

ITRC PROJECT PROPOSAL: SCM Team – Mass Flux as a Performance Metric

PROPOSAL DATE: 5-17-2007

Proposal Contact:

Stu Nagourney, (609) 292-4945, stu.nagourney@dep.state.nj.us

George Hall, (918) 446-7288, ITRC@cox.net

Problem Statement (why is this project necessary?)

Mass flux is one way to measure the performance of a remedial treatment, or to make site closure decisions. It is an extension of the commonly used metric of groundwater contaminant concentration. Mass flux measurements consist of discreet spatial and temporal measurements taken throughout the water column and integrated over a subsurface transect to give a true picture of the contaminant mass movement. Implementation of mass flux as a performance metric may require significant changes in regulations. Regulators need guidance on both the technical aspects and regulatory considerations associated with the use of mass flux as a performance metric. This is a broad issue that encompasses several facets of sampling and monitoring, and integrates well with the Team’s current efforts on sensor technologies.

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

The use of mass flux as a performance metric may be hampered by significant regulatory barriers. The current practice is that groundwater contaminant concentrations based on quarterly sampling events and laboratory analysis are used for closure decisions - this is significantly different from a performance metric based on the movement of mass across a boundary. State environmental regulations often require point source sampling and measurement at specified intervals, usually once every 3 months. Using the current practice, "flush-out" events related to high rainfall could be missed if they occur between the 90-day sampling periods. Mass flux measurements can be made using sensors to provide a near real-time data capture, thereby allowing for a true picture of contaminant mass movement. While it provides a more accurate understanding of the subsurface contaminant movement, it may require a re-evaluation of existing regulations related to site closeout or other performance measurement issues. The use of mass flux as a performance measurement may require changes in current State regulatory policies and/or regulations before it can be used.

The guidance document and associated training that the SCM Team will develop addresses the issues concerning the use of mass flux as a performance metric. The project has potential to make a significant impact within the environmental community by addressing a new performance metric that could be used in place of the existing metrics.

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

Number of students trained.
Potential regulatory changes that enable the use of mass flux as a performance metric in place of traditional concentration-based metrics.

Summary of Deliverables (primary project outputs)

- 1.) Technical/regulatory guidance document on mass flux
- 2.) Training modules

Project Schedule

Dec 2009 – Mass Flux Tech/Reg Document
April 2010 – Internet Training Module

Target Audience

Regulators and other environmental decision-makers at all levels of government, and environmental consultants.

Resources Required**Personnel:**

- The existing SCM team is already populated with a skill mix of regulatory, engineering, and scientific team members. Additional members will be recruited as required.
- Federal, state, community, and industry members currently serve on the team and are expected to continue.
- The team has state members from NJ, WI, SC, MO, CA, DE, KY, OK, MA, MI, and PA.

Financial Resources:

2008 - \$76,000
2009 - \$80,000
2010 - \$10,000

Related Work:

The evaluation of mass flux as a performance metric is a logical next step for the SCM team to take after completion of the Sensor technical/regulatory document, which is scheduled for CY 2008. ITRC has briefly examined the issue of mass flux once before. The technical/regulatory document DNAPL-5, "Strategies for Monitoring the Performance of DNAPL Source Zone Remedies," mentions it in section 4.4.3, "Decrease in Source Mass Flux." This initial work performed by the former DNAPL team provides an excellent starting point for the Sampling, Characterization and Monitoring Team's efforts. Navy researchers who are members of the Sampling, Characterization and Monitoring Team have submitted separate proposals to SERDP/ESTCP for long-term research projects dealing with mass flux.