Appendix D

# Analysis of the EPA Data

## Summary

OTA examined a subset (20 chemicals) of the EPA monitoring data. Differences were noted in frequencies of detection for this subset between the emergency declaration area (EDA) and control areas. Four chemicals (1,2- and 1,3-dichlorobenzene and 2- and 4-chlorotoluene) were found to be present in the EDA at greater frequencies than the control areas. The differences were significant, but the concentrations were low.

## Statistical Analysis of Indicator Substances

OTA disaggregated the Environmental Protection Agency (EPA) monitoring data to allow an examination of a subset of "indicator substances, " toxic chemicals known to have been disposed in the canal landfill, Twenty chemicals were identified for the OTA analysis; only **16** of them had sufficient data. Frequencies of detection for the **16** substances were compared between the EDA and control areas.' The method of analysis was the Mantel-Haertszel procedure. This procedure assumes similar patterns across those media that contain one positive sample; if a chemical is found in one medium in a region, it is assumed that the chemical may be found in the other media in the same region. The finding of no detectable levels in both regions has no effect on the assumptions.

The results of Mantel-Haenszel analysis are shown in table D-5. The EDA was found to have a significantly higher frequency of positive detections than the control area for four chemicals: 1,2- and l,3-dichlorobenzene, 2- and 4-chlorotoluene. Table D-1 illustrates the results for one compound, 1,2-dichlorobenzene. A higher rate of positive samples was found in the EDA and the difference is statistically significant. * The odds of finding a positive sample in the EDA is 7.5 times greater than that for the control areas. It should be noted that no comparison can be made with six of the submedia, as no control samples were analyzed. The EPA data used in this analysis are presented in tables D-2, D-3, and D-4. EPA found significant differences for 2-chlorotoluene and 1,2-dichlorobenzene in air between EDA and control areas. It should be noted that

**Table D-l.—Odds Ratio[a] and Detection Rates for l,2-Dicholorobenzene**

| | EDA V. control area | Love Canal v. control area |
|---|---|---|
| | 7.5 (.001) | 4.2 (.05) |
| Medium | EDA | Control area |
| Shallow well. . . . . | 0.0[b] | 0.0 |
| | 47[c] | 11 |
| Deep well . . . . . | 0.04 | 0.0 |
| | 28 | 14 |
| Sump water . . . . . | 0.0 | 0.0 |
| | 104 | 4 |
| Surface water. . . . . | 0.0 | 0.0 |
| | 4 | 5 |
| Drinking water . . . . . | 0.0 | 0.0 |
| | 30 | 4 |
| Storm sewer water . . . . . | 0.11 | 0.0 |
| | 9 | 1 |
| Sanitary sewer water . . . . . | 1.00 | — |
| | 1 | 0 |
| Soil . . . . . | 0.01 | 0.0 |
| | 105 | 9 |
| Storm sewer sediment . . . . . | 0.07 | — |
| | 15 | 0 |
| Surface water sediment . . . . | 0.30 | 0.0 |
| | 4 | 4 |
| Living area air . . . . . | 0.42 | 0.10 |
| | 539 | 30 |
| Basement air . . . . . | 0.34 | — |
| | 88 | 0 |
| Outdoor air. . . . . | 0.10 | — |
| | 83 | 0 |
| Oatmeal . . . . . | — | — |
| | 0 | 0 |
| Potatoes . . . . . | — | — |
| | 0 | 0 |
| Crayfish . . . . . | 0.0 | 0.0 |
| | 31 | 9 |
| Mice . . . . . | 0.0 | 0.0 |
| | 35 | 32 |
| Worms. . . . . | 0.0 | 0.0 |
| | 19 | 5 |

[a]The odds ratio (P-value) indicates the odds of observing a sample with l,2-dicholorobenzene in one region compared to another.
[b]Frequency of samples containing 1,2-dichlorobenzene.
[c]Total number of samples analyzed.

SOURCE: Cupples, op. cit.

1,4-dichlorobenzene was found to be more frequently detected in the control areas than in the EDA. The absence of significant differences for the other compounds may be due to inadequate sampling for controls and cannot be interpreted as strong evidence that the EDA and controls are similar in levels of contamination. It should be noted that these same four chemicals were detected in leachate sludge obtained at the

[1]L. A. Cupples, Boston University School of Public Health, report submitted to OTA, Industry, Technology, and Employment Program, May 19S3.
"Significant refers to a 90-percent confidence level or greater.

