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CHEMICAL MANUFACTURERS ASSOCIATION

SEP 16 1989

September 13, 1989

TO: Vinylidene Chloride Panel Members

FROM: Barbara O. Francis *BOF*

RE: Illinois EPA Air Toxics Discussion Paper

Enclosed for your information is the Illinois Air Toxics Discussion Paper that is currently being reviewed by the Illinois Chemical Industry Panel. A list of the toxicologists on the reviewing committee is also enclosed.

The CIC committee is preparing comments to address the "scoring system", including the numerical scores for systemic effects and the ranking of organ effects. As soon as I receive the CIC draft proposal, I will forward it for your review.

Vinylidene Chloride is one of the chemicals being considered as part of "Option 1 and 2." Please review the attached paper and notify me as soon as possible whether the VDC panel should submit individual comments. The deadline for submission to the Illinois EPA is October 6, 1989.

As always, I can be reached at (202) 887-1314.

Attachments

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### Legend for Selection Basis Entries

For carcinogens, the entries include:

- classification of carcinogenicity (source)
- classifications are either known or probable human carcinogens
- sources include one or more of the following sources,

NTP - National Toxicology Program  
IARC - International Agency for Research on Cancer  
EPA - U.S. EPA Carcinogen Assessment Group  
ACGIH - American Conference of Governmental Industrial Hygienists

For non-carcinogenic air toxicants, the entries include:

- acute lethality value (lethality score)
- subacute value (subacute score)
- systemic (toxic) effect [severity of effects score] @ lowest toxic dose value [lowest toxic dose score] (integrated systemic toxicity score)

### Abbreviations

mg/kg = milligrams per kilogram  
mg/cu m = milligrams per cubic meter  
ppm = parts per million  
mg/kg-day = milligrams per kilogram per day  
Cat = category



BASIS FOR SELECTION OF  
AIR TOXICS CANDIDATES

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July 31, 1989

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| Option |   |   |   | Chemical                      | Selection Basis                                                                                                                                                                                                                                     |
|--------|---|---|---|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | 2 | 3 | 4 |                               |                                                                                                                                                                                                                                                     |
| X      | X | X |   | Boron trifluoride             | Air Toxicant, score = 11.00<br>Acute: 1180 mg/cu m (2)<br>Subacute: 3 mg/cu m (3)<br>Systemic: Pneumonitis [mild effect on Cat. I organ<br>= 6] @ 1.5 ppm [0.98 mg/kg-day = 4] (6.00)                                                               |
| X      | X | X | X | 1,3-Butadiene                 | Probable Human Carcinogen (NTP)                                                                                                                                                                                                                     |
| X      | X | X | X | n-Butyl alcohol               | Air Toxicant, score = 6.50<br>Acute: 790 mg/kg (1)<br>Subacute: 150 mg/cu m (1)<br>Systemic: Decreased hearing acuity [mild effect<br>on Cat. I organ = 6] @ 80 ppm [7.5 mg/kg-day<br>= 3] (4.50)                                                   |
| X      | X | X | X | Cadmium and compounds         | Probable Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                                                                          |
| X      | X | X | X | Caprolactam                   | Air Toxicant, score = 6.00<br>Acute: 300 mg/cu m (3)<br>Subacute: 1 mg-dust/cu m (3)<br>Systemic: none recognized (0.00)                                                                                                                            |
| X      | X | X | X | Carbon disulfide              | Air Toxicant, score = 10.00<br>Acute: 25000 mg/cu m (1)<br>Subacute: 30 mg/cu m (2)<br>Systemic: Significant vascular, nervous system,<br>and biochemical changes [definite effects<br>on Cat. I organs = 7] @ 9 ppm [0.87 mg/kg-day<br>= 4] (7.00) |
| X      | X | X |   | Carbon tetrachloride          | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                                                   |
| X      | X | X |   | Chlordane                     | Probable Human Carcinogen (EPA)                                                                                                                                                                                                                     |
| X      | X | X | X | Chlorinated<br>dibenzodioxins | Listed by International Joint Commission                                                                                                                                                                                                            |

## Basis for Selection of Air Toxics Candidates

| Option   |          |          |          | Chemical                 | Selection Basis                                                                                                                                                                                                                                              |
|----------|----------|----------|----------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                          |                                                                                                                                                                                                                                                              |
| X        |          |          |          | Acrylamide               | Probable Human Carcinogen (ACGIH)                                                                                                                                                                                                                            |
| X        | X        | X        | X        | Acrylic acid             | Air Toxicant, score = 7.00<br>Acute: 33.5 mg/kg (3)<br>Subacute: 30 mg/cu m (2)<br>Systemic: Lesions of nasal mucosa [mild effect on Cat. III organ = 2] @ 5 ppm [0.19 mg/kg-day = 4] (2.00)                                                                 |
| X        | X        | X        | X        | Acrylonitrile            | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                                                            |
| X        | X        | X        | X        | Alkylated lead compounds | Listed by International Joint Commission                                                                                                                                                                                                                     |
| X        | X        | X        | X        | Aniline                  | Air Toxicant, score = 9.25<br>Acute: 250 mg/kg (2)<br>Subacute: 10 mg/cu m (2)<br>Systemic: Methemoglobinemia [definite effect on Cat. I organ = 7] @ 5 ppm [6.3 mg/kg-day = 3] (5.25)                                                                       |
| X        | X        | X        | X        | Arsenic and compounds    | Known Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                                                                                      |
| X        | X        | X        | X        | Asbestos                 | Known Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                                                               |
| X        | X        | X        | X        | Benzene                  | Known Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                                                                                      |
| X        | X        | X        | X        | Benzo(a)pyrene           | Listed by International Joint Commission                                                                                                                                                                                                                     |
| X        | X        | X        | X        | Biphenyl                 | Air Toxicant, score = 10.75<br>Acute: 2400 mg/kg (1)<br>Subacute: 1.5 mg/cu m (3)<br>Systemic: Central and peripheral nerve damage, liver damage leading to acute yellow atrophy [severe effect on Cat. I organ = 9] @ 5 mg/cu m [1.08 mg/kg-day = 3] (6.75) |

| Option   |          |          |          | Chemical                   | Selection Basis                                                                                                                                                                               |
|----------|----------|----------|----------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                            |                                                                                                                                                                                               |
| X        | X        | X        | X        | DDT                        | Listed by International Joint Commission                                                                                                                                                      |
| X        |          |          |          | 4,4'-Diaminodiphenyl ether | Probable Human Carcinogen (NTP, IARC)                                                                                                                                                         |
| X        | X        |          |          | Dibutyl phthalate          | Air Toxicant, score = 8.00<br>Acute: 8000 mg/kg (0)<br>Subacute: 5 mg/cu m (2)<br>Systemic: Polyneuritis [mild effect on Cat. I organ = 6] @ 1.7 mg/cu m [0.11 mg/kg-day = 4] (6.00)          |
| X        | X        | X        | X        | p-Dichlorobenzene          | Probable Human Carcinogen (NTP, EPA)                                                                                                                                                          |
| X        | X        | X        | X        | Dieldrin                   | Listed by International Joint Commission                                                                                                                                                      |
| X        | X        | X        |          | Di(2-ethylhexyl) phthalate | Probable Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                    |
| X        |          |          |          | Dimethyl sulfate           | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                             |
| X        |          |          |          | Dimethylamine              | Air Toxicant, score = 6.50<br>Acute: 8371 mg/cu m (1)<br>Subacute: 18 mg/cu m (2)<br>Systemic: Liver damage [definite effect on Cat. I organ = 6] @ 97 ppm [12 mg/kg-day = 2] (3.00)          |
| X        | X        | X        |          | 1,4-Dioxane                | Probable Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                    |
| X        | X        | X        |          | Epichlorohydrin            | Probable Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                    |
| X        | X        |          |          | Ethyl acrylate             | Air Toxicant, score = 6.00<br>Acute: 8925 mg/cu m (1)<br>Subacute: 20 mg/cu m (2)<br>Systemic: Drowsiness and headache [mild effects of Cat. I organs = 6] @ 50 ppm [27 mg/kg-day = 2] (3.00) |

| Option   |          |          |          | Chemical                  | Selection Basis                                                                                                                                                                                                     |
|----------|----------|----------|----------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                           |                                                                                                                                                                                                                     |
| X        | X        | X        | X        | Chlorinated dibenzofurans | Listed by International Joint Commission                                                                                                                                                                            |
| X        | X        | X        |          | Chloroform                | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                   |
| X        | X        | X        | X        | Chromium and compounds    | Known Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                                             |
| X        | X        | X        | X        | Coal tar volatiles        | Known Human Carcinogen (ACGIH)                                                                                                                                                                                      |
| X        | X        |          |          | Cobalt and compounds      | Air Toxicant, score = 9.00<br>Acute: no data (0)<br>Subacute: 0.05 mg/cu m (3)<br>Systemic: Lung injury [mild effects on Cat. I organ = 6] @ 0.1 ppm [0.0036 mg/kg-day = 4] (6.00)                                  |
| X        |          |          |          | p-Cresidine               | Probable Human Carcinogen (NTP, IARC)                                                                                                                                                                               |
| deleted  |          |          |          | Cumene hydroperoxide      | Air Toxicant, score = 4.75<br>Acute: 1365 mg/cu m (2)<br>Subacute: no data (1)<br>Systemic: Pulmonary edema [definite effect on Cat. I organ = 7] @ 304 mg/kg [304 mg/kg-day = 1] (1.75)                            |
| X        |          |          |          | Cyclohexanone             | Air Toxicant, score = 6.25<br>Acute: 32111 mg/cu m (0)<br>Subacute: 100 mg/cu m (1)<br>Systemic: Degenerative liver and kidney changes [definite effects on Cat. I organs = 7] @ 190 ppm (4.4 mg/kg-day = 3) (5.25) |
| X        |          |          |          | 2,4-D                     | Air Toxicant, score = 7.75<br>Acute: 370 mg/kg (2)<br>Subacute: 10 mg/cu m (2)<br>Systemic: Kidney injury [minor effect on Cat. I organ = 5] @ 5 mg/kg-day [5 mg/kg-day = 3] (3.75)                                 |

| Option   |          |          |          | Chemical                                       | Selection Basis                                                                                                                                                                                                                           |
|----------|----------|----------|----------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                                                |                                                                                                                                                                                                                                           |
| X        | X        |          |          | Isobutyraldehyde                               | Air Toxicant, score = 6.50<br>Acute: 39500 mg/cu m (1)<br>Subacute: not listed (1)<br>Systemic: Hemoglominemia [mild effect on Cat. I organ = 6] @ 50 mg/kg [2.7 mg/kg-day = 3] (4.50)                                                    |
| X        | X        | X        | X        | Lead and compounds                             | Probable Human Carcinogen (NTP, EPA)                                                                                                                                                                                                      |
| X        | X        | X        | X        | Maleic anhydride                               | Air Toxicant, score = 6.50<br>Acute: 400 mg/kg (2)<br>Subacute: 1 mg/cu m (3)<br>Systemic: Increased susceptibility to lung infection and bronchitis [mild effect on Cat. I organ = 6] @ undefined concentration [? mg/kg-day = 1] (1.50) |
| X        | X        | X        | X        | Mercury                                        | Listed by International Joint Commission                                                                                                                                                                                                  |
| X        | X        |          |          | Methyl methacrylate                            | Air Toxicant, score = 6.50<br>Acute: 15350 mg/cu m (1)<br>Subacute: 410 mg/cu m (1)<br>Systemic: CNS effects (decreased neuronal firing rate) [mild effect on Cat. I organ = 6] @ 400 ppm [2.3 mg/kg-day = 3] (4.50)                      |
| X        | X        | X        |          | 4,4'-Methylenebis (N,N'-dimethyl) benzeneamine | Probable Human Carcinogen (NTP)                                                                                                                                                                                                           |
| X        | X        | X        | X        | Methylene chloride                             | Probable Human Carcinogen (NTP, EPA, ACGIH)                                                                                                                                                                                               |
| X        |          |          |          | 4,4'-Methylene dianiline                       | Probable Human Carcinogen (NTP)                                                                                                                                                                                                           |

| Option   |          |          |          | Chemical                  | Selection Basis                                                                                                                                                                                                                |
|----------|----------|----------|----------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                           |                                                                                                                                                                                                                                |
| X        | X        | X        | X        | Ethylene                  | Air Toxicant, score = 8.00<br>Acute: 1090270 mg/cu m (0)<br>Subacute: not listed (1)<br>Systemic: Cholinesterase inhibition [definite effect on Cat. I organ = 7] @ 3 mg/kg [0.24 mg/kg-day = 4] (7.00)                        |
| X        | X        | X        | X        | Ethylene dichloride       | Probable Human Carcinogen (NTP, IARC, EPA)                                                                                                                                                                                     |
| X        | X        | X        | X        | Ethylene oxide            | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                              |
| X        |          |          |          | Fluorine                  | Air Toxicant, score = 6.00<br>Acute: 144 mg/cu m (3)<br>Subacute: 2 mg/cu m (3)<br>Systemic: none recognized (0.00)                                                                                                            |
| X        | X        | X        | X        | Formaldehyde              | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                              |
| X        | X        | X        | X        | Hexachlorobenzene         | Listed by International Joint Commission                                                                                                                                                                                       |
| X        | X        | X        |          | Hexachlorocyclopentadiene | Air Toxicant, score = 13.00<br>Acute: 15 mg/cu m (3)<br>Subacute: 0.1 mg/cu m (3)<br>Systemic: Degenerative changes of liver and kidneys [definite effects on Cat. I organs = 7] @ 0.15 ppm [0.11 - 0.16 mg/kg-day = 4] (7.00) |
| X        | X        | X        |          | Hydrazine                 | Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                              |
| X        | X        | X        | X        | Hydrogen fluoride         | Air Toxicant, score = 11.00<br>Acute: 1040 mg/cu m (2)<br>Subacute: 2.5 mg/cu m (3)<br>Systemic: Lung injury [mild effects on Cat. I organ = 6] @ 17 ppm [0.53 mg/kg-day = 4] (6.00)                                           |

| Option   |          |          |          | Chemical               | Selection Basis                                                                                                                                                                                                           |
|----------|----------|----------|----------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                        |                                                                                                                                                                                                                           |
| X        | X        |          |          | 4-Nitrophenol          | Air Toxicant, score = 9.00<br>Acute: 250 mg/kg (2)<br>Subacute: not listed (1)<br>Systemic: CNS effects (disruption of reflexes) [mild effects of Cat. I organ = 6] @ 0.00125 mg/kg-day [0.001 mg/kg-day = 4] (6.00)      |
| X        | X        | X        | X        | 2-Nitropropane         | Probable Human Carcinogen (NTP, IARC)                                                                                                                                                                                     |
| X        |          |          |          | Peracetic acid         | Air Toxicant, score = 9.25<br>Acute: 450 mg/cu m (3)<br>Subacute: not listed (1)<br>Systemic: Chemical bronchopneumonia [definite effect on Cat. I organ = 7] @ 186 mg/cu m [3.2 mg/kg-day = 3] (5.25)                    |
| X        | X        | X        | X        | Phenol                 | Air Toxicant, score = 11.75<br>Acute: 316 mg/cu m (3)<br>Subacute: 19 mg/cu m (2)<br>Systemic: Severe damage to lung, heart, liver, and kidneys [severe effects on Cat. I organs = 9] @ 25 ppm [1.3 mg/kg-day = 3] (6.75) |
| X        | X        |          |          | Phosphorus             | Air Toxicant, score = 9.00<br>Acute: 3.03 mg/kg (3)<br>Subacute: 0.1 mg/cu m (3)<br>Systemic: Bone changes [definite effects on Cat. III organs = 3] @ 0.05 mg/kg [0.05 mg/kg-day = 4] (3.00)                             |
| X        | X        | X        | X        | PCBs                   | Listed by International Joint Commission                                                                                                                                                                                  |
| X        |          |          |          | Selenium and compounds | Air Toxicant, score = 8.00<br>Acute: 6700 mg/kg (0)<br>Subacute: 0.2 mg/cu m (3)<br>Systemic: CNS effects (socio-psychiatric disturbance) [minor effects of Cat. I organ = 5] @ 0.2 mg/cu m [0.02 mg/kg-day = 4] (5.00)   |

| Option   |          |          |          | <u>Chemical</u>                       | <u>Selection Basis</u>                                                                                                                                                                                                            |
|----------|----------|----------|----------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                                       |                                                                                                                                                                                                                                   |
| X        | X        | X        | X        | Methylenebis(phenyl-isocyanate) (MBI) | Air Toxicant, score = 6.00<br>Acute: 178 mg/cu m (3)<br>Subacute: not listed (1)<br>Systemic: Pulmonary fibrosis [major effect on Cat. I organ = 8] @ undefined concentration<br>[? mg/kg-day = 1] (2.00)                         |
| X        | X        | X        | X        | Mirex                                 | Listed by International Joint Commission                                                                                                                                                                                          |
| X        |          |          |          | Molybdenum trioxide                   | Air Toxicant, score = 7.75<br>Acute: 125 mg/kg (2)<br>Subacute: 5 mg/cu m (2)<br>Systemic: Pneumoconiosis [minor effect on Cat. I organ = 5] @ 10 mg/m <sup>3</sup> [1.3 mg/kg-day = 3] (3.75)                                    |
| X        | X        | X        | X        | Nickel and compounds                  | Known Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                                                    |
| X        | X        | X        | X        | Nitric acid                           | Air Toxicant, score = 6.50<br>Acute: 170 mg/cu m (3)<br>Subacute: 5 mg/cu m (2)<br>Systemic: Increased susceptibility to pulmonary infection [mild effect on Cat. I organ = 6] @ undefined concentration [? mg/kg-day = 1] (1.50) |
| X        | X        | X        | X        | 2-Nitrophenol                         | Air Toxicant, score = 9.00<br>Acute: 334 mg/kg (2)<br>Subacute: not listed (1)<br>Systemic: CNS effects (disruption of reflexes) [mild effect of Cat. I organ = 6] @ 0.003 mg/kg-day [0.003 mg/kg-day = 4] (6.00)                 |

| Option   |          |          |          | <u>Chemical</u>       | <u>Selection Basis</u>                                                                                                                                                                                |
|----------|----------|----------|----------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                       |                                                                                                                                                                                                       |
| X        | X        |          |          | 2,4,6-Trinitrotoluene | Air Toxicant, score = 10.00<br>Acute: 795 mg/kg (1)<br>Subacute: 0.5 mg/kg (3)<br>Systemic: Liver damage [mild effects on Cat. I organ<br>= 6] @ 2.38 mg/cu m [0.15 mg/kg-day = 4]<br>(6.00)          |
| X        | X        | X        | X        | Vinyl chloride        | Known Human Carcinogen (NTP, IARC, EPA, ACGIH)                                                                                                                                                        |
| X        | X        |          |          | Vinylidene chloride   | Air Toxicant, score = 7.50<br>Acute: 25175 mg/cu m (1)<br>Subacute: 20 mg/cu m (2)<br>Systemic: Liver and kidney damage [mild effects<br>on Cat. I organs = 6] @ 25 ppm [5.8<br>mg/kg-day = 3] (4.50) |

