

## EMSOFT

**Model Uses** EMSOFT is a computer application that determines concentrations of contaminants in the soil over time, quantifies the transfer rate of the contaminants into the atmosphere and calculates the contaminant air concentrations.

**Major Categories** Water Quality; Decision Support

**Subject Knowledge Level**  
Intermediate

**Minor Categories** Concentration; Ecological Risk Assessment

**Technical Difficulty Level**  
Intermediate

**Model Type** Conceptual Model

**Geographic in Nature?**  
No

### **Abstract**

Chemicals that readily vaporize at relatively low temperatures can migrate from contaminated soils into the atmosphere via a process called volatilization. Volatilization represents a potentially significant exposure pathway because humans can come in contact with volatilized compounds through inhalation. The EMSOFT manual describes a computer screening model that may be used 1) to determine concentrations of contaminants remaining in the soil over a given time (when the initial soil concentration is known); 2) to quantify the mass flux (rate of transfer) of contaminants into the atmosphere over time; and 3) to subsequently calculate contaminant air concentrations by inputting mass flux values into atmospheric dispersion models. Ingestion of contaminated soil and dermal contact are also potential exposure pathways requiring knowledge of the contaminant soil concentration to estimate potential risks. EMSOFT can also be used by risk assessors and exposure modelers to calculate average chemical concentrations at a given depth over time. This model, based on the theory and studies of Jury et al. (1983, 1990), addresses situations in which contaminated soils are located at the surface and buried beneath a clean soil cover. Through a series of menus the user is prompted for several input choices to select a calculation method, chemical data, soil properties, and layer properties. The various calculation methods include Time-Averaged Flux, Flux vs. Time, Time- and Depth-Averaged Soil Concentration, Depth-Averaged Soil Concentration vs. Time and Soil Concentration vs. Depth. The user also has the option to determine cover layer thickness; the number of contaminant layers and their corresponding thickness; and the time period for averaging flux and soil concentration.

### **Future Developments**

Unknown

### **Model Limitations**

Unknown

### **Model Features**

Various calculation methods including:

- Time-Averaged Flux
- Flux vs. Time
- Time- and Depth-Averaged Soil Concentration
- Depth-Averaged Soil Concentration vs. Time and Soil Concentration vs. Depth

### **Required Data Types**

Through a series of menus, users select calculation methods, input soil parameters and chemical specific data, layer properties, layer thickness, number of contaminant layers and time period.

### **Model Outputs**

Calculations associated with input data are displayed through a series of screens included in the program.

### **Source**

US Environmental Protection Agency

### **Source (URL)**

<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=2862>

**Hardware Requirements**

None noted.

Supported Platforms			
DOS	<input type="checkbox"/>	UNIX	<input type="checkbox"/>
Windows	<input checked="" type="checkbox"/>	Macintosh	<input type="checkbox"/>

**Software Requirements**

None noted.

**Cost, Licensing and Availability**

Free, available from the link above.