

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Handbook for Estimating Toxic Fuel Hazards

#### The problem:

A method is needed to predict, from readily-available meteorological data, the concentration and dosage fields downwind from ground-level and elevated sources of toxic fuel emissions.

#### The solution:

A mathematical model has been made of the physical and positional characteristics of airborne substances. It includes the attributes of the atmosphere around the source of the substances.

#### How it's done:

The airborne source material is modeled by mathematical representations of concentration levels and distributions, dosage levels and distributions, height of the source cloud, decay coefficients, settling velocity, and positional parameters. Atmospheric conditions are modeled by mathematical representations of wind speed at various heights, cloud travel, standard deviation of azimuth wind angle, azimuth wind direction shear, standard deviation of wind deviation angle, and wind speed shear. Though

developed for toxic fuel emissions, the package is applicable to hot plume rise from industrial stacks and should also be of interest to air pollution meteorologists.

#### Notes:

1. The program is written in ASA FORTRAN V for the UNIVAC 1100-series machine but should execute under most high-level FORTRAN compilers.
2. Inquiries concerning this program should be directed to:

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112 Barrow Hall  
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Reference: MFS-21114

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