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| Option   |          |          |          | Chemical                       | Selection Basis                                                                                                                                                                                                                                 |
|----------|----------|----------|----------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> |                                |                                                                                                                                                                                                                                                 |
| X        |          |          |          | Sodium fluoride                | Air Toxicant, score = 8.00<br>Acute: 52 mg/kg (2)<br>Subacute: 2.5 (for F) mg/cu m (3)<br>Systemic: Bone injury (osteosclerosis) [definit effect on Cat. III organ = 3] @ 4 mg/cu m [0.26 mg/kg-day = 4] (3.00)                                 |
| X        | X        | X        | X        | Sulfuric acid                  | Air Toxicant, score = 11.00<br>Acute: 510 mg/cu m (2)<br>Subacute: 1 mg/cu m (3)<br>Systemic: Slight pulmonary histopathology [mild effect on Cat. I organ = 6] @ 0.38 mg/cu m [0.061 mg/kg-day = 4] (6.00)                                     |
| X        | X        | X        | X        | Tetrachloroethylene            | Probable Human Carcinogen (NTP, EPA)                                                                                                                                                                                                            |
| X        | X        | X        | X        | Toluene 2,4-diisocyanate (TDI) | Air Toxicant, score = 12.00<br>Acute: 95 mg/cu m (3)<br>Subacute: 0.04 mg/cu m (3)<br>Systemic: Sensitizer leading to respiratory difficulty [mild effect on Cat. I organ = 6] @ 0.01 ppm [0.0022 mg/kg-day = 4] (6.00)                         |
| X        | X        | X        | X        | Toxaphene                      | Listed by International Joint Commission                                                                                                                                                                                                        |
| X        | X        | X        | X        | Trichloroethylene              | Probable Human Carcinogen (EPA)                                                                                                                                                                                                                 |
| X        | X        | X        | X        | 1,2,4-Trimethylbenzene         | Air Toxicant, score = 6.50<br>Acute: 18000 mg/cu m (1)<br>Subacute: 125 mg/cu m (1)<br>Systemic: CNS (nervous anxiety) and respiratory difficulty [mild effect on Cat. I organ = 6] @ 10 - 60 ppm total hydrocarbons [1.5 mg/kg-day = 3] (4.50) |

| <u>Chemical</u>                | <u>Reference</u>                                                                                                                                                                                                                                 |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethyl acrylate                 | Nemec, J. W., W. Bauer, Jr.; <u>Kirk-Othmer Encycl Chem Tech</u> , 3rd ed. Vol 1 pages 330-354, John Wiley and Sons, N.Y. (1978)                                                                                                                 |
| Ethylene                       | Krasovitskaya, M. L., L. Malyarova; <u>Gig Sanit</u> 33(5), 7 (1968)                                                                                                                                                                             |
| Hexachlorocyclopentadiene      | Treon, J. F.; <u>Arch Env Hlth</u> 11:459 (1955)                                                                                                                                                                                                 |
| Hydrogen fluoride              | Largent, E. J.; <u>Fluorosis</u> , Ohio State University Press, Columbus, OH (1961)                                                                                                                                                              |
| Isobutyraldehyde               | Svintukhovskii, O. A.; "Toxicological Characteristics of iso Butyraldehyde", <u>Toksikol Gig Prod Neftekhim Neftekhim Prodzvod</u> 187 (1972)                                                                                                    |
| Maleic anhydride               | Tanaka, S.; <u>J Sci Labor</u> page 117, Japan (February 1976)                                                                                                                                                                                   |
| Methyl methacrylate            | Innes, D. L.; <u>Neurotoxicol</u> 2(3):515-522 (1981)                                                                                                                                                                                            |
| Methylenebis(phenylisocyanate) | <u>Ann Occup Hyg</u> , 21(2):121 (1978)                                                                                                                                                                                                          |
| Molybdenum trioxide            | Mogilevskaya, O. Ya. (1963) In: <u>Toxicology of Rare Metals</u> , pages 12-27. Izrael'son, Z. I. (Ed.) Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow (Translated by Israely Program for Scientific Translation, Jerusalem, 1967) |
| Nitric acid                    | Fairhall, L. T.; <u>Industrial Toxicology</u> 2nd ed., Williams and Wilkins, Baltimore, MD (1957)<br><br>Treiger, P.; "Nitric Acid Fume Pneumonia", <u>Ind Med</u> 16:395 (1947)                                                                 |
| 2-Nitrophenol                  | Makhinya (1969) abstract only                                                                                                                                                                                                                    |
| 4-Nitrophenol                  | Ibid                                                                                                                                                                                                                                             |
| Peracetic acid                 | Heinze, W.; "Peracetic Acid Aerosol Effect in Long-term Use of Germicidal Concentrations on Experimental Animals", <u>Wiss, Z. Humbolt - Univ. Berlin, Math - Natur ss Reihe</u> 33(5):513-517 (1984)                                            |

## References

| <u>Chemical</u>   | <u>Reference</u>                                                                                                                                                                                                  |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acrylic acid      | Miller, R. R.; Fund Appl Toxicol 1:271-277 (1981)                                                                                                                                                                 |
| Aniline           | Oberst, F. W.; Arch Ind Health 13:379 (1956)                                                                                                                                                                      |
| Biphenyl          | Hakkinen, I., S. Hernberg, P. Karli, and E. Vikkula; "Diphenyl Poisoning in Fruit Paper Production", Arch Environ Health 26:70-74 (1973)                                                                          |
| Boron trifluoride | Torkelson, T. R., S. E. Sadek, V. K. Rowe; "The Toxicity of Boron Trifluoride when Inhaled by Laboratory Animals", Am Ind Hyg Assoc J 22:263-270 (1961)                                                           |
| n-Butanol         | Seitz, B.; Soc Med Hyg du Travail (April 10, 1972)<br><br>Velasquez, J.; Med del Trabajo 1:43 (1964)                                                                                                              |
| Carbon disulfide  | Mihail, J.; Arch Mal Prof 29:109 (1968)                                                                                                                                                                           |
| Cobalt            | Kerfoot, E. J., W. G. Fredrick, and E. Domeier; "Cobalt Metal Inhalation Studies on Miniature Swine", Am Ind Hyg Assoc J 36:17-25 (1975)                                                                          |
| Cyclohexanone     | Treon, J. F.; J Ind Hyg Tox 25:323 (1943)                                                                                                                                                                         |
| 2,4-D             | Hazleton Laboratories, 1983 Document Accession Number 251473, U.S. EPA, Office of Pesticide Programs, Washington, D.C.                                                                                            |
| Dibutyl phthalate | Milkov, L. E., <u>et al</u> , "Health Status of Workers Exposed to Phthalate Plasticizers in the Manufacture of Artificial Leather and Films Based on PVC Resins", Env Health Persp pages 175-178 (January, 1973) |
| Dimethylamine     | Dow Chemical Co., unpublished report (1964)                                                                                                                                                                       |

**Systemic Toxicity Score - Severity of Effects Scoring  
Distribution of Toxicity Endpoints**

| Score: | 1                                                                     | 2                                                                                                                                  | 3                                                                                                                                                                                               | 4                                                                  | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8                                                                                                                                                                                                                                                                                                                                                     | 9                                                                                                                                   |
|--------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|        | <ul style="list-style-type: none"> <li>subjective symptoms</li> </ul> | <ul style="list-style-type: none"> <li>lesions of nasal mucosa</li> <li>flu symptoms</li> <li>dilation of blood vessels</li> </ul> | <ul style="list-style-type: none"> <li>bladder stones</li> <li>skin abnormalities</li> <li>osteoporosis</li> <li>reduced growth</li> <li>osteosclerosis</li> <li>minor blood changes</li> </ul> | <ul style="list-style-type: none"> <li>blood alteration</li> </ul> | <ul style="list-style-type: none"> <li>decreased RBC</li> <li>headache/nausea/dizziness</li> <li>fatty degeneration of liver</li> <li>loss of concentration</li> <li>Cat. I organ injury</li> <li>hepatic porphoria</li> <li>pneumoconiosis</li> <li>Cat. I organ dysfunction</li> <li>increased Cat. I organ weight</li> <li>decreased uptake of norepinephrine</li> <li>dyspnea</li> <li>exaggerated lung markings</li> <li>Cat. I organ congestion</li> <li>ulcers</li> </ul> | <ul style="list-style-type: none"> <li>narcotic effect</li> <li>histology of "</li> <li>to pulmonary infection</li> <li>depression</li> <li>hearing loss</li> <li>asthmatic bronchitis</li> <li>histology of lung</li> <li>hepatomegally</li> <li>anemia</li> <li>disruption of reflexes</li> <li>heavy sub-</li> <li>decreased pulmonary compliance</li> <li>Cat. I organ degeneration</li> <li>polyneuritis</li> <li>pneumonitis</li> <li>EKG changes</li> <li>jaundice</li> <li>nephritis</li> </ul> | <ul style="list-style-type: none"> <li>decreased cholinesterase</li> <li>hepatocellular vacuolization</li> <li>significant biochemical changes</li> <li>pulmonary edema</li> <li>histology of brain</li> <li>decreased birth weight with maternal effects</li> <li>asthmatic sensitization</li> <li>methemoglobinemia</li> <li>kidney tubular damage</li> <li>bronchopneumonia</li> <li>hepatitis</li> <li>fetal organ weight change</li> <li>focal emphysema</li> <li>polyneuropathy</li> <li>chromosome aberration</li> <li>decreased sperm production</li> </ul> | <ul style="list-style-type: none"> <li>bone marrow suppression</li> <li>Cat. I organ necrosis</li> <li>pulmonary fibrosis</li> <li>CNS deterioration</li> <li>reversible teratogenesis</li> <li>reproductive effects</li> <li>neuro-psychiatric effects</li> <li>fetal toxicity</li> <li>convulsions</li> <li>sterility</li> <li>emphysema</li> </ul> | <ul style="list-style-type: none"> <li>damage to multiple organs</li> <li>hepatic atrophy</li> <li>respiratory paralysis</li> </ul> |

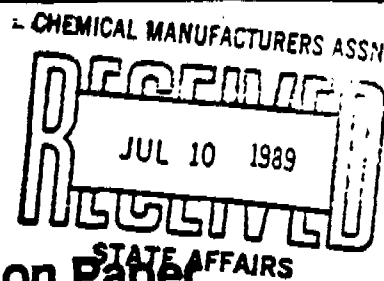
Note: Reversible effects can lower score. Multiple organ effects can raise score.

| <u>Chemical</u>          | <u>Reference</u>                                                                                                                                                                     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phenol                   | Deichmann, W. B.; Am J Clin Path 14:273 (1944)                                                                                                                                       |
| Phosphorus               | Fleming, R. B. L.; J Ind Hyg Tox 24:154 (1942)                                                                                                                                       |
| Selenium                 | Glover, J. R., B. Chir; "Selenium and its Industrial Toxicology", Ind Med 39:50 (1970)                                                                                               |
| Sodium fluoride          | Williams, C. R.; J Ind Hyg Tox 24:277 (1942)                                                                                                                                         |
| Sulfuric acid            | Alarie, Y., W. M. Busey, A. A. Krumm, C. E. Ulrich; "Long-term Continuous Exposure to Sulfuric Acid Mist in Cynomolgus Monkeys and Guinea Pigs", Arch Environ Health 27:16-24 (1973) |
| Toluene 2,4-diisocyanate | Elkins, H. B., G. W. McCarl, H. G. Brugsch, J. P. Fahy; "Massachusetts Experience with Toluene Di-isocyanate", Am Ind Hyg Assoc J 23:265-272 (1962)                                  |
| 1,2,4-Trimethylbenzene   | Battig, K.; Z Prav Med 1:389 (1957)                                                                                                                                                  |
| 2,4,6-Trinitrotoluene    | Goodwin, J. W.; "Twenty Years Handling TNT in a Shell Loading Plant", Am Ind Hyg Assoc J 33:41-44 (1972)                                                                             |
| Vinylidene chloride      | <u>Patty's Industrial Hygiene and Toxicology</u><br>3rd ed. Vol. 2B pages 3545-3550, Wiley and Sons N.Y., N.Y. (1981)                                                                |
| LDM/A/020/psf            |                                                                                                                                                                                      |

5. Highly toxic substances. Lists ranging in number from 12 to 30 are presented with de minimis values ranging from 1 ton per year to 10 tons per year. A score of 6 - 10 is considered highly toxic.

The most controversial provision presented in the document is the toxicity ranking system. Efforts are under way to obtain further information as to how these scores were developed. IEPA has proposed an on site visit for those parties interested in reviewing documentation relating to this process. CIC is planning to review the documents late next week.

July 5, 1989



## **IEPA Air Toxics Discussion Paper**

Attached is a copy of IEPA's Air Toxics Discussion Paper prepared by the Agency to facilitate discussion about the adoption of an air toxics list for Illinois. The paper proposes four list options ranging from 46 to 79 chemicals. This action is mandated by Section 9.5 of the Environmental Protection Act which specifies that the Agency propose such a list to the Pollution Control Board.

A distribution is being made to all CIC member companies in preparation for an Agency Regulatory Development Session that will be held July 31, 1989. **Companies with comments on the document and those desiring to participate in the CIC Air Toxics Subcommittee should contact Dan Grissom (312) 856-7570 by July 17.** A CIC Air Toxics Subcommittee meeting will be held July 21 at the Amoco building in Chicago to discuss all comments and begin development of a written statement to be submitted to the Agency prior to the Regulatory Development Session. The following outlines the development of the list options.

The IEPA is proposing four possible options for lists of air toxics that will be subject to control requirements at a future date. The four lists each contain the following components, with or without provisions for de minimis levels:

1. A Governors list of air toxics agreed to by the Governors of the Great Lake states. There are 11 chemicals on this list. No de minimis levels are allowed.
2. Known human carcinogens. Seven chemicals are listed with no de minimis provisions.
3. Probable human carcinogens. Lists ranging in number from 9 to 20 are presented with de minimis values ranging from 1 ton per year to 10 tons per year.
4. Extremely toxic substances. Eleven chemicals are listed with no de minimis provision. Toxic is defined using a numbering system that adds Agency assigned values for acute, subacute and systemic toxicity. A score of 11 to 15 is considered extremely toxic.

(over)



Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

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**AIR TOXICS**  
**DISCUSSION PAPER**

**PREPARED BY**  
**ILLINOIS EPA**

**MAY, 1989**

SL 064790

- d. The Board, pursuant to Title VII, shall adopt regulations establishing a program to control toxic contaminants released into the air in a manner that protects the public health and the environment. The Agency shall propose regulations to the Board for adoption which meet the requirements of this subsection.
- e. The requirements of this Section shall not apply to the following:
  - 1. retail dry cleaning operations;
  - 2. retail and noncommercial storage and handling of motor fuels;
  - 3. combustion processes using only commercial fuel, including internal combustion engines;
  - 4. incidental or minor sources including laboratory-scale operations, and such other sources or categories of sources which are determined by the Board to be of minor significance.

The Illinois Environmental Protection Agency ("IEPA") is proceeding to compile a list of toxic air contaminants for promulgation by the Illinois Pollution Control Board. The promulgation of the list fulfills the first obligation of IEPA as stated in subsection (c) of Section 9.5. IEPA desires to fulfill this obligation with the cooperation of industry and environmental groups as well as interested citizens in the State of Illinois. To that end, IEPA seeks comments on ideas presented in this discussion paper.

The purpose of this discussion paper is to present to the reader a step-by-step approach of how IEPA developed and now proposes to apply a two-part criterion (an emissions criterion and a human health criterion) to arrive at the chemicals on its proposed list. Several options are presented in an effort to clarify concerns and suggestions regarding the chemicals to be

## AIR TOXICS DISCUSSION PAPER

### INTRODUCTION

Section 9.5 of the Illinois Environmental Protection Act (Ill. Rev. Stat. ch. 111 1/2 §§1001-1052 (January 1, 1989)) ("Act") ("Section 9.5") was passed by the General Assembly on June 29, 1987, and was signed by the Governor on September 23, 1987. Section 9.5 establishes a state program to identify and to adopt regulations for the control of toxic air contaminants found in Illinois. The section is printed below, in its entirety.

#### Section 9.5

a. The General Assembly finds that:

1. The public health and welfare may be endangered by the release of toxic contaminants into the air which are carcinogenic, teratogenic, mutagenic or otherwise injurious to humans or the environment.
2. Existing federal programs may not be adequate to protect the public and the environment from low-level chronic exposure to toxic air contaminants.

b. It is the purpose of this Section to establish a State program to identify and adopt regulations for toxic air contaminants in Illinois.

c. The Board, pursuant to Title VII, shall promulgate a list of toxic air contaminants. The list published under this subsection shall include any air contaminant which may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or may pose a significant threat to human health or the environment. The Agency shall propose to the Board for adoption a list which meets the requirement of this subsection.

The provisions of subsection (b) of Section 27 of this Act shall not apply to rulemakings under this subsection (c).

Section 313 required reporting ("A 313 Inventory"), 2) the Illinois Air Division Inventory ("Illinois Inventory"), 3) the Great Lakes Toxic Substances Control Agreement, dated May 21, 1986, International Joint Committee Chemicals List ("IJC List"), and 4) the Air Toxics Emission Inventory for the Southeast Chicago Area, dated July 1, 1987, by the United States Environmental Protection Agency ("USEPA"), Air and Radiation Branch of Region V ("S.E. Chicago Inventory"). These four sources were chosen because they provided the most accurate estimate of routine air emissions available to IEPA. A discussion of each is presented in the following sections.

