

Acquisition of Real-Time PCR Equipment for the Quantification of Environmental Pathogens

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Justification:

The purpose of this equipment grant is to obtain quantitative, real-time PCR equipment for the detection and quantification of pathogens in stormwater, surface and ground water. It is our long-term goal to protect surface and ground water supplies from environmental pathogens. This grant improves current projects exploring the connection between stormwater and ground-water quality, enabling analyses of environmental pathogens. Pathogens present in stormwater runoff may pose a significant threat to ground-water supplies during infiltration following wet-weather events.

Objectives:

Research projects supported by the acquisition of this equipment are aimed at studying the occurrence, transport and viability of pathogenic organisms in susceptible water bodies, including *Cryptosporidium*, *Giardia*, *Escherichia coli*, and enteroviruses. New projects that are being developed as a result of the RT-PCR equipment are as follows:

1. Evaluation of infiltrating stormwater runoff as a source of pathogen contamination to ground water
2. Development of portable, point-of-use technologies for rapid pathogen detection
3. Identification of appropriate indicators for microbial pathogens
4. Microbial source tracking to identify potential sources of waterborne pathogens in the Schuylkill River Watershed
5. Risk assessment of waterborne pathogens in the Schuylkill River

Progress to date:

The equipment has been purchased and installed, and training has been completed. The project team is currently optimizing experimental protocols, quantifying the concentration of select pathogens and indicator organisms in stormwater detention basins and roof runoff, and tracking waterborne pathogens in the Schuylkill River Watershed.

Impacts:

With this equipment, the PD will obtain preliminary data necessary to become competitive for future funding opportunities exploring the occurrence, transport and viability of pathogenic organisms in susceptible water bodies. Accurate quantification of environmental pathogens in natural water sources opens the door to comprehensive field studies exploring the sources, fate and transport of pathogens in our integrated water supply system.