



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2004NH31B

**Title:** Use of Male Specific Bacteriophage as an Indicator For the Presence of Hepatitis A Virus in Alkaline Stabilized Biosolids Intended for Land Application

**Project Type:** Research

**Focus Categories:** Treatment, Methods, Toxic Substances

**Keywords:** Biosolids, Indicators, bacteriophage MS-2, Hepatitis A

**Start Date:** 03/01/2004

**End Date:** 02/28/2005

**Federal Funds:** \$22,945

**Non-Federal Matching Funds:** \$72,123

**Congressional District:**

**Principal Investigator:**

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### Abstract

The routine examination of alkaline treated biosolids for the examination of viral pathogens according to the 503 regulations is a time consuming, labor intensive process which is very costly and slow to provide results, sometimes taking up to 4 weeks. An alternative organism, one which is relatively easy to assay, relatively inexpensive and rapid to provide results would act as a good surrogate for the overall monitoring of biosolids prior to their land application.

Indicator organisms are certain species of organism believed to indicate the presence of a larger set of pathogens that may be present in a given sample. Fecal coliforms are used as the indicator organisms in the Part 503 Rule to classify Class A biosolids and to determine their health hazards. Fecal coliforms are also used to indicate wastewater treatment efficiency and are measured to determine if bacteria have repopulated when Class A biosolids are stored before land application. We have found that there does not exist a correlation between the presence of fecal coliforms and enteric viruses found in biosolids (Brabants and Margolin, 2003).

We have also found that biosolids evaluated for certain enteric viruses according to the 503 Rule often go undetected (Chaprone et. al., 2002). There are several reasons for this,

but predominately viruses such as rotavirus, adenovirus and hepatitis A virus could not be cultivated at the time of the development of the 503 Rule. However, since the development of the rule, there have been many advances in virology and we are now able to cultivate and detect these viruses in cell culture.

The major goal of this research is to evaluate the use of bacteriophage MS-2 as an indicator for the inactivation of Hepatitis A virus. We propose that hepatitis A will be inactivated under liming conditions more rapidly than bacteriophage MS-2.