#### SARA 313 Inventory

In 1986 the President signed into law the Superfund Amendments and Reauthorization Act of 1986 ("SARA"). Title III of SARA is an independent statute entitled "The Emergency Planning and Community Right-to-Know Act of 1986." Title III establishes programs to provide the public with important information on the types and amounts of hazardous chemicals emitted by facilities in their communities, as well as providing emergency planning and notification requirements which help protect the public in the event of a sudden release of a hazardous substance.

Section 313 of Title III requires annual reports to be filed by certain companies which release into the environment any of 324 compounds listed as toxic chemicals in Section 313. This reporting requirement covers routine emissions which occur as a result of normal business operations within a calendar year, and non-routine or accidental chemical releases. The emissions data reported are not necessarily derived from actual monitoring or measurements, but may be estimated from published emission factors, material balance or best engineering calculations.

included on the proposed list. It is anticipated that this presentation will facilitate meaningful discussion of the issues involved in this phase of the development of Illinois' air toxics program.

#### ILLINOIS' TWO-PART CRITERION

##### I. EMISSIONS CRITERION

The General Assembly stated in subsection (b) of Section 9.5:

- b. It is the purpose of this Section to establish a State program to identify and adopt regulations for toxic air contaminants in Illinois.

The General Assembly's use of the words "State program" and "in Illinois" in this subsection suggests that a toxic air contaminant should be emitted in Illinois to be included on the list. Also, the General Assembly states two findings in subsection (a) of Section 9.5 regarding the danger to public health and welfare posed by the release of toxic air contaminants and the lack of protection by federal programs. Since the General Assembly's responsibility is to the citizens of Illinois, it is assumed that their intent was to protect these citizens from chemicals emitted in Illinois. Therefore, the first criterion is that the toxic air contaminant be emitted in Illinois. (The one exception to this emissions criterion is the IJC List, discussed below, which was the subject of prior agreements of Governor Thompson.)

The next step is to determine what chemicals are emitted in Illinois and in what quantities. IEPA looked to four sources to make these determinations: 1) Title III (the Emergency Planning and Community Right-to-Know Act) of the Superfund Amendments and Reauthorization Act of 1986

### Illinois Inventory

The Division of Air Pollution Control maintains an inventory of toxic air contaminants emitted by facilities in Illinois. Data for this inventory are obtained from construction and operating permit applications. Permit applications evaluated for toxic emissions are predominantly from those facilities with Standard Industrial Classification (SIC) codes of 28 through 30.

Although the Illinois Inventory is not as extensive as the SARA 313 Inventory, it does contain additional toxic chemical emissions information not listed in the SARA 313 Inventory. Of the 210 chemicals in the Illinois Inventory which are not in the SARA 313 Inventory, eight are not subject to trade secret claims and have a toxicity potential score of greater than 6. (See the Human Health Criterion Section below for further explanation of toxicity potentials.)

### IJC List

On May 21, 1986, the Governors of Illinois, Michigan, Indiana, New York, Ohio, Wisconsin, Minnesota and Pennsylvania signed the "Great Lakes Toxic Substances Control Agreement". This agreement established a framework for coordinating the study and control of toxic pollutants impacting the Great Lakes Basin. On September 8, 1986, Environmental Directors from all eight Great Lake States, including Illinois, signed a subsequent agreement titled: "Toxic Substances Management In The Great Lakes Basin Through The Permitting Process". This document required each of the eight state environmental agencies to develop and implement strategies for minimizing emissions of eleven specific air pollutants. These pollutants were previously identified

Facilities subject to reporting under Section 313 are those that have 10 or more full-time employees; that are in primary Standard Industrial Classification (SIC) codes 20 through 39; and that manufactured, processed or otherwise used a listed toxic substance in excess of specified threshold quantities. (Please see Appendix A for a list of industrial categories that are included within SIC codes 20-39.) These SIC codes exclude utility companies, publicly-owned sewage treatment works, and waste treatment, storage, and disposal facilities from the reporting requirements under Section 313.

The requirements for reporting are different for users of chemicals, in contrast to manufacturers or processors of chemicals. For the 1987 reporting year, facilities using listed toxic chemicals in quantities of over 10,000 pounds and facilities manufacturing or processing these chemicals in excess of 75,000 pounds were required to submit emissions data to both IEPA and USEPA by July 1, 1988. For subsequent years, the reporting thresholds decrease. Consequently, the number of reporting facilities should increase. (Please see the Future Changes to the Proposed List Section below for a discussion of additional SARA 313 reporting.)

Referring to the SARA 313 information for 1987 received by IEPA as of December 1, 1988, 137 different chemicals were emitted into the air in the State of Illinois. This information is summarized in the "First Annual Toxic Chemical Report" published by IEPA in February, 1989. Title VI-B, Section 25b-4 of the Act mandates the IEPA to prepare this annual report and requires facilities to submit the data for releases of toxic chemicals.

### Summary

The total number of chemicals in the SARA 313 Inventory, the Illinois Inventory, the IJC List and S.E. Chicago Inventory is 361. No chemical was counted more than once even if it appeared on more than one list. Please refer to Appendix B for a list of all the chemicals, their Chemical Abstracts Service ("CAS") numbers and the sources in which the chemicals can be found. Appendix B contains the 210 chemicals found on the Illinois Inventory, including the chemicals that are subject to trade secret claims.

## II. HUMAN HEALTH CRITERION

The second part of IEPA's two-part criterion for determining whether a chemical should be on the proposed list involves an examination of the toxic properties of the chemicals and their potential threat to human health. The following two subsections of Section 9.5 indicate the intent of the General Assembly regarding what chemicals should be listed.

- a. The General Assembly finds that:
  - 1. The public health and welfare may be endangered by the release of toxic contaminants into the air which are carcinogenic, teratogenic, mutagenic or otherwise injurious to humans or the environment.
- c. ....The list published under this subsection shall include any air contaminant which may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or may pose a significant threat to human health or the environment....

Several terms used in subsection (a)(1) of Section 9.5 need to be defined in order to understand the issues presented in assessing the effects on human health of a chemical release. A carcinogen is a substance which can under

by the International Joint Commission ("IJC") as adversely impacting the Great Lakes biosphere. Studies by the IJC and others demonstrated that large quantities of these pollutants enter the Great Lakes through the atmospheric deposition route. In March, 1989, the same eight Environmental Directors signed another document, the "Great Lakes State Air Permitting Agreement", which supported the original concept of controlling air emissions of IJC specified pollutants.

#### S.E. Chicago Inventory

The USEPA, Region V, Air and Radiation Branch has studied the extent of toxic air contamination in the Southeast Chicago area. The reports generated by Region V from their investigations include: "Air Toxics Emission Inventory for the Southeast Chicago Area", dated July, 1987; "Updates to an Air Toxics Emission Inventory for the Southeast Chicago Area", dated January, 1989; and, "Estimation and Evaluation of Cancer Risks Attributed to Air Pollution in Southeast Chicago", draft dated January, 1989. These documents list the facilities studied, the types and quantities of chemicals emitted from each facility, and the probable human health effects resulting from exposure to the chemicals. Sixty-seven toxic air pollutants are identified by USEPA as being emitted from facilities in Southeast Chicago. Of those 67 chemicals, IEPA considered for inclusion on the list only the 31 chemicals that a facility itself reported emitting. Two chemical categories, coke oven emissions and polycyclic organic matter, were identified from the S.E. Chicago Inventory, meeting the above condition. In both cases, other specific chemicals within the identified categories were already contained in the SARA 313 Inventory.

there is little or no cancer data for humans; however, limited evidence exists that cancers can be produced in laboratory animals. The following four well recognized sources were used in determining how to identify and classify carcinogens: the National Toxicology Program's (NTP) Fourth Annual Report on Carcinogens; the International Agency for Research on Cancer (IARC) Monographs Supplement 4 and Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans - Volumes 30-42; the USEPA Carcinogen Assessment Group (CAG) list; and the American Conference of Governmental Industrial Hygienists (ACGIH) 1988-89 Exposure Manual, Appendix A.

#### Toxicity Potential

A toxicity potential score was determined for each compound based on data regarding its acute lethality, subacute toxicity and systemic toxicity. The toxicity potential score was determined as follows:

$$\text{Toxicity Potential Score} = \text{Acute Lethality Score} + \text{Subacute Toxicity Score} + \text{Systemic Toxicity Score}$$

The scores from this equation range from 1 (lowest toxicity) to 15 (highest toxicity). The relative weight given to acute lethality is one-fifth, subacute toxicity is one-fifth and systemic toxicity is three-fifths. Point values were assigned for each sub-score as described below.

#### Acute Lethality

Acute lethality is a measure of the ability of a single exposure of a substance to cause death. This is commonly quantified in terms of the amount

certain circumstances produce cancerous growth. A teratogen is a substance which can cause birth defects. A mutagen is a substance which can increase the frequency of alterations in the genetic material of cells.

Several terms used in subsection (c) of Section 9.5 also warrant explanation. An increase in mortality is a greater frequency of deaths. An increase in serious irreversible illness means a greater frequency of diseases that limit activity and do not significantly improve following medical treatment. In contrast, an increase in incapacitating reversible illness is a greater frequency of diseases which are debilitating but improve with medical treatment.

IEPA developed human health criteria using both a cancer potential and a toxicity potential. IEPA sought the services of ICAIR, Life Systems, Inc. ("ICAIR"), a privately owned health and environmental effects consulting firm located in Cleveland, Ohio, in identifying the toxicity data for each chemical candidate for the Illinois proposed list. These human health criteria are further described as follows.

#### Cancer Potential

The cancer potential ranking can be divided into three categories: known human carcinogens, probable human carcinogens, and possible human carcinogens. A known human carcinogen is a substance for which there exists sufficient evidence that exposure can result in cancerous growths in humans. A probable human carcinogen is a substance for which only limited evidence exists that cancerous growths in humans result from exposure; however, sufficient evidence exists that cancerous growths can be produced in laboratory animals. A possible human carcinogen is a substance for which

### Subacute Toxicity Scoring

|                                          |     |
|------------------------------------------|-----|
| TLV < 5 mg/m <sup>3</sup>                | = 3 |
| TLV 5 - 50 mg/m <sup>3</sup>             | = 2 |
| TLV > 50 mg/m <sup>3</sup> or not listed | = 1 |

### Systemic Toxicity

Systemic toxicity is a measure of the ability of a substance to cause adverse health effects usually after absorption and distribution of the substance throughout the body. It often affects organs distant from the site of the exposure. Systemic toxicity data were compiled by ICAIR which reviewed the relevant literature and resources to define adverse effects to humans (or animals, if no human data could be located) and the amount of the substance required to cause the effect.

Systemic toxicity scores were assigned by IEPA based on this data. The systemic toxicity score was determined by the product of two subscores; one for the lowest toxic dose and one for the severity of the effects. A correction factor of 0.25 was used to ensure that the systemic toxicity score would not exceed nine points in total. In sum, the systemic toxicity score is determined as follows:

$$\text{Systemic Toxicity Score} = 0.25 \times \begin{matrix} \text{Lowest Toxic Dose Score} \times \\ \text{Severity of Effects Score} \end{matrix}$$

The lowest toxic dose is the lowest dose of a substance that causes an observable effect. The scoring for the lowest toxic dose is as follows:

of a substance that kills 50% of the tested population of laboratory animals. Acute lethality data were comprised of experimentally derived concentrations of the substance in the air that was estimated to kill half of a group of laboratory rats following a brief exposure (8 hours or less) ( $LC_{50}$ ). If no inhalation data were available, the fatal amount if ingested was used ( $LD_{50}$ ). Acute lethality data are sometimes developed for several species of laboratory animals. The rat (the most commonly used laboratory animal) was selected for consistency within this evaluation. The primary source for these data was the Registry of Toxic Effects of Chemical Substances (RTECS) data base. The acute lethality scoring system is presented below.

#### Acute Lethality Scoring\*

|                                         |                                               |     |
|-----------------------------------------|-----------------------------------------------|-----|
| $LC_{50} < 500 \text{ mg/m}^3$          | <u>or</u> $LD_{50} < 50 \text{ mg/kg}$        | = 3 |
| $LC_{50} 500 - 4,999 \text{ mg/m}^3$    | <u>or</u> $LD_{50} 50 - 499 \text{ mg/kg}$    | = 2 |
| $LC_{50} 5,000 - 50,000 \text{ mg/m}^3$ | <u>or</u> $LD_{50} 500 - 5,000 \text{ mg/kg}$ | = 1 |
| $LC_{50} > 50,000 \text{ mg/m}^3$       | <u>or</u> $LD_{50} > 5,000 \text{ mg/kg}$     | = 0 |

#### Subacute Toxicity

Subacute toxicity is a measure of the ability of a substance to cause an adverse health effect (not usually death) occurring over a limited period of time after repeated exposures to the chemical. Subacute toxicity data were comprised of worker exposure limit values (threshold limit values) formulated by the American Conference of Governmental Industrial Hygienists. The subacute toxicity scoring system is presented below:

\*Please note the following abbreviations:  
 $\text{mg/m}^3$  means milligram per cubic meter, and  
 $\text{mg/kg}$  means milligram per kilogram of body weight.

(Please see Appendix C for the identification of category I, II and III organs for the systemic toxicity scoring.) Both the severity of effects and the ranking of organs was generally patterned after information contained in the USEPA published document entitled Unfinished Business: A Comparative Assessment of Environmental Problems, Appendix II, Non-Cancer Risk Work Group, dated February, 1987.

OPTIONS FOR THE  
PROPOSED ILLINOIS AIR  
TOXICS LIST

To review, the two-part criterion for the proposed list includes an emissions criterion and a human health criterion. Regarding the emissions criterion, IEPA presents optional de minimis levels of emissions below which a chemical will not be included on the proposed list. Section 9.5 supports the use of a reasonable de minimis level in subsection (e)(4).

- e. The requirements of this Section shall not apply to the following:
  - 4. incidental or minor sources including laboratory-scale operations, and such other sources or categories of sources which are determined by the Board to be of minor significance.

Regarding the human health criterion, the options presented below include five categories of chemicals: 1) the eleven air pollutants from the IJC List; 2) known human carcinogens identified by the sources listed in the Cancer Potential Section; 3) chemicals with a toxicity potential score of greater than 10 but not exceeding 15 (noted as "extremely toxic chemicals");

Lowest Toxic Dose Scoring\*

|                   |     |
|-------------------|-----|
| < 1.0 mg/kg-d     | = 4 |
| 1.0 - 9.9 mg/kg-d | = 3 |
| 10 - 50 mg/kg-d   | = 2 |
| > 50 mg/kg-d      | = 1 |

The severity of effects includes the type of effect as well as the organs affected. The scoring for the severity of effects is as follows:

Severity of Effects Scoring

|                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Severe, life threatening effects of category I organs.<br>Developmental effects without maternal effects.                                             | = 9 |
| Major functional effects of category I organs.<br>Developmental effects with maternal effects, reproductive effects, or any evidence of fetotoxicity. | = 8 |
| Definite functional effects of category I organs; severe effects of category II organs.                                                               | = 7 |
| Mild functional effects of category I organs; major effects of category II organs.                                                                    | = 6 |
| Minor functional effects of category I organs; definite effects of category II organs; severe effects of category III organs.                         | = 5 |
| Mild functional effects of category II organs;<br>major effects of category III organs.                                                               | = 4 |
| Minor functional effects on category II organs;<br>definite effects on category III organs.                                                           | = 3 |
| Mild functional effects on category III organs.                                                                                                       | = 2 |
| Minor functional effects of category III organs.                                                                                                      | = 1 |
| No effects recognized.                                                                                                                                | = 0 |

\*Please note the following abbreviation:

mg/kg-d means milligram per kilogram per day.

OPTION 1 (Appendix E)

| <u>Category</u>                            | <u>Number of Chemicals</u> |
|--------------------------------------------|----------------------------|
| IJC List (no de minimis)                   | 11                         |
| Known Human Carcinogens (no de minimis)    | 7                          |
| Extremely Toxic Chemicals (no de minimis)  | 11                         |
| Probable Human Carcinogens (no de minimis) | 20                         |
| Highly Toxic Chemicals (no de minimis)     | <u>30</u>                  |
| Total                                      | 79                         |

OPTION 2 (Appendix F)

| <u>Category</u>                                     | <u>Number of Chemicals</u> |
|-----------------------------------------------------|----------------------------|
| IJC List (no de minimis)                            | 11                         |
| Known Human Carcinogens (no de minimis)             | 7                          |
| Extremely Toxic Chemicals (no de minimis)           | 11                         |
| Probable Human Carcinogens<br>(over 1 tpy* emitted) | 15                         |
| Highly Toxic Chemicals (over 1 tpy emitted)         | <u>21</u>                  |
| Total                                               | 65                         |

OPTION 3 (Appendix G)

| <u>Category</u>                                    | <u>Number of Chemicals</u> |
|----------------------------------------------------|----------------------------|
| IJC List (no de minimis)                           | 11                         |
| Known Human Carcinogens (no de minimis)            | 7                          |
| Extremely Toxic Chemicals (no de minimis)          | 11                         |
| Probable Human Carcinogens<br>(over 1 tpy emitted) | 15                         |
| Highly Toxic Chemicals<br>(over 10 tpy emitted)    | <u>12</u>                  |
| Total                                              | 56                         |

\*Please note the following abbreviation:

"tpy" means tons per year.

4) probable human carcinogens identified by the sources listed in the Cancer Potential Section; and 5) chemicals with a toxicity potential score of 6 to 10 (noted as "highly toxic chemicals").

IEPA presents four options for consideration. For purposes of developing these options, some general guidelines were used. The number of chemicals in each category is taken from the SARA 313 Inventory, the Illinois Inventory (those not subject to trade secret claims), and the IJC List. The entire IJC List is presented in each option, without a de minimis level, to reflect Governor Thompson's prior commitments pursuant to the Great Lakes Toxic Substances Control Agreement, dated May 21, 1986. Possible human carcinogens were not considered for inclusion in any of the options because the results of the animal studies conducted on these chemicals, while suggestive, are not conclusive. Chemicals with toxicity potential scores of 1-5 were not considered for inclusion in any of the options at this time because they are not considered by the IEPA to be of primary concern. (Please see Appendix D for an in-depth analysis of the supporting rationale.)

