



The Aquaiox Advantage





## Background

Anolyte and Catholyte solutions have been used in various manners for the stimulation and enhancement of oil and gas production. Most recently, Anolyte has proven to be an extremely effective, green biocide for oilfield use. Bore-hole yield reduction is related to biological activities, mainly the formation of sessile bacteria, resulting in biofilm attached to fracture walls, inside the gravel pack, inside screen section and inside the borehole. Fresh water shortages and rising costs of disposing produced water drive well-operators to use brackish or recycled produced water whereas higher concentration of dissolved salts may interfere with chemicals and increase corrosion and scaling. Aquaiox Anolyte™ and Aquaiox Catholyte™ blends are formulated to meet individual project requirements and replace hazardous, corrosive chemicals while micro-organisms are safely eradicated.



### Regulation and Environmental Concerns

Highly resistant pathogens easily survive downhole ... Apart from yield reduction in boreholes, biofilms will promote corrosion of ferrous and other metals. Standard cleaning procedures using strong chemicals will not be able to destroy the barrier and cause only a temporary destabilization and dispersal of the biofilm. Adding a biodegradable biocide blended with Aquaiox Catholyte™ reduces friction properties in frac or recycled produced water allowing excellent penetration properties and the removal of bioslime.



### Safety and Quality

The use of Aquaiox Anolyte™ to treat producing wells has proven effectively in removing sulfur and iron reducing bacteria from sour wells and has dramatically reduce corrosion of strings and tubing downhole. This also provides for reduced methane hazards, increased production and higher value per barrel.



### Time is Money

Hydrogen sulfide present in sour wells is a harsh environment for metal, causing pitting in rods and holes in tubing. Failure of the string requires replacement, resulting in lost production and additional labor. As a result of the reduction of Hydrogen Sulfide and iron reducing bacteria, Aquaiox Anolyte™ significantly increases the life of the string and reduces operation costs without the use of any chemical corrosion inhibitors.





## Aquaiox Advantage

### Customized Anti-Microbial Blends and Formulations

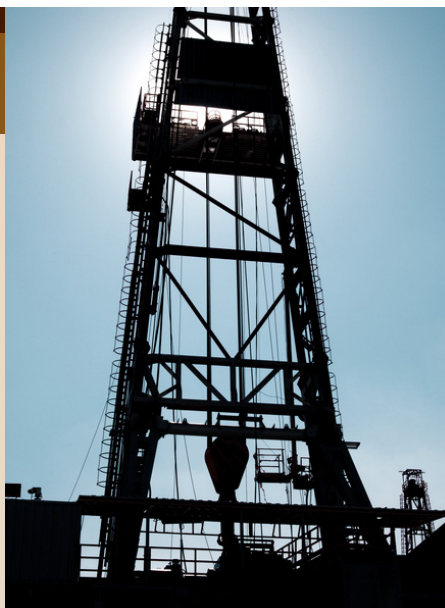
Aquaiox Anolyte™ is a novel, non-toxic electrochemically generated Hypochlorous acid (HOCL) solution that is used as a green clean biocide compatible with other chemicals. Aquaiox Catholyte™ is a novel, non-toxic electrochemically generated Sodium Hydroxide (NAOH) solution that is used as cleaner and friction reducing agent compatible with other chemicals.

#### Electro-Chemistry

As voltage is applied to the electrolysis cell, salt becomes disassociated and the separated sodium ions migrate to the cathode and the chloride ions move to the anode. Within the electrolysis cell, water becomes disassociated. Water is broken into hydrogen ions and hydroxyl ions. At the cathode, sodium ions bond with hydroxyl ions forming Aquaiox Catholyte™, an alkaline cleaning compound consisting of Sodium Hydroxide with very low friction properties. At the anode, chloride ions bond with hydrogen ions and ions of oxygen to forming Aquaiox Anolyte™, a powerful biocide consisting of Hypochlorous Acid.

### WELL REMEDIATION

- As a well treatment biocide, periodic addition of Aquaiox Anolyte™ will significantly reduce Hydrogen Sulfide, increase API gravity and the value of crude by 5 to 20%.
- Aquaiox Anolyte™ reduces corrosion and therefore usage of chemical corrosion inhibitors.
- No Hydrogen Sulfide means increased safety, less maintenance, less downtime and more production.



### BIOFILM REMOVAL

As a biocide for produced water various blends made of Aquaiox Catholyte™ and Aquaiox Anolyte™ have been proven effective in treating oil and gas transmission lines, as well as Hydrocarbon storage facilities due to its ability to eliminate biofilm and biomass; therefore improving production rates.



### WATER BIOCIDES

As a frac water biocide, Aquaiox Anolyte™ is extremely efficacious and cost effective in treating varying degrees of all micro-organisms found in source water. Loading rates, strength and pH of Aquaiox Anolyte™ may vary, dependent upon the quality of the source water as Aquaiox Anolyte™ is easily customized to meet those specific needs.



The AquaOx Advantage

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