Use of Green Methods and Applications to Destroy Toxic Organics and Inorganic Compounds in the Environment

- Problem: (1) Develop a method of remediating or destroying various organic and inorganic environmental toxins in the subsurface and in water, (2) Utilize pre-existing EPA green synthesis technology to further improve VeruTEK's green remediation and treatment technologies.

- Description: From experiments originating in EPA laboratories, new applications and methods have been developed that are more environmentally friendly. This project combines the EPA's expertise in green synthesis of nanoparticles with the VeruTEK's expertise with surfactant enhanced in situ chemical oxidation and reduction methods.

- Impact: The Cooperative Research and Development Agreement (CRADA) between the EPA and VeruTEK will provide:
  - Production of nanoiron using various plant extracts and iron sources
  - Catalytic activation of hydrogen peroxide
  - Destruction of contaminated soils

- IP Position: VeruTEK filed a provisional U.S. Patent with co-inventors from the EPA in 2008. The project covers the method of synthesis of metal nanoparticles using plant extracts and their application as catalysts for oxidation reactions, and also as reductants to treat organic and inorganic chemicals.

- Technology Status: The CRADA reinforces the collaboration between the EPA and VeruTEK and will greatly enhance how nanoscale technologies are applied for site remediation's. It is anticipated that using the new greener synthetic pathways, the cost of nanoscale iron and other nanoscale metals will be reduced, along with the elimination of toxic byproducts often generated in the process.

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