A separate appendix is presented for each of the four options. These appendixes contain the chemical name, CAS number, the list from which the chemical was identified, total emissions (in tons per year), the number of Illinois facilities reporting the chemicals, the cancer potential, and the toxicity potential scores (including the acute lethality score, subacute toxicity score and systemic toxicity score).

The IEPA also wants to recognize four chemicals of concern that are not included in any of the options but are, nevertheless, believed to be worthy of some continued consideration. While these chemicals do not fit within the IEPA proposed generic protocol, they do foster certain concerns which are deserving of further discussion. (Please see Appendix I for a discussion of these chemicals.)

#### FUTURE CHANGES TO THE PROPOSED LIST

This phase of the air toxics program in Illinois begins with the promulgation of the list by the Illinois Pollution Control Board. As toxicological knowledge increases and as inventories are further refined, changes to the original list will be in order.

One example of why refinements to the original list will be required is that SARA 313 reporting will continue to take place. SARA Section 313(f)(1) states the threshold amounts for purposes of reporting toxic chemicals. For a toxic chemical used at a facility, 10,000 pounds a year is the threshold. For a toxic chemical manufactured or processed at a facility, there is a three step process which includes the elements of time and quantity of emissions. First, facilities manufacturing or processing 75,000 pounds per year were required to submit SARA 313 reporting on or before July 1, 1988. Second, facilities manufacturing or processing 50,000 pounds per year are required to submit SARA 313 reporting on or before July 1, 1989. Finally, facilities manufacturing or processing 25,000 pounds per year are required to submit SARA 313 reporting on or before July 1, 1990.

Since updating the original list will be necessary, from time to time, IEPA proposes that the criteria dealing with human health impacts to add on to and delete from the list be the same emissions criterion and human health

#### OPTION 4 (Appendix H)

| <u>Category</u>                                     | <u>Number of Chemicals</u> |
|-----------------------------------------------------|----------------------------|
| IJC List (no de minimis)                            | 11                         |
| Known Human Carcinogens (no de minimis)             | 7                          |
| Extremely Toxic Chemicals (no de minimis)           | 7 u?                       |
| Probable Human Carcinogens<br>(over 10 tpy emitted) | 9                          |
| Highly Toxic Chemicals<br>(over 10 tpy emitted)     | <u>12</u>                  |
| Total                                               | 46                         |

These options reflect various alternatives. At this time, IEPA views the use of Option 2 as the best choice because it most reasonably fulfills the requirements of Section 9.5. The rationale for this choice is as follows:

- (1) All eleven chemicals on the IJC List should be included pursuant to Governor Thompson's prior agreements.
- (2) Known human carcinogens and extremely toxic chemicals should be included on the proposed list without a de minimis level due to the severity of the human health effects of even small amounts of these substances.
- (3) Probable human carcinogens and highly toxic chemicals should be included on the proposed list with a one ton per year exemption level. Although these chemicals represent a lesser degree of concern, emitted at that level they may cause or significantly contribute to an increase in serious irreversible or incapacitating reversible illness.

IEPA is open to all suggestions and has not made any final decisions regarding Option 2 or any other option. Therefore, comments regarding all four options will be appreciated.

criterion as the original list. In other words, these two criteria should be used as a human health generic protocol to expeditiously identify toxic air contaminants after the initial list is adopted.

#### OTHER STATE AND FEDERAL

##### PROGRAMS

Illinois' proposed list can be considered in light of other federal and state air toxic programs. Such a comparison may be helpful to provide a broader base from which to view a proposed list for Illinois.

A part of the current federal regulatory air toxics program is called the National Emission Standards for Hazardous Air Pollutants ("NESHAPs"). Established by Section 112 of the Clean Air Act (42 U.S.C.A. par. 7401 et seq. (1983)), the NESHAPs program requires USEPA to identify, investigate, and promulgate national emission standards for hazardous air pollutants. Over the last 18 years, only 8 substances have been listed as hazardous air pollutants: asbestos, arsenic, benzene, beryllium, coke oven emissions, mercury, radionuclides, and vinyl chloride.

Many professionals argue that the NESHAPs program has failed. The IEPA agrees with these assessments as well. Section 112 of the Clean Air Act requires the Administrator of USEPA to list as hazardous those pollutants which, in his judgment, cause or contribute to air pollution that may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness. The listing of a pollutant triggers the Administrator's responsibility to develop emission standards that will protect public health with an "ample margin of safety". The tight time tables for promulgation of standards, one year after listing a

substance as a hazardous air pollutant, and the literal interpretation of the "ample margin of safety" provision are the focal points of the failure of the NESHAPs program.

Concern over USEPA's inability to address the hazardous air pollution problem prompted Congress to hold hearings and ask the General Accounting Office ("GAO") to examine issues related to controlling hazardous air pollution. USEPA identified and reported to Congress a list of 37 substances to which it had given priority attention. The reader may be interested to know that there is approximately a 50% match up between this old federal list and Option 2 presented in this paper. (Please see Appendix J for a list of the 37 substances.) In 1983, only 7 substances had been listed as hazardous and emission standards had been set for just four of those listed substances. Also in 1983, a GAO report pointed out that USEPA has made slow progress in regulating pollutants that pose significant health risks. USEPA agreed that more needed to be done to regulate other hazardous air pollutants.

Prompted by the shortcomings of the NESHAPs program, in May, 1985, USEPA published a study entitled The Air Toxics Problem in the United States: An Analysis of Cancer Risks for Selected Pollutants, EPA 450/1-85-001. After conducting this broad study of health risks associated with exposure to selected air toxics, USEPA announced a new national strategy for addressing the issue - A Strategy to Reduce Risks to Public Health from Air Toxics, June 1985. A component of this strategy was to defer major responsibility for regulating air toxics to the states. It called for the development and expansion of state air toxics programs. Prior to 1985, only approximately 17 states had air toxics programs. Today virtually all state and local air pollution agencies either have or are developing an air toxics program.

passage of Proposition 65, The Safe Drinking Water and Toxics Initiative, by a majority of greater than 2 to 1. This proposition, which addressed carcinogens, teratogens and mutagens, mandated creation of a Governor-appointed Scientific Review Board to list toxic substances. To date, over 300 substances have been listed by this Board subsequent to the passage of Proposition 65 in 1986. California toxics legislation has clearly moved away from its initial NESHAPS chemical-by-chemical approach to adopting lists of air toxicants.

It is clear that there is no one "best list" to protect the public health and welfare of the citizens of all the states. States have developed an air toxics program, including an air toxics list, based on the unique concerns of each state. A differing mix of legislative directives, industry, agriculture, urban development, and available resources has led to the development of many different air toxics lists. However, it seems that one common element of national public concern is to address the human health effects from carcinogens, systemic toxicants, and acute or subacute toxicants. Concern for these substances is clearly reflected in the legislative directive of Section 9.5.

#### CONCLUSION

IEPA is committed to propose a list of toxic air contaminants that fulfills the legislative mandate of Section 9.5 and sets a reasonable basis for the further development of an air toxics program in Illinois. Cooperation among IEPA, industry, environmental groups and other concerned citizens in this effort will ensure that a scientifically sound list is developed that adequately protects human health.

As expected, States have taken various approaches to developing their air toxic programs. Approximately twenty-four states are using or developing a formal list of toxic substances for their air toxics programs. Over one thousand different substances are identified as air toxicants by all these state lists. List sizes range from 9 to over 800 substances. Examples of larger lists include Wisconsin (494 chemicals), Connecticut (850 chemicals), Kentucky (736 chemicals), Nevada (597 chemicals), North Dakota (686 chemicals) and South Carolina (160 chemicals). In certain cases, lists are limited to substances known or believed to be emitted in the state. In other cases, lists are developed using specific toxic criteria.

In general, the older programs, like those in New Jersey and California with 11 and 9 substances respectively, focused first on carcinogens. More recent programs include consideration of acutely toxic substances, teratogens, and mutagens. Therefore, older programs now seem to be expanding their original lists. For example, New Jersey proposed to add 17 substances to their program and are reviewing many others for inclusion. In contrast, Indiana and Ohio have chosen to undertake air toxics programs with a more modest list of pollutants based upon each state's available resources. Indiana and Ohio have chosen to list 28 and 29 substances, respectively. Both states' lists include carcinogens and other toxic substances.

One example of an older program with a limited list of chemicals is California. The California program follows the NESHAPS' chemical-by-chemical approach, with a list of only 9 chemicals. The California list of air toxic chemicals is expected to double within a year. Even so, public reaction to this slow and expensive chemical-by-chemical approach in part resulted in the

# Appendix 8

## Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound                        | CAS No.     | Source <sup>1</sup> |
|-----|---------------------------------------------|-------------|---------------------|
| 1   | 1,1,1-Trichloroethane                       | 000071-55-6 | 313. IEPA           |
| 2   | 1,1,2-Trichloroethane                       | 000079-00-5 | 313                 |
| 3   | 1,1-Dichloroethane                          | 000075-34-3 | IEPA                |
| 4   | 1,2,4-Trimethylbenzene                      | 000075-63-6 | 313                 |
| 5   | 1,2-Butylene oxide                          | 000106-88-7 | IEPA                |
| 6   | 1,2-Dichlorobenzene                         | 000095-50-1 | 313. IEPA           |
| 7   | 1,2-trans-dichloroethene                    | 000156-60-5 | IEPA                |
| 8   | 1,3-Butadiene                               | 000106-99-0 | 313. IEPA           |
| 9   | 1,3-Dichlorobenzene                         | 000541-73-1 | 313                 |
| 10  | 1,4-Butanediol                              | 000110-63-4 | IEPA                |
| 11  | 1,4-Dioxane                                 | 000123-91-1 | 313. IEPA           |
| 12  | 1-Methyl naphthalene                        | 000090-12-0 | IEPA                |
| 13  | 2,4,6-Trinitrotoluene                       | 000118-96-7 | IEPA                |
| 14  | 2,4-D [Acetic acid, (2,4-dichlorophenoxy)-] | 000094-75-7 | 313. IEPA           |
| 15  | 2,4-Dichlorophenoxyacetate, iso-octyl-      | 025168-26-7 | IEPA                |
| 16  | 2-Butoxyethanol                             | 000111-76-2 | IEPA                |
| 17  | 2-Ethoxy ethanol acetate                    | 000111-15-9 | IEPA                |
| 18  | 2-Ethoxyethanol                             | 000110-80-5 | 313. IEPA           |
| 19  | 2-Ethyl-1,3-hexanediol                      | 000094-96-2 | IEPA                |
| 20  | 2-Ethylhexyl acrylate                       | 000103-11-7 | IEPA                |
| 21  | 2-Methoxy ethanol acetate                   | 000110-49-6 | IEPA                |
| 22  | 2-Methoxyethanol                            | 000109-86-4 | 313                 |
| 23  | 2-Methyl naphthalene                        | 000091-57-6 | IEPA                |
| 24  | 2-Nitrophenol                               | 000088-75-5 | 313                 |
| 25  | 2-Nitropropane                              | 000079-46-9 | 313. IEPA           |
| 26  | 2-Propoxy ethanol                           | 002807-30-9 | IEPA                |
| 27  | 4,4'-Isopropylidenediphenol                 | 000080-05-7 | 313                 |
| 28  | 4,4'-Methylenebis(N,N-dimethyl) benzenamine | 000101-61-1 | 313                 |
| 29  | 4,4'-Methylenedianiline                     | 000101-77-9 | 313. IEPA           |
| 30  | 4,4-Diaminodiphenyl ether                   | 000101-80-4 | 313                 |
| 31  | 4-Nitrophenol                               | 000100-02-7 | 313                 |
| 32  | Acenaphthene                                | 000083-32-9 | IEPA                |
| 33  | Acetic acid                                 | 000064-19-7 | IEPA                |
| 34  | Acetone                                     | 000067-64-1 | 313. IEPA, SEChic   |
| 35  | Acetonitrile                                | 000075-05-8 | 313. IEPA           |
| 36  | Acrylamide                                  | 000079-06-1 | 313. IEPA, SEChic   |
| 37  | Acrylic acid                                | 000079-10-7 | 313. IEPA           |
| 38  | Acrylonitrile                               | 000107-13-1 | 313. IEPA           |
| 39  | Alachlor                                    | 015972-60-8 | IEPA                |
| 40  | Alkyl phenate                               |             | IEPA                |
| 41  | Alkylated lead compounds                    |             | IJC                 |
| 42  | Allo-octimenol                              | 000078-70-6 | IEPA                |
| 43  | Allyl alcohol                               | 000107-18-6 | IEPA                |
| 44  | Allyl chloride                              | 000107-05-1 | IEPA                |

APPENDIX A

PRIMARY STANDARD INDUSTRIAL CLASSIFICATION CODE CATEGORIES  
FOR SARA 313 REPORTING

| SIC<br>CODE | SIC<br>CATEGORIES                                  |
|-------------|----------------------------------------------------|
| 20          | FOOD AND KINDRED PRODUCTS                          |
| 21          | TOBACCO PRODUCTS                                   |
| 22          | TEXTILE MILL PRODUCTS                              |
| 23          | APPAREL AND OTHER FINISHED PRODUCTS                |
| 24          | LUMBER AND WOOD PRODUCTS, EXCEPT FURNITURE         |
| 25          | FURNITURES AND FIXTURES                            |
| 26          | PAPER AND ALLIED PRODUCTS                          |
| 27          | PRINTING, PUBLISHING, AND ALLIED INDUSTRIES        |
| 28          | CHEMICALS AND ALLIED PRODUCTS                      |
| 29          | PETROLEUM REFINING AND RELATED INDUSTRIES          |
| 30          | RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS         |
| 31          | LEATHER AND LEATHER PRODUCTS                       |
| 32          | STONE, CLAY, GLASS, AND CONCRETE PRODUCTS          |
| 33          | PRIMARY METAL INDUSTRIES                           |
| 34          | FABRICATED METAL PRODUCTS                          |
| 35          | INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER   |
| 36          | ELECTRONIC AND ELECTRICAL EQUIPMENT AND COMPONENTS |
| 37          | TRANSPORTATION EQUIPMENT                           |
| 38          | INSTRUMENTS AND RELATED PRODUCTS                   |
| 39          | MISCELLANEOUS MANUFACTURING INDUSTRIES             |

Appendix B

Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound            | CAS No.     | Source <sup>1</sup> |
|-----|---------------------------------|-------------|---------------------|
| 89  | Carbon tetrachloride            | 000056-23-5 | 313. IEPA. SEChic   |
| 90  | Carbon tetrafluoride            | 000075-73-0 | IEPA                |
| 91  | Carbosulfan                     | 055235-14-8 | IEPA                |
| 92  | Chloramben                      | 000133-90-4 | 313. IEPA           |
| 93  | Chlordane                       | 000057-74-9 | 313                 |
| 94  | Chlorinated dibenzodioxins      |             | IJC                 |
| 95  | Chlorinated dibenzofurans       |             | IJC                 |
| 96  | Chlorinated trisodium phosphate | 056802-99-4 | IEPA                |
| 97  | Chlorine                        | 007782-50-5 | 313. IEPA           |
| 98  | Chloroacetic acid               | 000079-11-8 | 313                 |
| 99  | Chlorobenzene                   | 000108-90-7 | 313. IEPA           |
| 100 | Chlorodifluoromethane           | 000075-45-6 | IEPA                |
| 101 | Chloroethane                    | 000075-00-3 | 313. IEPA           |
| 102 | Chloroform                      | 000067-66-3 | 313. IEPA. SEChic   |
| 103 | Chloromethane                   | 000074-87-3 | 313. IEPA. SEChic   |
| 104 | Chloropentafluoroethane         | 000076-15-3 | IEPA                |
| 105 | Chlorpyrifos                    | 002921-88-2 | IEPA                |
| 106 | Chromium (III)                  | 016065-83-1 | IEPA                |
| 107 | Chromium (VI)                   | 018540-29-9 | IEPA                |
| 108 | Chromium and compounds          | 007440-47-3 | 313. IEPA. SEChic   |
| 109 | Coal tar volatiles              | 008007-43-2 | IEPA                |
| 110 | Cobalt and compounds            | 007440-48-4 | 313. IEPA           |
| 111 | Coke oven emissions             |             | SEChic              |
| 112 | Copper                          | 007440-50-8 | 313. IEPA           |
| 113 | Cresol (mixed isomers)          | 001319-77-3 | 313. IEPA           |
| 114 | Cresol, o-                      | 000095-48-7 | 313. IEPA           |
| 115 | Cumene                          | 000098-82-8 | 313. IEPA           |
| 116 | Cumene hydroperoxide            | 000080-13-9 | 313                 |
| 117 | Cyanazine                       | 021725-46-2 | IEPA                |
| 118 | Cyanide                         | 000057-12-5 | IEPA                |
| 119 | Cyanide and compounds           | 000057-12-5 | 313                 |
| 120 | Cyclohexane                     | 000110-82-7 | 313                 |
| 121 | Cyclohexanone                   | 000108-94-1 | IEPA                |
| 122 | Cyclohexylamine                 | 000108-91-8 | IEPA                |
| 123 | DDT                             | 000050-29-3 | IJC                 |
| 124 | Di(2-ethylhexyl) phthalate      | 000117-81-7 | 313                 |
| 125 | Diacetone alcohol               | 000123-42-2 | IEPA                |
| 126 | Diammonium phosphate            | 007783-28-0 | IEPA                |
| 127 | Diazinon                        | 000333-41-5 | IEPA                |
| 128 | Dibenzofuran                    | 000132-64-9 | 313. IEPA           |
| 129 | Dibutyl maleate                 | 000105-76-0 | IEPA                |
| 130 | Dibutyl phthalate               | 000084-74-2 | 313                 |
| 131 | Dichlorodifluoromethane         | 000075-71-8 | IEPA                |
| 132 | Dichlorofluoromethane           | 000075-43-4 | IEPA                |