## Table D-2.—Detection (+) of ndicator Substance and Numbers of Samples Analyzed (n) for Environmental Media in the Control Areas

| | Environmental media and submedia[a] | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator substance | 1 +/n | 2 +/n | 3 +/n | 4 +/n | 5 +/n | 6 +/n | 7 +/n | 8 +/n | 9 +/n | 10 +/n | 11 +/n | 12 +/n | 13 +/n | 14 +/n | 15 +/n | 16 +/n | 17 +/n | 18 +/n | 19 +/n | 20 -/n | 21 +/n | 22 +/n |
| Gamma-BHC (Lindane) | 3/11 | 3/15 | 1/5 | 0/5 | 0/5 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 3/5 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 1/33 | 0/5 |
| Chlorobenzene | 0/11 | 3/16 | 0/5 | 0/5 | 1/5 | 0/1 | 0/0 | 0/17 | 0/0 | 0/1 | 0/0 | 0/4 | 0/31 | 0/0 | 0/0 | 0/4 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 1,2-Dichlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 3/30 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 0/5 |
| 1,3-Dichlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 0/5 |
| 1,4-Dichlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 2/4 | 18/30 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 1/5 |
| 1,2,3-Trichlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 0/5 |
| 1,2,4-Trichlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 1/4 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 1/32 | 1/5 |
| 1,3,5-Trichlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 0/5 |
| 1,2,3,4-Tetrachlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 10/32 | 0/5 |
| 1,2,3,5-Tetrachlorobenzene | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 1,2,4,5-Tetrachlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 0/5 |
| Pentachlorobenzene | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| Hexachlorobenzene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/28 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/32 | 0/5 |
| 2-Chloronaphthalein | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 0/5 |
| α-Chlorotoluene | 0/11 | 0/16 | 0/5 | 0/3 | 0/5 | 0/1 | 0/0 | 0/17 | 0/0 | 0/1 | 0/0 | 0/4 | 0/0 | 0/0 | 0/0 | 0/4 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 2-Chlorotoluene | 0/11 | 0/16 | 0/5 | 0/3 | 0/5 | 0/1 | 0/0 | 0/17 | 0/0 | 0/1 | 0/0 | 0/4 | 2/30 | 0/0 | 0/0 | 0/4 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 3-Chlorotoluene | 1/11 | 2/16 | 0/5 | 0/3 | 0/5 | 0/1 | 0/0 | 0/17 | 0/0 | 0/1 | 0/0 | 0/4 | 0/0 | 0/0 | 0/0 | 0/4 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 4-Chlorotoluene | 0/11 | 0/16 | 0/5 | 0/3 | 0/5 | 0/1 | 0/0 | 0/17 | 0/0 | 0/1 | 0/0 | 0/4 | 2/31 | 0/0 | 0/0 | 0/4 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 2,4-Dichlorotoluene | 0/11 | 0/14 | 0/4 | 0/5 | 0/4 | 0/1 | 0/0 | 0/9 | 0/0 | 0/0 | 0/0 | 1/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/9 | 0/0 | 0/0 | 6/32 | 0/5 |
| α,α,2,6-Tetrachlorotoluene | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| Totals | 4/187 | 8/249 | 1/74 | 0/77 | 1/74 | 0/17 | 0/0 | 0/193 | 0/0 | 0/5 | 0/0 | 7/69 | 25/348 | 0/0 | 0/0 | 0/20 | 0/15 | 0/108 | 0/0 | 0/0 | 8/353 | 2/60 |
| Detection frequencies (%) | 2.1 | 3.2 | 1.4 | 0 | 1.4 | 0 | — | 0 | — | 0 | — | 10.1 | 7.2 | — | — | 0 | 0 | 0 | — | — | 5.1 | 3.3 |

[a]**Water:**
1) shallow well,
2) deep well,
3) sump,
4) surface,
5) drinking,
6) storm sewer,
7) sanitary sewer;

**Soil:**
8) soil,

**Sediment:**
9) sump,
10) storm sewer,
11) sanitary sewer,
12) surface water;

**Air:**
13) living area,
14) basement,
15) outdoor; and

**Biota:**
16) oatmeal,
17) potatoes,
18) crayfish,
19) dog,
20) maple,
21) mice,
22) worms.

SOURCE: US/EPA, op. cit., vol. III.

