

**THE POTENTIAL FOR BORON PHYTOTOXICITY IN PRODUCED WATER  
CONTAMINATED TALLGRASS PRAIRIE SOILS**

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Identification of potential brine-induced, elemental phytotoxins that could persist in the soil after a successful removal of the sodium chloride salt could expose the shortcomings of current remediation protocols. Awareness of these phytotoxins provides another parameter with which restoration efficacy can be assessed. This paper describes the analysis of 21 soil samples and 3 produced water samples collected in the Tallgrass Prairie Preserve in Osage Co., OK. The soil samples represent a spectrum of brine contamination. Of the elements identified in brine-impacted soils using inductively-coupled plasma mass spectrometry, most appeared to follow the trend of the salt component of brine, i.e. higher concentrations were found in non-remediated sites relative to remediated sites. Historic brine scars typically contained the highest levels of both salt and identified elements, while pristine soils had the lowest. One identified element, however, did not follow this trend. Boron levels remained elevated in all impacted soils, with the exception of those derived from unimpacted prairie. It appears that boron, a known phytotoxin, did not respond to the remediation techniques employed at these sites and thereby persisted in the soil after the removal of salt. Boron-specific analyses of soils and brine are currently in progress.