

DuPont Modeling Methodology and Results

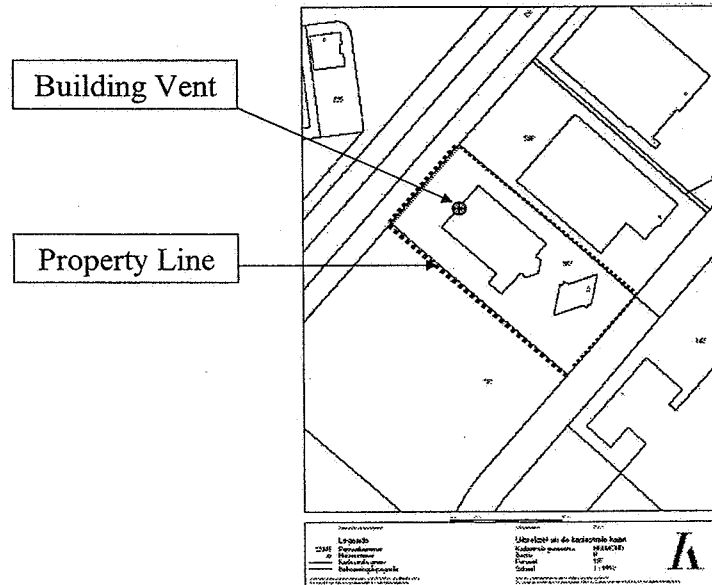
Netherlands Site

September 2004

About the Model

- Industrial Source Complex Short Term 3 (ISCST3)
- Sold/used globally, including in The Netherlands
<http://www.phoenix-r.co.jp/products/products.htm>
- Input
 - Stack height, diameter
 - Flowrate, temperature
 - Mass of pollutant (mass per time)
 - Local meteorological data (Eindhoven, 1997 - 2001)
- Output
 - Ambient air concentrations in ug/m3
 - Max values and locations outside the property line

Modeled Site



Modeling Inputs - Stack Parameters

	<u>Actual</u>
Stack Height (m)	11.26
Stack Diam. (cm)	20
Stack Velocity (m/s)	24.7
Stack Exit Temp. (°C)	100

Modeling Inputs - Emission Rate

Stack emissions given as 448 grams per hour

- Created Monthly Emissions Factor using spreadsheet from Nick Hopper
- Accounts for less than 24 hours of operation, less than 365 days per year of operation during each month:

Jan = 0.2 Feb = 0 Mar = 0.17 Apr = 0.2
May = 0.08 Jun = 0.18 Jul = 0.08 Aug = 0
Sept = 0 Oct = 0.11 Nov = 0.25 Dec = 0.15

Sample Calculation of Monthly Factor

Dates	Times worked	Hrs	Daily Mass of Emissions, gms	Monthly mass of emissions, gms	Monthly factor, assuming 448 g/hr
1/2/2003	08:00 - 16:00 hours	7	3136		
1/3/2003	08:00 - 16:00 hours	7	3136		
1/6/2003	08:00 - 16:00 hours	7	3136		
1/7/2003	08:00 - 16:00 hours	7	3136		
1/8/2003	08:00 - 16:00 hours	7	3136		
1/9/2003	08:00 - 16:00 hours	7	3136		
1/10/2003	08:00 - 16:00 hours	7	3136		
1/13/2003	08:00 - 22:00 hours	12	5376		
1/14/2003	08:00 - 22:00 hours	12	5376		
1/15/2003	08:00 - 22:00 hours	12	5376		
1/16/2003	08:00 - 22:00 hours	12	5376		
1/17/2003	08:00 - 22:00 hours	12	5376		
1/20/2003	08:00 - 22:00 hours	12	5376		
1/21/2003	08:00 - 22:00 hours	12	5376		
1/22/2003	08:00 - 16:00 hours	7	3136	62720	0.2

If operation ran continuously at 448 gms/hr for January, monthly emissions would be $448 \text{ g/hr} * 24\text{hrs} * 31 \text{ days} = 333, 312 \text{ gms}$ for Jan

Calculate a January factor = $62720 \text{ actual} / 333, 312 \text{ if continuous} = 0.2$

Preliminary Modeling Results

- Maximum annual average concentrations calculated as 0.74 ug/m³
- Point of maximum concentration at Northeastern boundary of site (on property line)
- Assumed no rain cap

Screening Values

- Screening level used at US plant site for permit compliance = 1 ug/m³
 - Represents reference concentration for inhalation health protection
 - Developed by team of independent toxicologists in 2002
 - Reference report at
http://www.dep.state.wv.us/Docs/4505_FINAL_CATT_REPOR T_8-02.pdf

Community Exposure Guideline (CEG)

In the early 1990's DuPont established a Community Exposure Guideline (CEG) of 0.3 ug/m^3 for the inhalation pathway.

- I A CEG is an exposure guideline established by DuPont's Haskell Laboratory.
- I The CEG assumes a 24-hour lifetime exposure by all, including the most sensitive individuals, in an exposed community population.
- I Exposure above the CEG will not necessarily result in any adverse effects.