## Table D-3.—Detection (+) of Indicator Substance and Numbers of Samples Analyzed (n) for Environmental Media in the EDA

| | Environmental media end submedia[a] | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 + /n | 2 +/n | 3 + /n | 4 + /n | 5 +/n | 6 + /n | 7 + /n | 8 + /n | 9 + /n | 10 + /n | 11 + /n | 12 + /n | 13 + /n | 14 + /n | 15 + /n | 18 +/In | 17 + /n | 18 + /n | 19 + /n | 20 + /n | 21 + /n | 22 + /n |
| Gamma-BHC (Lindane) | 12/47 | 3/29 | 19/105 | 1/3 | 3/31 | 4/7 | 1/1 | 7/109 | 0/0 | 6/13 | 0/0 | 4/4 | 2/292 | 0/84 | 0/79 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0136 | 0/8 |
| Chlorobenzene | 1/43 | 2/30 | 2/104 | 0/4 | 7/31 | 0/9 | 0/1 | 3/212 | 0/0 | 3/15 | 0/1 | 3/4 | 8/540 | 1/88 | 2/83 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 1,2-Dichlorobenzene | 0/47 | 1/28 | 0/104 | 0/4 | 0/30 | 1/9 | 1/1 | 1/105 | 0/0 | 1/15 | 0/0 | 2/4 | 227/539 | 29/86 | 8/83 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 1,3-Dichlorobenzene | 0/47 | 1/28 | 2/104 | 0/4 | 0/30 | 1/9 | 1/1 | 0/105 | 0/0 | 1/15 | 0/0 | 2/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 1/35 | 0/19 |
| 1,4-Dichlorobenzene | 0/47 | 1/28 | 12/104 | 0/4 | 0/30 | 1/9 | 0/1 | 1/105 | 0/0 | 1/15 | 0/0 | 2/4 | 81/539 | 14/86 | 1/83 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 1,2,3-Trichlorobenzene | 0/47 | 0/28 | 0/104 | 0/4 | 0/15 | 2/9 | 1/1 | 0/105 | 0/0 | 0/7 | 0/0 | 1/4 | 0/292 | 0/84 | 1/79 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 1,2,4-Trichlorobenzene | 0/47 | 0/28 | O/104 | 0/4 | 0/30 | 3/9 | 1/1 | 0/105 | 0/0 | 6/15 | 0/0 | 2/4 | 6/292 | 0/84 | 1/79 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 4/19 |
| 1,3,5-Trichlorobenzene | 0/47 | 0/28 | 0/104 | 0/4 | 0/15 | 0/9 | 1/1 | 0/105 | 0/0 | 0/8 | 0/0 | 0/4 | 0/292 | 0/84 | 1/79 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| l,2,3,4-Tetrachlorobenzene | 0/47 | 0/28 | O/104 | 0/4 | 0/15 | 2/9 | 1/1 | 0/105 | 0/0 | 3/6 | 0/0 | 2/4 | 15/292 | 3/84 | 0179 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 8/34 | 0/19 |
| 1,2,3,5-Tetrachlorobenzene | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 1,2,4,5-Tetrachlorobenzene | 0/47 | 0/28 | O/104 | 0/4 | 0/15 | 2/9 | 1/1 | O/105 | 010 | 1/6 | 0/0 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/34 | 0/19 |
| Pentachlorobenzene | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 2/291 | 0/84 | 0/77 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| Hexachlorobenzene | 0/47 | 0/28 | 1/104 | 0/4 | 0/30 | 0/9 | 1/1 | O/104 | 0/0 | 1/15 | 0/0 | 2/4 | 0/292 | 0/84 | 0/78 | 0/0 | 0/0 | 1/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 2-Chloronaphthalein | 0/47 | 0/28 | 0/104 | 0/4 | 0/30 | 0/9 | 1/1 | O/105 | 0/0 | 0/15 | 0/0 | 1/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| a-chlorotoluene | 0/43 | 0/31 | 0/90 | 0/0 | 0/31 | 0/9 | 0/1 | 0/213 | 0/0 | 0/6 | 1/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 2-Chlorotoluene | 0/43 | 1/30 | 0/90 | 0/0 | 0/31 | 1/8 | 0/0 | 0/213 | 0/0 | 0/6 | 0/0 | 2/4 | 141/541 | 14/86 | 12/83 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 3-Chlorotoluene | 0/43 | 4/30 | 0/90 | 0/0 | 0/31 | 1/8 | 0/0 | 0/213 | 0/0 | 0/6 | 0/0 | 2/4 | 0/0 | 0/0 | 0/0 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 4-Chlorotoluene | 0/43 | 1/30 | 0/90 | 0/0 | 0/31 | 1/8 | 0/0 | 0/213 | 0/0 | 0/6 | 0/0 | 2/4 | 69/541 | 12/86 | 7/83 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 2,4-Dichlorotoluene | 0/47 | 1/28 | 0/104 | 0/4 | 0/15 | 1/9 | 1/1 | O/104 | 0/0 | 0/9 | 0/0 | 1/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 5/31 | 0/0 | 0/0 | 0/35 | 3/19 |
| a,a,2,6-Tetrachlorotoluene | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| Totals | 13/779 | 15/448 | 38/1,673 | 1/51 | 10/441 | 20/148 | 11/14 | 12/2,328 | 0/0 | 23/167 | 1/2 | 28/67 | 451/4,737 | 73/1,018 | 33/965 | 0/65 | 0/80 | 6/372 | 0/0 | 0/0 | 9/419 | 7/217 |
| Detection frequencies (O/.) | 1.7 | 3.1 | 2.2 | 2.0 | 2.3 | 13.5 | 78.6 | 0.5 | 0 | 13.8 | 50.0 | 41.8 | 0.1 | 7.2 | 3.4 | 0 | 0 | 1.6 | 0 | 0 | 2.1 | 3.2 |

