

A Contaminant Mass Recovery Model for Electrical Resistance Heating Sites: Comparison with Actual Site Data

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Background/Objectives.

Typical operational questions faced at electrical resistance heating sites include:

- When have asymptotic conditions been achieved?
- What is the contaminant mass remaining?
- How long should operations continue to achieve a particular concentration goal?

Timely and accurate answers to these questions may help to minimize operational duration and cost. A contaminant mass recovery model is presented incorporating electrical heating, convection, heat loss, and thermal conduction, as well as vapor- and groundwater-phase contaminant transport to an extraction well. This model may be useful in providing accurate answers to the above questions at electrical resistance heating sites.

Approach/Activities. A model for contaminant mass recovery using first principles was extended by adding thermal conduction, and vapor- and groundwater-phase contaminant transport to an extraction well. This model is then compared to contaminant mass recovery data from actual sites for evaluation and calibration.

Results/Lessons Learned. Preliminary results from modeling indicate that geometric considerations alone have significant effect on contaminant mass recovery. The relative effects of vapor and groundwater mass transport will also be examined.