# Appendix B

## Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound      | CAS No.     | Source <sup>1</sup> |
|-----|---------------------------|-------------|---------------------|
| 45  | Aluminum                  | 007429-90-5 | 313, IEPA           |
| 46  | Aluminum oxide            | 001344-28-1 | 313                 |
| 47  | Ammonia                   | 007664-41-7 | 313, IEPA           |
| 48  | Ammonium chloride         | 012125-02-9 | IEPA                |
| 49  | Ammonium difluoride       | 001341-49-7 | IEPA                |
| 50  | Ammonium nitrate          | 006484-52-2 | 313                 |
| 51  | Ammonium sulfate          | 007783-20-2 | 313                 |
| 52  | Amyl acetate              | 000628-63-7 | IEPA                |
| 53  | Aniline                   | 000062-53-3 | 313, IEPA           |
| 54  | Aniline, N-formyl-        | 000103-70-8 | IEPA                |
| 55  | Anthracene                | 000120-12-7 | 313, IEPA           |
| 56  | Antimony                  | 007440-36-0 | 313, IEPA           |
| 57  | Antimony pentafluoride    | 007783-70-2 | IEPA                |
| 58  | Arsenic and compounds     | 007440-38-2 | 313, IEPA, SEChic   |
| 59  | Asbestos (friable)        | 001332-21-4 | 313                 |
| 60  | Asphalt (petroleum) fumes | 008052-42-4 | IEPA                |
| 61  | Atrazine                  | 001912-24-9 | IEPA                |
| 62  | Barium                    | 007440-39-3 | 313, IEPA           |
| 63  | Benefin                   | 003567-95-1 | IEPA                |
| 64  | Benzene                   | 000071-43-2 | 313, IEPA, SEChic   |
| 65  | Benzo(a)pyrene            | 000050-32-8 | IJC                 |
| 66  | Benzoic acid              | 000065-85-0 | IEPA                |
| 67  | Benzyl chloride           | 000100-44-7 | 313, IEPA, SEChic   |
| 68  | Beryllium                 | 007440-41-7 | IEPA, SEChic        |
| 69  | Biphenyl                  | 000092-52-4 | 313, IEPA           |
| 70  | Bis(2-ethylhexyl) adipate | 000103-23-1 | 313                 |
| 71  | Boron trichloride         | 010294-35-5 | IEPA                |
| 72  | Boron trifluoride         | 007637-07-2 | IEPA                |
| 73  | Bromacil                  | 000314-40-9 | IEPA                |
| 74  | Bromine                   | 007726-95-6 | IEPA                |
| 75  | Butane                    | 000106-97-8 | IEPA                |
| 76  | Butyl acrylate            | 000141-32-2 | 313, IEPA           |
| 77  | Butyl benzyl phthalate    | 000085-68-7 | 313                 |
| 78  | Butyl carbitol            | 000112-34-5 | IEPA                |
| 79  | Butylatein                | 002008-41-5 | IEPA                |
| 80  | Butylcarbinol acetate     | 000124-17-4 | IEPA                |
| 81  | Cadmium and compounds     | 007440-43-9 | 313, IEPA, SEChic   |
| 82  | Cadmium oxide             | 001306-19-0 | IEPA                |
| 83  | Calcium silicate          | 001344-95-2 | IEPA                |
| 84  | Caprolactam               | 000105-60-2 | IEPA                |
| 85  | Captan                    | 000133-06-2 | IEPA                |
| 86  | Carbofuran                | 001563-66-2 | IEPA                |
| 87  | Carbon black              | 001333-86-4 | IEPA                |
| 88  | Carbon disulfide          | 000075-15-0 | 313, IEPA           |

# Appendix B

## Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound       | CAS No.     | Source <sup>1</sup> |
|-----|----------------------------|-------------|---------------------|
| 177 | Glycerin                   | 000056-81-5 | IEPA                |
| 178 | Heptane                    | 000142-82-5 | IEPA                |
| 179 | Hexachlorobenzene          | 000118-74-1 | IJC                 |
| 180 | Hexachlorocyclopentadiene  | 000077-47-4 | 313, IEPA           |
| 181 | Hexamethylene diisocyanate | 000822-06-0 | IEPA                |
| 182 | Hexylene glycol            | 000107-41-5 | IEPA                |
| 183 | Hydrazine                  | 000302-01-2 | 313                 |
| 184 | Hydrocyanic acid           | 000074-90-8 | 313, IEPA           |
| 185 | Hydrogen bromide           | 010035-10-6 | IEPA                |
| 186 | Hydrogen chloride          | 007647-01-0 | 313, IEPA           |
| 187 | Hydrogen fluoride          | 007664-39-3 | 313, IEPA           |
| 188 | Hydrogen peroxide          | 007722-84-1 | IEPA                |
| 189 | Hydrogen sulfide           | 007783-06-4 | IEPA                |
| 190 | Hydroquinone               | 000123-31-9 | 313                 |
| 191 | Hydroxy ethyl acrylate     | 000818-61-1 | IEPA                |
| 192 | Isobutane                  | 000075-28-5 | IEPA                |
| 193 | Isobutanol                 | 000078-83-1 | IEPA                |
| 194 | Isobutyl acetate           | 000110-19-0 | IEPA                |
| 195 | Isobutyraldehyde           | 000078-84-2 | 313                 |
| 196 | Isooctanol                 | 026952-21-6 | IEPA                |
| 197 | Isopentane                 | 000078-78-4 | IEPA                |
| 198 | Isophorone diisocyanate    | 004098-71-9 | IEPA                |
| 199 | Isopropyl acetate          | 000108-21-4 | IEPA                |
| 200 | Isopropyl alcohol          | 000067-63-0 | 313, IEPA           |
| 201 | Isopropylamine             | 000075-31-0 | IEPA                |
| 202 | Lead and compounds         | 007439-92-1 | 313, IEPA           |
| 203 | Lead chromate              | 007758-97-6 | IEPA                |
| 204 | Lignosulfonic acid         | 008061-51-6 | IEPA                |
| 205 | Linuron                    | 000330-55-2 | IEPA                |
| 206 | Lithium hydroxide          | 001310-65-2 | IEPA                |
| 207 | m-Cresol                   | 000108-39-4 | 313                 |
| 208 | m-Nitrochlorobenzene       | 000121-73-3 | IEPA                |
| 209 | m-Xylene                   | 000108-38-3 | 313                 |
| 210 | Malathion                  | 000121-75-5 | IEPA                |
| 211 | Maleic anhydride           | 000108-31-6 | 313, IEPA           |
| 212 | Manganese                  | 007439-96-5 | 313                 |
| 213 | Melamine                   | 000108-78-1 | 313, SEChic         |
| 214 | Mercury                    | 007439-97-6 | IJC, 313, IEPA      |
| 215 | Methacrylic acid           | 000079-41-4 | IEPA                |
| 216 | Methanol                   | 000067-56-1 | 313, IEPA           |
| 217 | Methoxychlor               | 000072-43-5 | IEPA                |
| 218 | Methyl acrylate            | 000096-33-3 | 313, IEPA           |
| 219 | Methyl amyl ketone         | 000110-43-0 | IEPA                |
| 220 | Methyl ethyl ketone        | 000078-93-3 | 313, IEPA           |

# Appendix B

## Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound                     | CAS No.     | Source <sup>1</sup> |
|-----|------------------------------------------|-------------|---------------------|
| 133 | Dichlorotetrafluoroethane                | 000076-14-2 | IEPA                |
| 134 | Dichlorvos                               | 000062-73-7 | IEPA                |
| 135 | Dieldrin                                 | 000060-57-1 | IJC                 |
| 136 | Diethanolamine                           | 000111-42-2 | 313. IEPA. SEChic   |
| 137 | Diethyl sulfate                          | 000064-67-5 | 313                 |
| 138 | Diethylene glycol                        | 000111-46-6 | IEPA                |
| 139 | Diethylenetriamine                       | 000111-40-0 | IEPA                |
| 140 | Diethylethanolamine                      | 000100-37-8 | IEPA                |
| 141 | Diisobutyl ketone                        | 000108-83-8 | IEPA                |
| 142 | Dimethoxypropane                         | 000077-76-9 | IEPA                |
| 143 | Dimethyl acetamide                       | 000127-19-5 | IEPA                |
| 144 | Dimethyl phthalate                       | 000131-11-3 | 313                 |
| 145 | Dimethyl polysiloxane                    |             | IEPA                |
| 146 | Dimethyl sulfate                         | 000077-78-1 | 313. IEPA           |
| 147 | Dimethylamine                            | 000124-40-3 | IEPA                |
| 148 | Diphenylamine                            | 000122-39-4 | IEPA                |
| 149 | Dipropylene glycol                       | 000110-98-5 | IEPA                |
| 150 | Disulfoton                               | 000298-04-4 | IEPA                |
| 151 | Diuron                                   | 000330-54-1 | IEPA                |
| 152 | Divinyl benzene                          | 001321-74-0 | IEPA                |
| 153 | EDBC                                     | 008018-01-7 | IEPA                |
| 154 | Endothall                                | 000145-73-3 | IEPA                |
| 155 | Epichlorohydrin                          | 000106-89-8 | 313. IEPA. SEChic   |
| 156 | Ethalfuralin                             | 055283-68-6 | IEPA                |
| 157 | Ethanol                                  | 000064-17-5 | IEPA                |
| 158 | Ethyl acetate                            | 000141-78-6 | IEPA                |
| 159 | Ethyl acrylate                           | 000140-88-5 | 313. IEPA. SEChic   |
| 160 | Ethyl ether                              | 000060-29-7 | IEPA                |
| 161 | Ethyl hexanol                            | 000104-76-7 | IEPA                |
| 162 | Ethylbenzene                             | 000100-41-4 | 313. IEPA           |
| 163 | Ethylene                                 | 000074-85-1 | 313. IEPA           |
| 164 | Ethylene dichloride                      | 000107-06-2 | 313. IEPA           |
| 165 | Ethylene glycol                          | 000107-21-1 | 313. IEPA           |
| 166 | Ethylene oxide                           | 000075-21-8 | 313. IEPA. SEChic   |
| 167 | Ethylenediamine                          | 000107-15-3 | IEPA                |
| 168 | Etridiazole                              | 002593-15-9 | IEPA                |
| 169 | Fluoranthene                             | 000206-44-0 | IEPA                |
| 170 | Fluorene                                 | 000086-73-7 | IEPA                |
| 171 | Fluorine                                 | 007782-41-4 | IEPA                |
| 172 | FMC-67825                                | 095465-99-9 | IEPA                |
| 173 | Formaldehyde                             | 000050-00-0 | 313. IEPA. SEChic   |
| 174 | Freon 113                                | 000076-13-1 | 313. IEPA           |
| 175 | Gasoline                                 | 008006-61-9 | IEPA. SEChic        |
| 176 | Gluteraldehyde, activated or unactivated | 000111-30-8 | IEPA                |

Appendix B

Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound                      | CAS No.     | Source <sup>1</sup> |
|-----|-------------------------------------------|-------------|---------------------|
| 265 | p-Xylene                                  | 000106-42-3 | 313                 |
| 266 | Palygorskite                              | 012714-11-7 | IEPA                |
| 267 | Pendimethalin                             | 04 17-42-1  | IEPA                |
| 268 | Pentachlorophenol                         | 00 7-86-5   | SEChic              |
| 269 | Pentamadiene                              |             | IEPA                |
| 270 | Pentane                                   | 000109-66-0 | IEPA                |
| 271 | Peracetic acid                            | 000079-21-0 | 313                 |
| 272 | Permethrin                                | 052645-51-1 | IEPA                |
| 273 | Petroleum distillate                      | 008030-30-6 | IEPA                |
| 274 | Phenanthrene                              | 000085-01-8 | IEPA                |
| 275 | Phenol                                    | 000108-95-2 | 313, IEPA           |
| 276 | Phorate                                   | 000298-02-2 | IEPA                |
| 277 | Phosgene                                  | 000075-44-5 | IEPA                |
| 278 | Phosphoric acid                           | 007664-38-2 | 313, IEPA           |
| 279 | Phosphoric acid                           | 013598-36-2 | IEPA                |
| 280 | Phosphorus                                | 007723-14-0 | 313                 |
| 281 | Phosphorus oxychloride                    | 010025-87-3 | IEPA                |
| 282 | Phosphorus pentachloride                  | 010026-13-8 | IEPA                |
| 283 | Phosphorus trichloride                    | 007719-12-2 | IEPA                |
| 284 | Phthalic anhydride                        | 000085-44-9 | 313, IEPA           |
| 285 | Polychlorinated biphenyls (PCBs)          | 001336-36-3 | IJC, SEChic         |
| 286 | Polycyclic organic matter                 |             | SEChic              |
| 287 | Potassium carbonate                       | 000584-18-7 | IEPA                |
| 288 | Potassium hydroxide                       | 001310-58-3 | IEPA                |
| 289 | Propane                                   | 000074-98-6 | IEPA                |
| 290 | Propionaldehyde                           | 000123-38-6 | 313                 |
| 291 | Propoxur                                  | 000114-26-1 | IEPA                |
| 292 | Propylene (Propene)                       | 000115-07-1 | 313                 |
| 293 | Propylene glycol                          | 000057-55-6 | IEPA                |
| 294 | Propylene glycol methyl acetate           | 000108-65-6 | IEPA                |
| 295 | Propylene glycol monomethyl ether         | 000107-98-2 | IEPA                |
| 296 | Propylene oxide                           | 000075-56-9 | 313, IEPA, SEChic   |
| 297 | Pyrene                                    | 000129-00-0 | IEPA                |
| 298 | Pyridine                                  | 000110-86-1 | IEPA                |
| 299 | Quinoline                                 | 000091-22-5 | 313                 |
| 300 | s-Ethyl-N,N-dipropyl thiocarbamate (EDTC) | 000759-94-4 | IEPA                |
| 301 | sec-Butyl alcohol                         | 000078-92-2 | 313, IEPA           |
| 302 | Selenium                                  | 007782-49-2 | 313, IEPA           |
| 303 | Selenium disulfide                        | 007788-56-4 | IEPA                |
| 304 | Silver                                    | 007440-22-4 | IEPA                |
| 305 | Sodium borate                             | 001303-96-4 | IEPA                |
| 306 | Sodium fluoride                           | 007681-49-4 | IEPA                |
| 307 | Sodium hydroxide                          | 001310-73-2 | 313, IEPA           |
| 308 | Sodium nitrate                            | 007631-99-4 | IEPA                |

# Appendix B

## Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound           | CAS No.     | Source <sup>1</sup> |
|-----|--------------------------------|-------------|---------------------|
| 221 | Methyl ethyl ketone peroxide   | 001338-23-4 | IEPA                |
| 222 | Methyl isoamyl ketone          | 000110-12-3 | IEPA                |
| 223 | Methyl isobutyl carbinol       | 000108-11-2 | IEPA                |
| 224 | Methyl isobutyl ketone         | 000108-10-1 | 313, IEPA           |
| 225 | Methyl mercaptan               | 000074-93-1 | IEPA                |
| 226 | Methyl methacrylate            | 000080-62-6 | 313, IEPA           |
| 227 | Methyl propyl ketone           | 000107-87-9 | IEPA                |
| 228 | Methyl styrene                 | 000098-83-9 | IEPA                |
| 229 | Methyl tert-butyl ether        | 001634-04-4 | 313                 |
| 230 | Methylamine                    | 000074-89-5 | IEPA                |
| 231 | Methylcyclopentane             | 000096-37-7 | IEPA                |
| 232 | Methylene chloride             | 000075-09-2 | 313, IEPA, SEChic   |
| 233 | Methylenebis(phenylisocyanate) | 000101-68-8 | 313, IEPA           |
| 234 | Metolachlor                    | 051218-45-2 | IEPA                |
| 235 | Metribuzin                     | 021087-64-9 | IEPA                |
| 236 | Mirex                          | 002385-85-5 | IJC                 |
| 237 | Molybdenum                     | 007439-38-7 | IEPA                |
| 238 | Molybdenum trioxide            | 001313-27-5 | 313                 |
| 239 | Monoammonium phosphate         |             | IEPA                |
| 240 | Monoethanol amine              | 000141-43-5 | IEPA                |
| 241 | Monomethyl ether               | 034590-94-8 | IEPA                |
| 242 | Morpholine                     | 000110-91-8 | IEPA                |
| 243 | n-Butyl acetate                | 000123-86-4 | IEPA                |
| 244 | n-Butyl alcohol                | 000071-36-3 | 313, IEPA           |
| 245 | n-Hexane                       | 000110-54-3 | IEPA                |
| 246 | N-Nitrosodiphenylamine         | 000086-30-6 | IEPA                |
| 247 | n-Propanol                     | 000071-23-8 | IEPA                |
| 248 | n-Propyl acetate               | 000109-60-4 | IEPA                |
| 249 | Naphthalene                    | 000091-20-3 | 313, IEPA           |
| 250 | Nickel and compounds           | 007440-02-0 | 313, IEPA, SEChic   |
| 251 | Nitric acid                    | 007697-37-2 | 313, IEPA           |
| 252 | Nitrobenzene                   | 000098-95-3 | SEChic              |
| 253 | Nitroglycerin                  | 000055-63-0 | IEPA                |
| 254 | Nitromethane                   | 000075-52-5 | IEPA                |
| 255 | Nylon                          | 063428-83-1 | IEPA                |
| 256 | o-Nitrochlorobenzene           | 000088-73-3 | IEPA                |
| 257 | o-Xylene                       | 000095-47-6 | 313                 |
| 258 | Oxalic acid                    | 000144-62-7 | IEPA                |
| 259 | p-Cresidine                    | 000120-71-8 | 313                 |
| 260 | p-Cresol                       | 000106-44-5 | 313, IEPA           |
| 261 | p-Dichlorobenzene              | 000106-46-7 | 313, IEPA           |
| 262 | p-Nitroaniline                 | 000100-01-6 | IEPA                |
| 263 | p-Nitrochlorobenzene           | 000100-00-5 | IEPA                |
| 264 | p-Toluene sulfonyl chloride    | 000098-59-9 | IEPA                |