[a] Water
1) shallow well,
2) deep well,
3) sump,
4) surface,
5) drinking,
6) storm sewer,
7) sanitary sewer;

soil:
8) Soil,

Sediment:
9) sump,
10) storm sewer,
11) sanitary sewer,
12) surface water;

Air.
13) living area,
14) basement,
15) outdoor; and

Biota:
16) oatmeal,
17) potatoes,
18) crayfish,
19) dog,
20) maple,
21) mice,
22) worms.

SOURCE: US/EPA, Op. cit., vol. III.

## Table D-4.—Detection (+) of Substances Not Found in Control Areas and Numbers of Samples Analyzed (n) for Environmental Media in the EDA

| Indicator substance | Environmental media and submedia[a] | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | + /n | + /n | + /n | + /n | + /n | + /n | | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n | + /n |
| 2-Chlorophenol | 0/47 | 1/27 | 0/104 | 0/4 | 0/30 | 0/9 | | 0/1 | 0/104 | 0/0 | 0/15 | 0/1 | 1/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 4-Chlorophenol | 1/35 | 3/24 | 2/92 | 0/4 | 0/15 | 0/5 | | 0/1 | 0/71 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 2-Nitrophenol | 0/47 | 0/28 | 0/104 | 0/4 | 0/30 | 0/9 | | 0/1 | 0/104 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 2,3,6-Trichlorophenol | 0/36 | 0/24 | 0/92 | 0/4 | 0/15 | 0/5 | | 0/1 | 0/71 | 0/0 | 0/5 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 4-Chloro-3-methylphenol | 0/47 | 0/28 | 0/104 | 0/4 | 0/30 | 0/9 | | 0/1 | 0/104 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 1/35 | 1/19 |
| 1,3,5-Trichlorobenzene | 0/47 | 0/28 | 0/104 | 0/4 | 0/15 | 0/9 | | 1/1 | 0/105 | 0/0 | 0/6 | 1/1 | 0/4 | 0/292 | 0/84 | 1/79 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/1 9 |
| Acenaphthylene | 2/47 | 2/28 | 1/104 | 0/4 | 0/30 | 0/9 | | 0/1 | 2/105 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| Dibenzo (a,h) anthracene | 0/47 | 0/28 | 0/104 | 0/4 | 0/15 | 0/9 | | 0/1 | 0/105 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/35 | 0/19 |
| 2,4,6-Trichloroaniline | 0/47 | 0/28 | 0/104 | 0/4 | 0/15 | 0/9 | | 0/1 | 0/105 | 0/0 | 0/6 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/34 | 0/19 |
| 1,2,4,5-Tetrachlorobenzene | 0/47 | 0/28 | 0/104 | 0/4 | 0/15 | 2/9 | | 1/1 | 0/105 | 0/0 | 1/6 | 1/1 | 0/3 | 0/0 | 0/0 | 0/0 | 0/0 | 0/31 | 0/0 | 0/0 | 0/34 | 0/19 |
| Acrylonitrile | 0/43 | 0/31 | 0/104 | 0/4 | 0/31 | 0/9 | | 0/1 | 0/213 | 0/0 | 0/6 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 |
| 1,1,2-Trichloroethane | 0/43 | 1/31 | 0/103 | 0/4 | 2/31 | 0/9 | | 0/1 | 0/213 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 0/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 |
| 1,2-Dichloroethane | 1/43 | 0/31 | 1/104 | 014 | 0/31 | 0/9 | | 0/1 | 0/213 | 0/0 | 0/15 | 0/1 | 0/4 | 0/0 | 0/0 | 0/0 | 7/13 | 0/12 | 0/0 | 0/0 | 0/0 | 0/0 |
| Totals | 4/576 | 7/364 | 4/1,327 | 0/52 | 2/303 | 2/109 | | 2/13 | 2/1,618 | 0/0 | 1/149 | 2/13 | 1/51 | 0/292 | 0/84 | 1/79 | 7/39 | 0/36 | 0/310 | 0/0 | 0/0 | 1/348 | 1/190 |
| Detection frequencies (o/o) | | | | | | | | | | | | | | | | | | | | | | | |
| (Control = 0°/0) | 0.7 | 1.9 | 0.3 | 0 | 0.7 | 1.8 | | 15.4 | 0.1 | 0 | 0.7 | 15.4 | 2.0 | 0 | 0 | 1.3 | 18.0 | 0 | 0 | — | — | 0.3 | 0.5 |

