aeration is efficiency and contact time. While many aeration technologies exist, most of them have poor oxygen transfer efficiencies or else require too much contact time to be of practical use. FracCure's air turbine, pictured above, is a self-aspirating aerator that has one of the highest transfer efficiencies in today's market.

.

FracCure LLC
13501 Ranch Road Suite 103
Wimberley, TX 78676
info@fraccure.com 800.801.6685 www.fraccure.com