

**ITRC PROJECT PROPOSAL:****Sustainable Storm Water Management for Contaminated Sites****PROPOSAL DATE:**

6/27/08

**Proposal Contact:**

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**Problem Statement (why is this project necessary?)**

The remedial alternative selected for many contaminated properties often includes use of engineering controls, such as capping with impervious materials, e.g., landfill caps, parking lots, buildings, etc. The goals of impervious capping are to prevent exposure to the contaminated materials and to minimize surface water infiltration impact on the contaminated materials beneath the cap (i.e., ground water contamination and contaminant migration). While impervious capping accomplishes these goals, it also creates an additional environmental issue that must now be addressed, namely storm water management.

The management of storm water is a major challenge for the Department of Defense and the rest of the regulated community. In 2007, the Department of the Navy issued a Low-Impact Development Policy for storm water management requiring Naval and Marine Corps installations to consider low impact development techniques that maintain or restore redevelopment hydrology. It requires installations to utilize strategies that infiltrate, filter, store, evaporate, and/or retain runoff close to its source. The policy also requires Navy/Marine Corps installations to reduce reliance on aging storm water management infrastructure.

EPA has determined increased investment and innovative management practices will be necessary to reduce a multi-billion dollar funding gap in storm water and wastewater infrastructure. To help address this, EPA launched the Sustainable Water Infrastructure (SI) initiative. This initiative focused on four priorities which include sustainability and smart growth approaches to storm water management. Additional information on this initiative is available at [www.epa.gov/waterinfrastructure](http://www.epa.gov/waterinfrastructure).

Appropriate and sustainable management of storm water is necessary for many reasons. Specifically the contaminants in storm water must be treated in order to protect surface water quality, sensitive habitats, drinking water sources, etc. Improperly managed storm water can cause increased flood peaks, more frequent flooding, stream widening and erosion and increased stream temperatures.

There are various ways to “manage” storm water. One way is to avoid or minimize the use of

impermeable or impervious surfaces. This can be difficult to accomplish when contaminated sites are reused (i.e., brownfield redevelopment sites) because conventional regulatory thinking requires the use of impermeable caps, if contamination is left in place. This project will provide information on the use of permeable “membranes”, which allow water to pass, but contains contaminants. For example, permeable caps have been used at municipal solid waste landfills, allowing for increased rates of natural degradation of landfill waste while improving the rate of water reuse. The application of this concept will be investigated for use at other types of sites.

If the use of impermeable or impervious surfaces cannot be avoided, or for sites where an impermeable cap or impervious surfaces are already in place (e.g., buildings, parking lots) then the best way to manage storm water is in a sustainable way. This project will provide information on sustainable storm water management techniques, focusing on the reuse of storm water, sustainable landscaping including porous pavement, engineered/constructed wetlands, bioretention areas, etc. The team will determine which sustainable storm water management technique, or combination of techniques, is appropriate for various types of sites, types of contaminants, levels of contaminants and contaminated media involved.

In addition, if SMARTe is funded by EPA in 2009, members from EPA and their contractors will be members of the team. The team will provide case studies and all the information related to the project for use as a sustainable storm water management component to SMARTe. Since storm water management is one of the critical components of any brownfield redevelopment project, this project will be a very useful addition to SMARTe.

Storm water management strategies promise to play a more significant role, as it relates to water reuse, in determining future green building accreditation scoring (e.g. LEED™ New Construction). The U.S. Green Building Council (USGBC) is in the process of increasing the weighting of LEED™ accreditation scoring for design and implementation of net zero water consumption practices. The transition has begun to this new LEED™ scoring version (v 3.0) and will be published more formally in the Fall 2008.

To summarize, this project will focus on the following:

- Evaluation of the use of permeable engineered controls, as opposed to impermeable engineered controls, to protect human health and the environment while preventing or minimizing storm water.
- Evaluation of sustainable storm water management techniques that can be used at properties where impermeable engineered controls must be used or where impervious surfaces already exist.
- Development of a storm water component for SMARTe, if SMARTe is funded by EPA.

**Solution / Impact** (how will the project impact the environmental marketplace?)

This project supports ITRC’s Mission to develop information resources and help break down barriers to the acceptance and use of technically sound innovative solutions to environmental challenges through an active network of diverse professionals.