[a] Water
1) shallow well,
2) deep well,
3) sump,
4) surface,
5) drinking,
8) storm sewer,
7) sanitary sewer;

Soil:
8) soil,

Sediment:
9) sump,
10) storm sewer,
11) sanitary sewer,
12) surface water;

Air.
13) living area,
14) basement,
15) outdoor; and

Biota:
16) oatmeal,
17) potatoes,
18) crayfish,
19) dog,
20) maple,
21) mice,
22) worms.

SOURCE: US/EPA, op. cit., vol. III.

Love Canal treatment facility in volumes approaching 1 percent of the total sludge volume.[2]

A finding that 4 out of 16 chemicals known to have been disposed in the canal landfill calls into question the EPA conclusion that EDA is not contaminated by Love Canal chemicals except for sediments of storm sewers and surface water sediments at sewer discharge points. The discrepancy between the OTA and EPA finding can be explained. EPA aggregated data for **150** compounds including **129** priority pollutants, the majority of which were not known to have been disposed in the canal landfill. OTA focused on only those chemicals with a history of disposal.

The detection of four substances at higher frequencies in the EDA does not necessarily mean that these substances originated in the canal landfill. Frequencies of detection for 12 indicator substances were not significantly different and one had a greater frequency of detection in the control areas. It is to be expected that, at the 90-percent confidence level applied in these statistical analyses, **10** percent of the statistical tests showing significance might be in error. In this case, this means that **1.6** (or really **2)** of the **16 analyses might be a result** of chance. However, two or possibly four of the significant differences could be real indications of contamination in the EDA as compared to the control areas.

[2]**U. S. Environmental Protection** ***Agency, Analysis of the Love Canal Treatment Plant Sludge Sample,*** **memo from W. L. Budde, J. W. Eichelberger, P. Olynk to T. Hauser, Aug. 22, 1980.**

**Table D-5.—Summary of Mantel-Haenszel Results**

| Indicator substance | EDA V. control area | Love Canal v. control area |
|---|---|---|
| Lindane | No | No |
| Chlorobenzene | No | Yes |
| 1,2-Dichlorobenzene | Yes | Yes |
| 1,3-Dichlorobenzene | Yes | Yes |
| 1,4-Dichlorobenzene | (a) | (a) |
| 1,2,3-Trichlorobenzene | No | No |
| 1,2,4 -Trichlorobenzene | No | Yes |
| 1,3,5-Trichlorobenzene | — | No |
| 1,2,3,4-Tetrachlorobenzene | No | No |
| 1,2,3,5-Tetrachlorobenzene | — | — |
| 1,2,4,5-Tetrachlorobenzene | No | No |
| Pentachlorobenzene | No | — |
| Hexachlorobenzene | No | Yes |
| 2-Chloronaphthalene | No | — |
| 0-Chlorotoluene | — | — |
| 2-Chlorotoluene | Yes | Yes |
| 3-Chlorotoluene | No | No |
| 4-Chlorotoluene | Yes | Yes |
| 2,4-Dichlorotoluene | No | No |
| a,a2,6-Tetrachlorotoluene | — | — |

Yes: Significantly greater contamination in EDA (Love Canal).
No: No significant difference between areas.
—: Insufficient data.
(a): Control area shows significantly greater contamination.

SOURCE: Cupples, op. cit.

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