Appendix B

Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound   | CAS No.     | Source <sup>1</sup> |
|-----|------------------------|-------------|---------------------|
| 353 | Vinyl acetate monomer  | 000108-05-4 | 313, IEPA           |
| 354 | Vinyl chloride         | 000075-01-4 | 313, IEPA           |
| 355 | Vinylidene chloride    | 00 75-35-4  | 313, IEPA           |
| 356 | M & P Naptha           | 000032-32-4 | IEPA                |
| 357 | Xylene (mixed isomers) | 001330-20-7 | 313, IEPA, SEChic   |
| 358 | Zinc                   | 007440-66-6 | 313, IEPA           |
| 359 | Zinc phosphate         | 007779-90-0 | IEPA                |
| 360 | Zinc stearate          | 000557-05-1 | IEPA                |
| 361 | Zirconium              | 007440-67-7 | IEPA                |

1. Source

IJC - International Joint Commission List  
313 - SARA 313 Inventory  
IEPA - Illinois EPA Air Toxics Inventory  
SEChic - Southeast Chicago Inventory

APPB REP

MWS

Appendix B

Universe of Chemicals Considered for Inclusion in Air Toxics List

| No. | Chemical or Compound        | CAS No.     | Source <sup>1</sup> |
|-----|-----------------------------|-------------|---------------------|
| 309 | Sodium persulfate           | 007775-27-1 | IEPA                |
| 310 | Sodium phosphate, dibasic   | 007558-79-4 | IEPA                |
| 311 | Sodium silica fluoride      | 016893-85-9 | IEPA                |
| 312 | Sodium sulfate              | 007757-82-6 | 313. IEPA           |
| 313 | Sodium toluenesulfonic acid | 000824-79-3 | IEPA                |
| 314 | Styrene                     | 000100-42-5 | 313. IEPA. SEChic   |
| 315 | Sulfur                      | 007704-34-9 | IEPA                |
| 316 | Sulfur hexafluoride         | 002551-62-4 | IEPA                |
| 317 | Sulfur trioxide             | 007446-11-9 | IEPA                |
| 318 | Sulfuric acid               | 007664-93-9 | 313. IEPA           |
| 319 | Tenamene                    | 003081-14-9 | IEPA                |
| 320 | Terbufos                    | 013071-79-9 | IEPA                |
| 321 | Terephthalic acid           | 000100-21-0 | 313                 |
| 322 | tert-Butyl alcohol          | 000075-65-0 | 313. IEPA           |
| 323 | Tetrachloroethylene         | 000127-18-4 | 313. IEPA. SEChic   |
| 324 | Tetraethylenepentamine      | 000112-57-2 | IEPA                |
| 325 | Tetrahydrofuran             | 000109-99-9 | IEPA                |
| 326 | Thiofuran                   | 000110-02-1 | IEPA                |
| 327 | Thionyl chloride            | 007719-09-7 | IEPA                |
| 328 | Thiophanate methyl          | 023564-05-8 | IEPA                |
| 329 | Thiophenol                  | 000108-98-5 | IEPA                |
| 330 | Thorium dioxide             | 001314-20-1 | IEPA                |
| 331 | Tin                         | 007440-31-5 | IEPA                |
| 332 | Titanium                    | 007440-32-6 | IEPA                |
| 333 | Titanium dioxide            | 013463-67-7 | 313. SEChic         |
| 334 | Toluene                     | 000108-88-3 | 313. IEPA           |
| 335 | Toluene-2,4-diisocyanate    | 000584-84-9 | 313. IEPA           |
| 336 | Toluene-2,6-diisocyanate    | 000091-08-7 | IEPA                |
| 337 | Toxaphene                   | 008001-35-2 | IJC                 |
| 338 | Triammonium phosphate       |             | IEPA                |
| 339 | Tributylamine               | 000102-82-9 | IEPA                |
| 340 | Trichloroethylene           | 000079-01-6 | 313. IEPA. SEChic   |
| 341 | Trichlorofluoromethane      | 000075-69-4 | IEPA                |
| 342 | Trichloroisocyanouric acid  | 000087-90-1 | IEPA                |
| 343 | Triethyl phosphate          | 000078-40-0 | IEPA                |
| 344 | Triethylene tetramine       | 000112-24-3 | IEPA                |
| 345 | Trifluralin                 | 001582-09-8 | 313. IEPA           |
| 346 | Trimethyl benzene           | 025551-13-7 | IEPA                |
| 347 | Trimethylamine              | 000075-50-3 | IEPA                |
| 348 | Tungsten                    | 007440-33-7 | IEPA                |
| 349 | Turpentine                  | 008006-64-2 | IEPA                |
| 350 | Urea                        | 000057-13-6 | IEPA                |
| 351 | Vanadium                    | 007440-62-2 | 313                 |
| 352 | Vegetable Oil               |             | IEPA                |

## APPENDIX D

### BASIS FOR SETTING CUTOFF LEVELS OF HUMAN HEALTH CRITERION

As stated in this discussion paper, the decision whether or not to list a chemical was made based upon two criteria, an emissions criterion and a human health criterion. The human health criterion is based on a cancer potential and a toxicity potential. A description of how the cancer potential ranking and toxicity potential scoring is presented on pages 9 through 14 of this paper. These criteria allow a means to group chemicals based on their potential to adversely affect human health. However, there does not exist an exact cutoff point on this scale for which the IEPA can emphatically state that chemicals below this point are safe and those above it are hazardous.

The cancer potential ranking is straightforward. It includes three categories: known human carcinogens, probable human carcinogens, and possible human carcinogens. Known human carcinogens and probable human carcinogens warrant inclusion in Illinois' air toxics list. These categories include chemicals for which there exists clear or substantial evidence that there is a causal relationship between exposure to the chemical and increased incidence of cancer. Possible human carcinogens are not considered for listing at this time because the classification of these chemicals is based on limited and inconclusive evidence of cancer in laboratory animals.

The second human health criterion is the toxicity potential. As stated in the discussion paper, the toxicity potential scores can range from a minimum of 1 to a maximum of 15. The focus of the listing process was to identify those substances which present a potential hazard "... from low-level, chronic exposure to toxic air contaminants." (Section 9.5) To this end, the systemic toxicity portion of the toxicity potential score was intentionally weighted to contribute a maximum of 9 out of the 15 points possible. Substances with a toxicity potential score of below 6 were not considered for listing at this time.

To aid in understanding the basis for the cutoff point of 6.0 for the toxicity potential scoring, the following analysis is presented. In order to ensure that chemicals emitted in low level amounts causing chronic health effects are included on the list, the systemic toxicity score must be closely examined. A hypothetical score can be constructed such that the acute lethality and subacute toxicity scores are at their minimum levels (0 and 1, respectively, indicating low likelihood of immediate human health effects from high level exposures). Thus, the decision to include or not include the substance for listing would be determined by the systemic toxicity score.

In examining the systemic toxicity score, both the severity of effects and the lowest toxic dose scores must be considered. Regarding the severity of effects scoring, the protection of category I organs is definitely warranted. This corresponds to a minimum systemic severity of effects score of 5.0. The lowest toxic dose score includes the values 1, 2, 3, and 4. When these lowest toxic dose numbers are multiplied by the severity of effects score of 5.0 and the sum multiplied by .25, they yield total systemic toxicity scores of 1.25, 2.50, 3.75, and 5.0, respectively. Because Section 9.5 emphasizes low-level, chronic exposures, the lowest dose score of 4.0 was selected for the hypothetical substance.

## Appendix C

### Ranking of Organs for Systemic Toxicity Scoring

- Category I - Includes organs, the impairment or loss of which is fatal and usually cannot be compensated for. Also includes gonads, loss of which prevents reproduction.

Lungs, Heart, Central Nervous System (Brain/Spinal Cord), Kidneys, Liver, Bone Marrow, Gonads

- Category II - Includes organs whose loss or impairment may be fatal, but which can be compensated for by drug or replacement therapy. Also includes organs, the impairment or loss of which indicates an adverse effect on immune function or hematopoietic function which may be life threatening.

Adrenals, Thyroids, Parathyroids, Pituitary, Pancreas, Esophagus, Stomach, Small Intestine, Large Intestine, Lymph Nodes, Spleen, Thymus, Trachea, Pharynx, Urinary Bladder, Skin

- Category III - Impairment or loss of any of these organs is not life threatening but may result in severe functional or emotional handicaps.

Accessory reproductive organs (Oviduct, Epididymides, Uterus, Prostate, Seminal Vesicle, Ductus Deferens, Penis, Vagina), Eyes, Bone, Nose, Peripheral Nerves, Muscles, Urinary Bladder, Blood Vessels, Ear, Gallbladder, Larynx, Mammary Gland, Salivary Glands, Tongue, Teeth, Ureter, Urethra

Appendix E

Option 1 Air Toxics List

| No. | Chemical                                     | CAS Number  | Source            | Total Emiss. Ton/yr. | Num. Facil. | Cancer Poten. | TOXICITY POTENTIAL SCORES |                   |                   |       |
|-----|----------------------------------------------|-------------|-------------------|----------------------|-------------|---------------|---------------------------|-------------------|-------------------|-------|
|     |                                              |             |                   |                      |             |               | Acute Toxicity            | Subacute Toxicity | Systemic Toxicity | Total |
| 1   | 1,2,4-Trimethylbenzene                       | 000093-63-6 | 313               | 362.95               | 11          | -             | 1                         | 1                 | 6.50              | 6.50  |
| 2   | 1,3-Butadiene                                | 000106-99-0 | 313, IEPA         | 73.90                | 7           | PHC           | 0                         | 2                 | 3.50              | 3.50  |
| 3   | 1,4-Dioxane                                  | 000123-91-1 | 313, IEPA         | 6.36                 | 3           | PHC           | 1                         | 1                 | 3.50              | 3.50  |
| 4   | 2,4,6-Trinitrotoluene                        | 000118-96-7 | IEPA              | 2.40                 | 1           | -             | 1                         | 3                 | 6.00              | 10.00 |
| 5   | 2,4-D                                        | 000094-75-7 | 313, IEPA         | <0.01                | 1           | -             | 2                         | 2                 | 1.75              | 7.75  |
| 6   | 2-Nitrophenol                                | 000088-75-5 | 313               | 13.50                | 1           | -             | 2                         | 1                 | 6.00              | 9.00  |
| 7   | 2-Nitropropane                               | 000079-46-9 | 313, IEPA         | 73.00                | 1           | PHC           | 1                         | 2                 | 6.00              | 9.00  |
| 8   | 4,4'-Diaminodiphenyl ether                   | 000181-80-4 | 313               | 0.25                 | 1           | PHC           | 1                         | 1                 | 1.25              | 3.25  |
| 9   | 4,4'-Methylene dianiline                     | 000101-77-9 | 313, IEPA         | <0.01                | 1           | PHC           | 2                         | 3                 | 4.00              | 9.00  |
| 10  | 4,4'-Methylenebis(N,N-dimethyl) benzeneamine | 000101-61-1 | 313               | 9.09                 | 1           | PHC           | 0                         | 1                 | 0.00              | 1.00  |
| 11  | 4-Nitrophenol                                | 000100-02-7 | 313               | 1.10                 | 1           | -             | 2                         | 1                 | 6.00              | 9.00  |
| 12  | Acrylamide                                   | 000079-06-1 | 313, IEPA, SEChic | <0.01                | 1           | PHC           | 2                         | 3                 | 4.50              | 9.50  |
| 13  | Acrylic acid                                 | 000079-10-7 | 313, IEPA         | 36.70                | 11          | -             | 3                         | 2                 | 2.00              | 7.00  |
| 14  | Acrylonitrile                                | 000107-13-1 | 313, IEPA         | 298.06               | 6           | PHC           | 2                         | 3                 | 7.00              | 12.00 |
| 15  | Alkylated lead compounds                     |             | IJC               |                      |             |               |                           |                   |                   |       |
| 16  | Aniline                                      | 000062-53-5 | 313, IEPA         | 20.26                | 3           | -             | 2                         | 2                 | 5.25              | 9.25  |
| 17  | Arsenic and compounds                        | 007440-38-2 | 313, IEPA, SEChic | 1.25                 | 4           | KNC           | 0                         | 3                 | 3.00              | 6.00  |
| 18  | Asbestos (friable)                           | 001332-21-4 | 313               | 0.08                 | 2           | KNC           | 0                         | 3                 | 1.50              | 4.50  |
| 19  | Benzene                                      | 000071-43-2 | 313, IEPA, SEChic | 676.37               | 21          | -             | 0                         | 2                 | 6.00              | 0.00  |
| 20  | Benzo(a)pyrene                               | 000030-32-0 | IJC               |                      |             |               |                           |                   |                   |       |
| 21  | Biphenyl                                     | 000092-52-4 | 313, IEPA         | 4.01                 | 7           | -             | 1                         | 3                 | 6.75              | 10.75 |
| 22  | Boron fluoride                               | 007637-07-2 | IEPA              | <0.01                | 1           | -             | 2                         | 3                 | 8.00              | 11.00 |
| 23  | Cadmium compounds                            | 007440-43-9 | 313, IEPA, SEChic | 1.63                 | 5           | PHC           | 3                         | 3                 | 5.00              | 11.00 |
| 24  | Caprolactam                                  | 000105-66-2 | IEPA              | 19.20                | 1           | -             | 3                         | 3                 | 0.00              | 6.00  |
| 25  | Carbon disulfide                             | 000075-15-0 | 313, IEPA         | 1185.45              | 3           | -             | 1                         | 2                 | 7.00              | 10.00 |
| 26  | Carbon tetrachloride                         | 000056-23-5 | 313, IEPA, SEChic | 0.12                 | 3           | PHC           | 0                         | 2                 | 3.75              | 5.75  |
| 27  | Chlordane                                    | 000057-74-9 | 313               | 0.44                 | 1           | PHC           | 2                         | 3                 | 8.00              | 13.00 |
| 28  | Chlorinated dibenzodioxins                   |             | IJC               |                      |             |               |                           |                   |                   |       |
| 29  | Chlorinated dibenzofurans                    |             | IJC               |                      |             |               |                           |                   |                   |       |
| 30  | Chloroform                                   | 000067-66-3 | 313, IEPA, SEChic | 1.46                 | 1           | PHC           | 3                         | 2                 | 3.00              | 0.00  |
| 31  | Chromium and compounds                       | 007440-47-3 | 313, IEPA, SEChic | 21.45                | 44          | KNC           | 0                         | 3                 | 5.00              | 0.00  |
| 32  | Coal tar volatiles                           | 000007-45-2 | IEPA              | 13.39                | 2           | KNC           | 0                         | 3                 | 0.00              | 3.00  |
| 33  | Cobalt and compounds                         | 007440-48-4 | 313, IEPA         | 1.04                 | 5           | -             | 0                         | 3                 | 6.00              | 9.00  |
| 34  | Cumene hydroperoxide                         | 000080-15-6 | 313               | 0.51                 | 2           | -             | 2                         | 1                 | 3.50              | 6.50  |
| 35  | Cyclohexanone                                | 000108-94-1 | IEPA              | 0.22                 | 1           | -             | 0                         | 1                 | 5.25              | 6.25  |
| 36  | DDT                                          | 000030-29-5 | IJC               |                      |             |               |                           |                   |                   |       |
| 37  | Di(2-ethylhexyl) phthalate                   | 000117-81-7 | 313               | 2.26                 | 0           | PHC           | 0                         | 2                 | 6.00              | 0.00  |
| 38  | Dibutyl phthalate                            | 000084-74-2 | 313               | 1.25                 | 6           | -             | 0                         | 2                 | 6.00              | 0.00  |
| 39  | Dieldrin                                     | 000066-57-1 | IJC               |                      |             |               |                           |                   |                   |       |
| 40  | Dimethyl sulfate                             | 000077-78-1 | 313, IEPA         | 0.50                 | 1           | PHC           | 1                         | 3                 | 1.25              | 3.25  |
| 41  | Dimethylamine                                | 000124-40-3 | IEPA              | <0.01                |             | -             | 1                         | 2                 | 3.50              | 6.50  |
| 42  | Epichlorohydrin                              | 000106-89-0 | 313, IEPA, SEChic | 4.42                 | 3           | PHC           | 2                         | 2                 | 4.50              | 0.50  |
| 43  | Ethyl acrylate                               | 000140-00-5 | 313, IEPA, SEChic | 4.31                 | 12          | -             | 1                         | 2                 | 3.00              | 6.00  |

This results in a total systemic toxicity score of 5, and a total toxicity potential score of 6. The complete explanation of the scoring is presented below.

