

Oxygen Release Compound, ORC®

Iron Fouling

Given the fact that ORC produces both oxygen and an elevated pH there is a concern for iron fouling that will interfere with oxygen distribution. The degree to which this becomes an issue is a function of several things including, 1) the amount of soluble (ferrous) iron present, 2) the pH of the aquifer, 3) the fate of precipitated iron and 4) the ability to rehabilitate a problem should it arise. Also, it must be recognized that if the soluble iron is excessive and generates difficulties in an oxygenated environment, then any technology that attempts to foster aerobic bioremediation may become problematic as has been observed with air sparging.

Given the choices to provide oxygen in such an environment, ORC would have a distinct advantage in that it generates small amounts of oxygen over an extended period of time and would therefore minimize any potential problems. Also, iron hydroxide precipitates would have a tendency to deposit on the ORC filter sock which provides a mechanism to "capture" and remove them. Unless the sock is literally "electroplated" with metals, which is not likely, this process would not interfere with oxygen release. The precipitates can form directly at a higher pH, and thus be removed with the ORC. In the vicinity of the ORC, the pH will increase depending on the buffering capacity of the water.

In measurements with tap water in a closed system, the pH increases to about 9 inside the filter sock and drops to 7.5 to 8 a few inches from the outer edge of the material. Field data from the University of Waterloo study indicate that pH is restored to ambient values between 1 and 1.5 meters from the source.

The conclusion drawn from both theoretical calculations and the field results to date indicate that, regardless of the precipitation mechanism, only a minor amount of ferric hydroxide will form in a high iron aquifer under the influence of ORC, and it will largely do so on the surface of the removable ORC filter sock.

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