This project supports the Strategic Element: We will look ahead to future environmental challenges and be ready to focus our resources on developing innovative solutions to address those challenges.

The federal and state environmental regulatory agencies continue to better understand how to support sustainable practices on contaminated properties. This project will continue to help forge a better

appreciation of the challenges to approve and implement more innovative non-permanent site remedies that do not create a new storm water management issue. One goal is to enhance communication between site remediation and storm water groups within state agencies. Not only will this enhanced communication benefit the regulators, it will benefit the parties conducting remediation.

In addition, the Tech-Reg guidance document will be a resource of information on storm water management that will assist regulators, parties conducting remediation, and developers in determining the most effective, sustainable way to manage storm water.

#### **Success Measures** (how you determine the project impact to the market place)

There are two objectives of this project. The first objective is to make remediation project managers aware of storm water issues and factor storm water management into their decisions regarding remedial actions. The second objective is to provide a resource on sustainable storm water management techniques. Success measures would include:

- Including a storm water management evaluation as part of the remedy selection process
- Use of sustainable storm water management techniques
- Number of states concurring on Tech-Reg document
- Number of participants taking training course

#### **Summary of Deliverables** (primary project outputs)

Consistent with the project focus the group intends to produce a Tech-Reg guidance document. Specifically, the Tech-Reg will provide an evaluation of the use of permeable engineered controls, as opposed to impermeable engineered controls, to protect human health and the environment while preventing or minimizing storm water. In addition, it will provide an evaluation of sustainable storm water management techniques that can be used at properties where impermeable engineered controls must be used or where impervious surfaces already exist. Case studies will be included in the document.

For SMARTe, a storm water component will be created based on the Tech-Reg information, including case studies.

#### **Project Schedule**

- 2009 – Build the team knowledge by reviewing case studies, literature reviews, and technology reviews to identify and evaluate sites where permeable caps were used or sustainable storm water management technologies are used. Evaluate sustainable storm water management technologies.
- 2010 – Develop a Tech-Reg guidance document and associated Internet-based training
- 2011 and 2012 – Implementation and internet-based training

## Target Audience

Primary Audience: The primary audience will use the Tech-Reg as part of their decision-making process regarding storm water management. The Tech-Reg can be used to evaluate innovative ways to handle existing storm water issues and can also be used in determining whether a permeable cap may be an appropriate remedy for a contaminated site, thereby lessening the need for storm water management.

The Primary Audience will consist of the following: State and Federal regulators; DoD, DOE and private industry project managers; and environmental contractors and consultants.

The Secondary Audience will use the Tech-Reg for information or education purposes.

The Secondary Audience will consist of the following: Brownfield site developers, local government agencies, and interested stakeholders.

The target audience for SMARTe is regulators, environmental consultants, private industry project managers and members of the community.

## Resources Required

### Personnel:

**Team Leader:** Gwen Zervas (NJDEP)

### Supporting State Members:

The following states have committed to provide members to the team:

California

Colorado

Massachusetts

Pennsylvania

South Carolina

### Skill Mix of Team Members (e.g. regulatory, engineering, scientific, etc.)

Scientific - Engineers, Environmental Scientists, Hydrogeologists

Regulatory – Storm water Regulators, Brownfield Project Managers, Superfund/RCRA Project Managers

Educational - New Jersey Institute of Technology

### Sectors of Team Members (e.g., federal, state, community, regulated, regulator, etc.)

IAP representatives - Brown and Caldwell, Kleinfelder, Tetra Tech

Federal representatives – AFCEE, EPA

State representatives (stated above)

Community stakeholder – Trenton, NJ representative

**Related Work:**

The ITRC teams that have done work that may relate to storm water management include Alternative Landfill Technologies (i.e., Alternative Landfill Covers and Bioreactor Landfills may provide information on how these technologies/concepts can be applied at other remediation sites to avoid storm water management issues); Attenuation Processes for Metals and Radionuclides; and Phytotechnologies.

Some work has been done by other organizations on innovative storm water management and this work will be thoroughly researched, referenced, and incorporated as needed.

Regarding SMARTe, ITRC Brownfields Team was working on this project. This proposed project team will fulfill the Brownfields Team role with regards to SMARTe.