LOWEST POSSIBLE TOXICITY POTENTIAL  
PROTECTING CATEGORY I ORGANS

|                                                      |     |
|------------------------------------------------------|-----|
| Actual Lethality Score (see page 11)                 | = 0 |
| Subacute Toxicity Score (see page 12)                | = 1 |
| Systemic Toxicity Score ( $0.25 \times 5 \times 4$ ) | = 5 |
| • Severity of Effects (see page 13) = 5              |     |
| • Lowest Toxic Dose (see page 13) = 4                | —   |
| Lowest Toxicity Potential Score                      | = 6 |

Appendix E

Option 1 Air Toxics List

Notes:

Chemical - Chemical or compound name

CAS Number - Chemical Abstracts Service Number

Source - Source of chemical (SARA 313 inventory,  
Illinois EPA Air Toxics inventory,  
International Joint Commission List, or  
Southeast Chicago Inventory)

Total Emissions - Tons per year of chemical emitted in  
Illinois

Number of facilities - Number of facilities reporting  
emissions of this chemical under  
SARA 313 or to IEPA

Cancer Poten. - Cancer potential  
See text for definition of terms

Acute Toxicity - See text for definition of terms

Subacute Toxicity - See text for definition of terms

Systemic Toxicity - See text for definition of terms

Total - See text for definition of terms

NWS, Opt1.rep

SL 064828

Appendix H

Option 1 Air Toxics List

| No. | Chemical                         | CAS Number  | Source            | Total<br>Emis.<br>Ton/yr. | Num.<br>Facil. | Cancer<br>Poten. | ---TOXICITY POTENTIAL SCORES--- |                      |                      |       |
|-----|----------------------------------|-------------|-------------------|---------------------------|----------------|------------------|---------------------------------|----------------------|----------------------|-------|
|     |                                  |             |                   |                           |                |                  | Acute<br>Toxicity               | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 44  | Ethylene                         | 000074-85-1 | 313, IEPA         | 2720.60                   | 14             | -                | 0                               | 1                    | 7.00                 | 8.00  |
| 45  | Ethylene dichloride              | 000107-06-2 | 313, IEPA         | 16.00                     | 2              | PNC              | 1                               | 2                    | 3.75                 | 6.75  |
| 46  | Ethylene oxide                   | 000075-21-8 | 313, IEPA, SEChic | 175.09                    | 13             | PNC              | 2                               | 3                    | 6.00                 | 11.00 |
| 47  | Fluorine                         | 007782-41-4 | IEPA              | 0.47                      | 1              | -                | 3                               | 3                    | 6.00                 | 6.00  |
| 48  | Formaldehyde                     | 000050-00-0 | 313, IEPA, SEChic | 67.66                     | 29             | PNC              | 2                               | 3                    | 0.00                 | 5.00  |
| 49  | Hexachlorobenzene                | 000118-74-1 | IJC               |                           |                |                  |                                 |                      |                      |       |
| 50  | Hexachlorocyclopentadiene        | 000077-47-4 | 313, IEPA         | 0.20                      | 1              | -                | 3                               | 3                    | 7.00                 | 13.00 |
| 51  | Hydrazine                        | 000302-01-2 | 313               | 0.54                      | 3              | PNC              | 3                               | 3                    | 6.00                 | 12.00 |
| 52  | Hydrogen fluoride                | 007664-39-3 | 313, IEPA         | 67.02                     | 11             | -                | 2                               | 3                    | 1.50                 | 6.50  |
| 53  | Isobutyraldehyde                 | 000076-84-9 | 313               | 1.05                      | 1              | -                | 1                               | 1                    | 4.50                 | 6.50  |
| 54  | Lead and compounds               | 007439-92-1 | 313, IEPA         | 27.54                     | 47             | PNC              | 0                               | 3                    | 6.00                 | 9.00  |
| 55  | Maleic anhydride                 | 000104-31-8 | 313, IEPA         | 251.00                    | 9              | -                | 2                               | 3                    | 1.50                 | 6.50  |
| 56  | Mercury                          | 007439-97-6 | IJC, 313, IEPA    | 0.25                      | 1              | -                | 0                               | 3                    | 6.00                 | 9.00  |
| 57  | Methyl methacrylate              | 000080-62-8 | 313, IEPA         | 9.20                      | 17             | -                | 1                               | 1                    | 4.50                 | 6.50  |
| 58  | Methylene chloride               | 000075-09-2 | 313, IEPA, SEChic | 1304.50                   | 74             | PNC              | 1                               | 1                    | 1.75                 | 3.75  |
| 59  | Methylenebis(phenylisocyanate)   | 000101-60-0 | 313, IEPA         | 26.50                     | 12             | -                | 3                               | 1                    | 2.00                 | 6.00  |
| 60  | Mirex                            | 002385-85-5 | IJC               |                           |                |                  |                                 |                      |                      |       |
| 61  | Molybdenum trioxide              | 001313-27-5 | 313               | 0.45                      | 1              | -                | 2                               | 2                    | 3.75                 | 7.75  |
| 62  | n-Butyl alcohol                  | 000071-36-3 | 313, IEPA         | 612.19                    | 43             | -                | 1                               | 1                    | 4.75                 | 6.75  |
| 63  | Nickel and compounds             | 007440-02-0 | 313, IEPA, SEChic | 14.39                     | 29             | PNC              | 0                               | 3                    | 1.50                 | 4.50  |
| 64  | Nitric acid                      | 007497-37-2 | 313, IEPA         | 89.03                     | 47             | -                | 3                               | 2                    | 1.50                 | 6.50  |
| 65  | p-Cresidine                      | 000120-71-0 | 313               | 0.14                      | 1              | PNC              | 1                               | 1                    | 0.00                 | 2.00  |
| 66  | p-Dichlorobenzene                | 000106-46-7 | 313, IEPA         | 390.11                    | 2              | PNC              | 2                               | 1                    | 1.75                 | 4.75  |
| 67  | Peracetic acid                   | 000079-21-0 | 313               | 0.25                      | 1              | -                | 3                               | 1                    | 5.25                 | 9.25  |
| 68  | Phenol                           | 000106-95-2 | 313, IEPA         | 150.03                    | 24             | -                | 2                               | 2                    | 6.75                 | 10.75 |
| 69  | Phosphorus                       | 007723-14-0 | 313               | 1.25                      | 2              | -                | 3                               | 3                    | 3.00                 | 9.00  |
| 70  | Polychlorinated biphenyls (PCBs) | 001336-36-3 | IJC, SEChic       | 40.01                     | 1              | -                |                                 |                      |                      |       |
| 71  | Selenium and compounds           | 007782-49-2 | 313, IEPA         | 0.50                      | 1              | -                | 1                               | 3                    | 5.00                 | 9.00  |
| 72  | Sodium fluoride                  | 007601-49-4 | IEPA              | 0.42                      | 1              | -                | 2                               | 3                    | 5.00                 | 10.00 |
| 73  | Sulfuric acid                    | 007664-93-9 | 313, IEPA         | 102.70                    | 120            | -                | 2                               | 3                    | 6.00                 | 11.00 |
| 74  | Tetrachloroethylene              | 000127-10-4 | 313, IEPA, SEChic | 756.94                    | 36             | PNC              | 1                               | 1                    | 1.50                 | 3.50  |
| 75  | Toluene-2,4-diisocyanate         | 000584-84-9 | 313, IEPA         | 5.00                      | 11             | -                | 3                               | 3                    | 6.00                 | 12.00 |
| 76  | Toxaphene                        | 008001-35-2 | IJC               |                           |                |                  |                                 |                      |                      |       |
| 77  | Trichloroethylene                | 000079-01-6 | 313, IEPA, SEChic | 1901.00                   | 71             | PNC              | 1                               | 1                    | 4.50                 | 6.50  |
| 78  | Vinyl chloride                   | 000075-01-4 | 313, IEPA         | 69.14                     | 2              | PNC              | 2                               | 2                    | 3.50                 | 7.50  |
| 79  | Vinylidene chloride              | 000075-35-4 | 313, IEPA         | 4.35                      | 1              | -                | 1                               | 2                    | 4.50                 | 7.50  |

Option 2 Air Toxics List

| No. | Chemical                                     | CAS Number  | Source            | Total<br>Emiss.<br>Ton/yr. | Num.<br>Facil. | Cancer<br>Poten. | TOXICITY POTENTIAL SCORES |                      |                      |       |
|-----|----------------------------------------------|-------------|-------------------|----------------------------|----------------|------------------|---------------------------|----------------------|----------------------|-------|
|     |                                              |             |                   |                            |                |                  | Acute<br>Toxicity         | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 1   | 1,2,4-Trimethylbenzene                       | 000093-63-6 | 313               | 362.93                     | 11             | -                | 1                         | 1                    | 4.38                 | 6.38  |
| 2   | 1,3-Butadiene                                | 000106-99-0 | 313, IEPA         | 73.98                      | 7              | PNC              | 0                         | 2                    | 3.56                 | 5.56  |
| 3   | 1,4-Dioxane                                  | 000123-91-1 | 313, IEPA         | 8.38                       | 3              | PNC              | 1                         | 1                    | 3.30                 | 5.30  |
| 4   | 2,4,6-Trinitrotoluene                        | 000118-96-7 | IEPA              | 2.40                       | 1              | -                | 1                         | 1                    | 6.00                 | 10.00 |
| 5   | 2-Nitrophenol                                | 000088-73-5 | 313               | 13.58                      | 1              | -                | 2                         | 1                    | 6.00                 | 9.00  |
| 6   | 2-Nitropropane                               | 000079-46-9 | 313, IEPA         | 71.00                      | 1              | PNC              | 1                         | 2                    | 6.00                 | 9.00  |
| 7   | 4,4'-Methylenebis(N,N-dimethyl) benzeneamine | 000101-81-1 | 313               | 9.09                       | 1              | PNC              | 0                         | 1                    | 0.00                 | 1.00  |
| 8   | 4-Nitrophenol                                | 000100-02-7 | 313               | 1.10                       | 1              | -                | 2                         | 1                    | 6.00                 | 9.00  |
| 9   | Acrylic acid                                 | 000079-10-7 | 313, IEPA         | 36.78                      | 11             | -                | 3                         | 2                    | 2.00                 | 7.00  |
| 10  | Acrylonitrile                                | 000107-13-1 | 313, IEPA         | 298.06                     | 6              | PNC              | 2                         | 3                    | 7.00                 | 12.00 |
| 11  | Alkylated compounds                          |             | IJC               |                            |                |                  |                           |                      |                      |       |
| 12  | Aniline                                      | 000063-43-3 | 313, IEPA         | 28.36                      | 3              | -                | 2                         | 2                    | 5.25                 | 9.25  |
| 13  | Arsenic and compounds                        | 007448-38-2 | 313, IEPA, SEChic | 1.23                       | 4              | RNC              | 0                         | 3                    | 3.00                 | 6.00  |
| 14  | Asbestos (friable)                           | 001332-21-4 | 313               | 8.00                       | 2              | RNC              | 0                         | 3                    | 1.50                 | 4.50  |
| 15  | Benzene                                      | 000071-43-2 | 313, IEPA, SEChic | 676.37                     | 21             | RNC              | 0                         | 2                    | 6.00                 | 8.00  |
| 16  | Benzo(a)pyrene                               | 000050-32-6 | IJC               |                            |                |                  |                           |                      |                      |       |
| 17  | Biphenyl                                     | 000092-52-4 | 313, IEPA         | 4.61                       | 7              | -                | 1                         | 3                    | 6.75                 | 10.75 |
| 18  | Boron trifluoride                            | 007637-07-1 | IEPA              | <0.01                      | 1              | -                | 2                         | 3                    | 6.00                 | 11.00 |
| 19  | Cadmium and compounds                        | 007440-43-9 | 313, IEPA, SEChic | 1.63                       | 3              | PNC              | 3                         | 3                    | 5.00                 | 11.00 |
| 20  | Caprolactam                                  | 000103-66-1 | IEPA              | 19.20                      | 1              | -                | 3                         | 3                    | 0.00                 | 6.00  |
| 21  | Carbon disulfide                             | 000075-15-8 | 313, IEPA         | 1189.45                    | 3              | -                | 1                         | 2                    | 7.00                 | 10.00 |
| 22  | Carbon tetrachloride                         | 000056-23-3 | 313, IEPA, SEChic | 8.13                       | 3              | PNC              | 0                         | 2                    | 3.75                 | 5.75  |
| 23  | Chlordane                                    | 000057-74-9 | 313               | 0.44                       | 1              | PNC              | 2                         | 3                    | 0.00                 | 13.00 |
| 24  | Chlorinated dibenzodioxins                   |             | IJC               |                            |                |                  |                           |                      |                      |       |
| 25  | Chlorinated dibenzofurans                    |             | IJC               |                            |                |                  |                           |                      |                      |       |
| 26  | Chloroform                                   | 000067-66-3 | 313, IEPA, SEChic | 1.46                       | 1              | PNC              | 3                         | 2                    | 3.00                 |       |
| 27  | Chromium and compounds                       | 007440-47-3 | 313, IEPA, SEChic | 21.43                      | 44             | RNC              | 0                         | 3                    | 3.00                 | 6.00  |
| 28  | Coal tar volatiles                           | 000007-43-2 | IEPA              | 13.39                      | 2              | PNC              | 0                         | 3                    | 0.00                 | 3.00  |
| 29  | Cobalt and compounds                         | 007440-48-4 | 313, IEPA         | 1.04                       | 3              | -                | 0                         | 3                    | 6.00                 | 9.00  |
| 30  | DDT                                          | 000050-29-3 | IJC               |                            |                |                  |                           |                      |                      |       |
| 31  | Di(2-ethylhexyl) phthalate                   | 000117-81-7 | 313               | 2.26                       | 8              | PNC              | 0                         | 2                    | 6.00                 | 8.00  |
| 32  | Dibutyl phthalate                            | 000084-74-2 | 313               | 1.23                       | 6              | -                | 0                         | 2                    | 6.00                 | 8.00  |
| 33  | Dieldrin                                     | 000068-57-1 | IJC               |                            |                |                  |                           |                      |                      |       |
| 34  | Epichlorohydrin                              | 000106-89-8 | 313, IEPA, SEChic | 4.42                       | 3              | PNC              | 2                         | 2                    | 4.50                 | 8.50  |
| 35  | Ethyl acrylate                               | 000148-88-5 | 313, IEPA, SEChic | 4.31                       | 12             | -                | 1                         | 2                    | 3.00                 | 6.00  |
| 36  | Ethylene                                     | 000074-85-1 | 313, IEPA         | 2720.60                    | 14             | -                | 0                         | 1                    | 7.00                 | 8.00  |
| 37  | Ethylene dichloride                          | 000107-06-2 | 313, IEPA         | 16.00                      | 2              | PNC              | 1                         | 2                    | 3.75                 | 6.75  |
| 38  | Ethylene oxide                               | 000075-21-8 | 313, IEPA, SEChic | 175.09                     | 13             | PNC              | 2                         | 3                    | 6.00                 | 11.00 |
| 39  | Formaldehyde                                 | 000050-00-0 | 313, IEPA, SEChic | 67.60                      | 29             | PNC              | 2                         | 3                    | 0.00                 | 5.00  |
| 40  | Hexachlorobenzene                            | 000110-74-1 | IJC               |                            |                |                  |                           |                      |                      |       |
| 41  | Hexachlorocyclopentadiene                    | 000077-47-4 | 313, IEPA         | 0.20                       | 1              | -                | 3                         | 3                    | 7.00                 | 13.00 |
| 42  | Hydrazine                                    | 000102-01-2 | 313               | 0.54                       | 3              | PNC              | 3                         | 3                    | 6.00                 | 12.00 |
| 43  | Hydrogen fluoride                            | 007664-39-3 | 313, IEPA         | 67.02                      | 11             | -                | 2                         | 3                    | 1.50                 | 6.50  |

Appendix P

Option 2 Air Toxics List

| No. | Chemical                         | CAS Number  | Source            | Total<br>Emis.<br>Ton/yr. | Num.<br>Facil. | Cancer<br>Poten. | ----TOXICITY POTENTIAL SCORES---- |                      |                      |       |
|-----|----------------------------------|-------------|-------------------|---------------------------|----------------|------------------|-----------------------------------|----------------------|----------------------|-------|
|     |                                  |             |                   |                           |                |                  | Acute<br>Toxicity                 | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 44  | Isobutyraldehyde                 | 000078-04-2 | 313               | 1.85                      | 1              | -                | 1                                 | 1                    | 4.50                 | 6.50  |
| 45  | Lead and compounds               | 007439-92-1 | 313, IEPA         | 27.54                     | 47             | PHC              | 0                                 | 3                    | 6.00                 | 9.00  |
| 46  | Maleic anhydride                 | 008108-31-6 | 313, IEPA         | 251.00                    | 9              | -                | 2                                 | 3                    | 1.50                 | 6.50  |
| 47  | Mercury                          | 007439-97-6 | IJC, 313, IEPA    | 0.25                      | 1              | -                | 0                                 | 3                    | 6.00                 | 9.00  |
| 48  | Methyl methacrylate              | 000080-62-6 | 313, IEPA         | 9.20                      | 17             | -                | 1                                 | 1                    | 4.50                 | 6.50  |
| 49  | Methylene chloride               | 000075-09-2 | 313, IEPA, SEChic | 1384.50                   | 74             | PHC              | 1                                 | 1                    | 1.75                 | 3.75  |
| 50  | Methylenebis(phenylisocyanate)   | 000101-68-8 | 313, IEPA         | 26.50                     | 12             | -                | 3                                 | 1                    | 2.00                 | 6.00  |
| 51  | Mirex                            | 002385-85-5 | IJC               |                           |                |                  |                                   |                      |                      |       |
| 52  | n-Butyl alcohol                  | 000071-36-3 | 313, IEPA         | 612.19                    | 45             | -                | 1                                 | 1                    | 4.75                 | 6.75  |
| 53  | Nickel and compounds             | 007440-02-0 | 313, IEPA, SEChic | 14.39                     | 29             | KNC              | 0                                 | 3                    | 1.50                 | 4.50  |
| 54  | Nitric acid                      | 007697-37-2 | 313, IEPA         | 89.03                     | 47             | -                | 1                                 | 2                    | 1.50                 | 6.50  |
| 55  | p-Dichlorobenzene                | 008106-46-7 | 313, IEPA         | 398.11                    | 2              | PHC              | 2                                 | 1                    | 1.75                 | 4.75  |
| 56  | Phenol                           | 000108-95-2 | 313, IEPA         | 158.03                    | 24             | -                | 2                                 | 2                    | 6.75                 | 10.75 |
| 57  | Phosphorus                       | 007723-14-0 | 313               | 1.25                      | 2              | -                | 3                                 | 3                    | 3.00                 | 9.00  |
| 58  | Polychlorinated biphenyls (PCBs) | 001336-36-3 | IJC, SEChic       | <0.01                     | 1              |                  |                                   |                      |                      |       |
| 59  | Sulfuric acid                    | 007664-93-9 | 313, IEPA         | 102.70                    | 120            | -                | 2                                 | 3                    | 6.00                 | 11.00 |
| 60  | Tetrachloroethylene              | 000127-18-4 | 313, IEPA, SEChic | 756.94                    | 36             | PHC              | 1                                 | 1                    | 1.50                 | 3.50  |
| 61  | Toluene-2,4-diisocyanate         | 008584-84-9 | 313, IEPA         | 5.00                      | 11             | -                | 3                                 | 3                    | 6.00                 | 12.00 |
| 62  | Toxaphene                        | 008001-35-2 | IJC               |                           |                |                  |                                   |                      |                      |       |
| 63  | Trichloroethylene                | 000079-01-6 | 313, IEPA, SEChic | 1901.00                   | 71             | PHC              | 1                                 | 1                    | 4.50                 | 6.50  |
| 64  | Vinyl chloride                   | 000075-01-4 | 313, IEPA         | 69.14                     | 2              | KBC              | 2                                 | 2                    | 3.50                 | 7.50  |
| 65  | Vinylidene chloride              | 000075-35-4 | 313, IEPA         | 4.35                      | 1              | -                | 1                                 | 2                    | 4.50                 | 7.50  |

