RTA Systems, Inc.
2008 Proposal to the
Stripper Well Consortium

Soil Amendment Product For Oil Field Brine Contaminated Soil

PUBLIC EXECUTIVE SUMMARY

Salt contamination of soils is a serious environmental issue facing the oil and gas industry today according to many Stripper Well Operators and Regulators. Salts, particularly sodium chloride, from produced water spills and leaks can completely devastate surrounding vegetation. Remediating sodium affected soils is a time consuming, frequently ineffective and an expensive process. Dig and haul is an expensive operation and carries with it a Superfund risk potential. Today, there is much more emphasis on operating in an environmentally conscious manner. The problem lacks a suitable solution with the benefits of being dependabile, fast, easy and economical.

The sodium ion is detrimental due to its toxic effect on plants and devastation to soil. The chemical change brought about is an ion exchange reaction where the calcium and magnesium in clays are exchanged for sodium. This reaction causes the clay particles to swell, reduces the soil pore space and the water permeability of the soil making it difficult to purge or flush the sodium from the plant root area. In effect, the soil becomes dense and highly erodible

Using gypsum alone or with fertilizer is usually insufficient to promote grass vegetation on soils that have been badly damaged by produced water spills or leaks. Gypsum solves only part of the problem and because of its low water solubility, a lengthy time is required to exchange the calcium for sodium on the clay particles.

The proposed technology is designed to enhance oil field aesthetics for new and old produced brine water contaminated sites. The proposed solution may offer a faster, easier and cost-effective way to remediate salt damaged soils. RTA's soil amendment product has a component that would assist the calcium amendment by 1) Tying up excess sodium in the clays from the root area, 2) Providing organic material to the soil, 3) Assisting in rejuvenation of the bacterial population, and 4) Participating in nutrient transport into the plant. Using this primary component may reduce the amount of calcium amendment (gypsum) required because of its ability to tie up sodium and hence speed up the process. The product will also tie up heavy metal contamination and absorb low levels of light hydrocarbon contamination. The RTA product will be formulated with other components that restore the clay, improve water wetting, provide plant disease resistance and strengthen the plant scleried tissues.

The proposed technology would require a calcium amendment be added to the soil first, perhaps one that is more water soluble, followed by the fertilizer and the new RTA product. These amendments require watering into the soil and probably a shorter time period before the grass can be planted and re-established.