Notes:

Chemical - Chemical or compound name

CAS Number - Chemical Abstracts Service Number

Source - Source of chemical (SARA 313 Inventory, Illinois EPA Air Toxics Inventory, International Joint Commission List, or Southeast Chicago Inventory)

Total Emissions - Tons per year of chemical emitted in Illinois

Number of facilities - Number of facilities reporting emissions of this chemical under SARA 313 or to IEPA

Cancer Poten. - Cancer potential  
See text for definition of terms

Acute Toxicity - See text for definition of terms

Subacute Toxicity - See text for definition of terms

Systemic Toxicity - See text for definition of terms

Total - See text for definition of terms

Appendix G

Option 3 Air Toxics List

| No. | Chemical                         | CAS Number  | Source            | Total<br>Emis.<br>Ton/yr. | Num.<br>Facil. | Cancer<br>Poten. | ---TOXICITY POTENTIAL SCORES--- |                      |                      |       |
|-----|----------------------------------|-------------|-------------------|---------------------------|----------------|------------------|---------------------------------|----------------------|----------------------|-------|
|     |                                  |             |                   |                           |                |                  | Acute<br>Toxicity               | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 44  | Mirex                            | 002385-85-5 | IJC               |                           |                |                  |                                 |                      |                      |       |
| 45  | n-Butyl alcohol                  | 000071-36-3 | 313, IEPA         | 612.19                    | 45             | -                | 1                               | 1                    | 4.75                 | 6.75  |
| 46  | Nickel and compounds             | 007440-02-8 | 313, IEPA, SEChic | 14.39                     | 29             | KBC              | 0                               | 3                    | 1.50                 | 4.50  |
| 47  | Nitric acid                      | 007697-37-2 | 313, IEPA         | 89.03                     | 47             | -                | 3                               | 2                    | 1.50                 | 6.50  |
| 48  | p-Dichlorobenzene                | 000106-46-7 | 313, IEPA         | 398.11                    | 2              | PHC              | 2                               | 1                    | 1.75                 | 4.75  |
| 49  | Phenol                           | 000108-95-2 | 313, IEPA         | 158.83                    | 24             | -                | 2                               | 2                    | 6.75                 | 10.75 |
| 50  | Polychlorinated biphenyls (PCBs) | 001336-36-3 | IJC, SEChic       | <0.01                     | 1              |                  |                                 |                      |                      |       |
| 51  | Sulfuric acid                    | 007664-93-9 | 313, IEPA         | 182.70                    | 120            | -                | 2                               | 3                    | 6.00                 | 11.00 |
| 52  | Tetrachloroethylene              | 000127-18-4 | 313, IEPA, SEChic | 756.94                    | 36             | PHC              | 1                               | 1                    | 1.50                 | 3.50  |
| 53  | Toluene-2,4-diisocyanate         | 000584-84-9 | 313, IEPA         | 5.08                      | 11             | -                | 3                               | 3                    | 6.00                 | 12.00 |
| 54  | Toxaphene                        | 000081-35-2 | IJC               |                           |                |                  |                                 |                      |                      |       |
| 55  | Trichloroethylene                | 000079-01-6 | 313, IEPA, SEChic | 1901.80                   | 71             | PHC              | 1                               | 1                    | 4.50                 | 6.50  |
| 56  | Vinyl chloride                   | 000075-01-4 | 313, IEPA         | 69.14                     | 2              | KBC              | 2                               | 2                    | 3.50                 | 7.50  |

Notes:

Chemical - Chemical or compound name

CAS Number - Chemical Abstracts Service Number

Source - Source of chemical (SARA 313 Inventory, Illinois EPA Air Toxics Inventory, International Joint Commission List, or Southeast Chicago Inventory)

Total Emissions - Tons per year of chemical emitted in Illinois

Number of facilities - Number of facilities reporting emissions of this chemical under SARA 313 or to IEPA

Cancer Poten. - Cancer potential  
See text for definition of terms

Acute Toxicity - See text for definition of terms

Subacute Toxicity - See text for definition of terms

Systemic Toxicity - See text for definition of terms

Total - See text for definition of terms

MMS, Opt3.rep

SL 064832

Option 3 Air Toxics List

| No. | Chemical                                     | CAS Number  | Source            | Total Emiss.<br>Ton/yr. | Num.<br>Facil. | ---TOXICITY POTENTIAL SCORES--- |                   |                      |                      |       |
|-----|----------------------------------------------|-------------|-------------------|-------------------------|----------------|---------------------------------|-------------------|----------------------|----------------------|-------|
|     |                                              |             |                   |                         |                | Cancer<br>Poten.                | Acute<br>Toxicity | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 1   | 1,2,4-Trimethylbenzene                       | 000095-63-6 | 313               | 362.95                  | 11             | -                               | 1                 | 1                    | 4.50                 | 6.50  |
| 2   | 1,3-Butadiene                                | 000106-99-0 | 313, IEPA         | 73.98                   | 7              | PHC                             | 0                 | 2                    | 3.50                 | 5.50  |
| 3   | 1,4-Dioxene                                  | 000123-91-1 | 313, IEPA         | 6.36                    | 3              | PHC                             | 1                 | 1                    | 3.50                 | 5.50  |
| 4   | 2-Nitrophenol                                | 000088-75-5 | 313               | 13.50                   | 1              | -                               | 2                 | 1                    | 6.00                 | 9.00  |
| 5   | 2-Nitropropane                               | 000079-46-9 | 313, IEPA         | 73.00                   | 1              | PHC                             | 1                 | 2                    | 6.00                 | 9.00  |
| 6   | 4,4'-Methylenebis(N,N-dimethyl) benzeneamine | 000101-61-1 | 313               | 9.89                    | 1              | PHC                             | 0                 | 1                    | 0.00                 | 1.00  |
| 7   | Acrylic acid                                 | 000079-10-7 | 313, IEPA         | 36.78                   | 11             | -                               | 3                 | 2                    | 2.00                 | 7.00  |
| 8   | Acrylonitrile                                | 000107-13-1 | 313, IEPA         | 298.86                  | 6              | PHC                             | 2                 | 3                    | 7.00                 | 12.00 |
| 9   | Alkylated lead compounds                     |             | IJC               |                         |                |                                 |                   |                      |                      |       |
| 10  | Aniline                                      | 000062-53-3 | 313, IEPA         | 28.26                   | 3              | -                               | 2                 | 2                    | 5.25                 | 9.25  |
| 11  | Arsenic and compounds                        | 007440-38-2 | 313, IEPA, SEChic | 1.25                    | 4              | KHC                             | 0                 | 3                    | 3.00                 | 6.00  |
| 12  | Asbestos (friable)                           | 001332-21-4 | 313               | 0.88                    | 2              | KHC                             | 0                 | 3                    | 1.50                 | 4.50  |
| 13  | Benzene                                      | 000071-43-2 | 313, IEPA, SEChic | 676.37                  | 21             | KHC                             | 0                 | 2                    | 6.00                 | 8.00  |
| 14  | Benzo(a)pyrene                               | 000050-32-8 | IJC               |                         |                |                                 |                   |                      |                      |       |
| 15  | Biphenyl                                     | 000092-52-4 | 313, IEPA         | 4.01                    | 7              | -                               | 1                 | 3                    | 6.75                 | 10.75 |
| 16  | Boron trifluoride                            | 007637-07-2 | IEPA              | <0.01                   | 1              | -                               | 2                 | 3                    | 6.00                 | 11.00 |
| 17  | Cadmium and compounds                        | 007440-43-9 | 313, IEPA, SEChic | 1.63                    | 5              | PHC                             | 3                 | 3                    | 5.00                 | 11.00 |
| 18  | Caprolactam                                  | 000105-60-2 | IEPA              | 19.20                   | 1              | -                               | 3                 | 3                    | 0.00                 | 6.00  |
| 19  | Carbon disulfide                             | 000075-15-0 | 313, IEPA         | 1185.45                 | 3              | -                               | 1                 | 2                    | 7.00                 | 10.00 |
| 20  | Carbon tetrachloride                         | 000056-23-5 | 313, IEPA, SEChic | 0.12                    | 3              | PHC                             | 0                 | 2                    | 3.75                 | 5.75  |
| 21  | Chlordane                                    | 000057-74-9 | 313               | 0.44                    | 1              | PHC                             | 2                 | 3                    | 8.00                 | 13.00 |
| 22  | Chlorinated dibenzodioxins                   |             | IJC               |                         |                |                                 |                   |                      |                      |       |
| 23  | Chlorinated dibenzofurans                    |             | IJC               |                         |                |                                 |                   |                      |                      |       |
| 24  | Chloroform                                   | 000067-66-3 | 313, IEPA, SEChic | 1.46                    | 1              | PHC                             | 3                 | 2                    | 3.00                 | 8.00  |
| 25  | Chromium and compounds                       | 007440-47-3 | 313, IEPA, SEChic | 21.45                   | 44             | KHC                             | 0                 | 3                    | 3.00                 | 8.00  |
| 26  | Coal tar volatiles                           | 008007-45-2 | IEPA              | 13.39                   | 2              | KHC                             | 0                 | 3                    | 0.00                 | 3.00  |
| 27  | DDT                                          | 000050-29-3 | IJC               |                         |                |                                 |                   |                      |                      |       |
| 28  | Di(2-ethylhexyl) phthalate                   | 000117-81-7 | 313               | 2.26                    | 8              | PHC                             | 0                 | 2                    | 6.00                 | 8.00  |
| 29  | Dieldrin                                     | 000060-57-1 | IJC               |                         |                |                                 |                   |                      |                      |       |
| 30  | Epichlorohydrin                              | 000106-89-8 | 313, IEPA, SEChic | 4.42                    | 3              | PHC                             | 2                 | 2                    | 4.50                 | 8.50  |
| 31  | Ethylene                                     | 000074-85-1 | 313, IEPA         | 2728.60                 | 14             | -                               | 0                 | 1                    | 7.00                 | 8.00  |
| 32  | Ethylene dichloride                          | 000107-06-2 | 313, IEPA         | 16.00                   | 2              | PHC                             | 1                 | 2                    | 3.75                 | 6.75  |
| 33  | Ethylene oxide                               | 000075-21-8 | 313, IEPA, SEChic | 175.09                  | 13             | PHC                             | 2                 | 3                    | 6.00                 | 11.00 |
| 34  | Formaldehyde                                 | 000050-00-0 | 313, IEPA, SEChic | 67.68                   | 29             | PHC                             | 2                 | 3                    | 0.00                 | 5.00  |
| 35  | Hexachlorobenzene                            | 000118-74-1 | IJC               |                         |                |                                 |                   |                      |                      |       |
| 36  | Hexachlorocyclopentadiene                    | 000077-47-4 | 313, IEPA         | 0.28                    | 1              | -                               | 3                 | 3                    | 7.00                 | 13.00 |
| 37  | Hydrazine                                    | 000302-01-2 | 313               | 0.54                    | 3              | PHC                             | 3                 | 3                    | 6.00                 | 12.00 |
| 38  | Hydrogen fluoride                            | 007664-39-1 | 313, IEPA         | 67.02                   | 11             | -                               | 2                 | 1                    | 1.50                 | 6.50  |
| 39  | Iodine and compounds                         | 007439-72-1 | 313, IEPA         | 27.54                   | 47             | PHC                             | 0                 | 3                    | 6.00                 | 9.00  |
| 40  | Maleic anhydride                             | 000108-31-6 | 313, IEPA         | 251.88                  | 9              | -                               | 2                 | 3                    | 1.50                 | 6.50  |
| 41  | Mercury                                      | 007439-97-6 | IJC, 313, IEPA    | 0.25                    | 1              | -                               | 0                 | 3                    | 6.00                 | 9.00  |
| 42  | Methylene chloride                           | 000071-09-2 | 313, IEPA, SEChic | 1384.50                 | 74             | PHC                             | 1                 | 1                    | 1.75                 | 3.75  |
| 43  | Methylenebis(phenylisocyanate)               | 000101-68-8 | 313, IEPA         | 26.58                   | 12             | -                               | 3                 | 1                    | 2.00                 | 6.00  |

Appendix B

OPTION 4 AIR TOXICS LIST

| No. | Chemical       | CAS Number  | Source            | Total<br>Emis.<br>Ton/yr. | Num.<br>Facil. | Cancer<br>Poten. | -----TOXICITY POTENTIAL SCORES----- |                      |                      |       |
|-----|----------------|-------------|-------------------|---------------------------|----------------|------------------|-------------------------------------|----------------------|----------------------|-------|
|     |                |             |                   |                           |                |                  | Acute<br>Toxicity                   | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 44  | Toluene        | 000001-35-2 | IJC               |                           |                |                  |                                     |                      |                      |       |
| 45  | Trichloro-     | 000079-01-6 | 313, IEPA, SEChic | 1901.00                   | 71             | PHC              | 1                                   | 1                    | 4.50                 | 6.50  |
| 46  | Vinyl chloride | 000075-01-4 | 313, IEPA         | 69.14                     | 2              | KVC              | 2                                   | 2                    | 3.50                 | 7.50  |

Notes:

Chemical - Chemical or compound name

CAS Number - Chemical Abstracts Service Number

Source - Source of chemical (SARA 313 Inventory, Illinois EPA Air Toxics Inventory, International Joint Commission List, or Southeast Chicago Inventory)

Total Emissions - Tons per year of chemical emitted in Illinois

Number of facilities - Number of facilities reporting emissions of this chemical under SARA 313 or to IEPA

Cancer Poten. - Cancer potential  
See text for definition of terms

Acute Toxicity - See text for definition of terms

Subacute Toxicity - See text for definition of terms

Systemic Toxicity - See text for definition of terms

Total - See text for definition of terms

MSB, Opt4.rsp

OPTION 4 AIR TOXIC LIST

| No. | Chemical                            | CAS Number  | SOURCE            | Total<br>Sales,<br>Ton/yr. | Num.<br>Facil. | Cancer<br>Poten. | ---TOXICITY POTENTIAL SCORES--- |                      |                      |       |
|-----|-------------------------------------|-------------|-------------------|----------------------------|----------------|------------------|---------------------------------|----------------------|----------------------|-------|
|     |                                     |             |                   |                            |                |                  | Acute<br>Toxicity               | Subacute<br>Toxicity | Systemic<br>Toxicity | Total |
| 1   | 1,2,4-Trimethylbenzene              | 000095-63-6 | 313               | 362.95                     | 11             | -                | 1                               | 1                    | 4.50                 | 6.50  |
| 2   | 1,3-Butadiene                       | 000106-99-0 | 313, IEPA         | 73.90                      | 7              | PNC              | 0                               | 2                    | 3.50                 | 5.50  |
| 3   | 2-Nitrophenol                       | 000060-75-5 | 313               | 13.50                      | 1              | -                | 2                               | 1                    | 0.00                 | 9.00  |
| 4   | 2-Nitropropane                      | 000079-46-9 | 313, IEPA         | 73.00                      | 1              | PNC              | 1                               | 2                    | 6.00                 | 9.00  |
| 5   | Acrylonitrile                       | 000079-10-7 | 313, IEPA         | 36.70                      | 11             | -                | 3                               | 2                    | 2.00                 | 7.00  |
| 6   | Acrylonitrile                       | 000107-13-1 | 313, IEPA         | 290.06                     | 6              | PNC              | 2                               | 3                    | 7.00                 | 12.00 |
| 7   | Alkylated lead compounds            |             | IJC               |                            |                |                  |                                 |                      |                      |       |
| 8   | Aniline                             | 000062-53-3 | 313, IEPA         | 20.26                      | 3              | -                | 2                               | 2                    | 5.25                 | 9.25  |
| 9   | Arsenic and compounds               | 007440-38-2 | 313, IEPA, SEChic | 1.25                       | 4              | KNC              | 0                               | 3                    | 3.00                 | 6.00  |
| 10  | Asbestos (friable)                  | 001332-21-4 | 313               | 0.00                       | 2              | KNC              | 0                               | 3                    | 1.50                 | 4.50  |
| 11  | Benzene                             | 000071-43-2 | 313, IEPA, SEChic | 676.37                     | 21             | KNC              | 0                               | 2                    | 6.00                 | 8.00  |
| 12  | Benzo(a)pyrene                      | 000050-32-0 | IJC               |                            |                |                  |                                 |                      |                      |       |
| 13  | Biphenyl                            | 000092-52-4 | 313, IEPA         | 4.01                       | 7              | -                | 1                               | 3                    | 0.75                 | 10.75 |
| 14  | Cadmium and compounds               | 007440-43-9 | 313, IEPA, SEChic | 1.63                       | 5              | PNC              | 3                               | 3                    | 5.00                 | 11.00 |
| 15  | Caprolactam                         | 000105-60-2 | IEPA              | 19.20                      | 1              | -                | 3                               | 3                    | 0.00                 | 6.00  |
| 16  | Carbon disulfide                    | 000075-15-0 | 313, IEPA         | 1103.45                    | 3              | -                | 1                               | 2                    | 7.00                 | 10.00 |
| 17  | Chlorinated dibenzodioxins          |             | IJC               |                            |                |                  |                                 |                      |                      |       |
| 18  | Chlorinated dibenzofurans           |             | IJC               |                            |                |                  |                                 |                      |                      |       |
| 19  | Chromium and compounds              | 007440-47-3 | 313, IEPA, SEChic | 21.45                      | 46             | KNC              | 0                               | 3                    | 5.00                 | 8.00  |
| 20  | Coal tar volatiles                  | 000007-45-2 | IEPA              | 13.39                      | 2              | KNC              | 0                               | 3                    | 0.00                 | 3.00  |
| 21  | DOT                                 | 000050-29-3 | IJC               |                            |                |                  |                                 |                      |                      |       |
| 22  | Dieldrin                            | 000060-37-1 | IJC               |                            |                |                  |                                 |                      |                      |       |
| 23  | Ethylene                            | 000074-85-1 | 313, IEPA         | 2720.60                    | 14             | -                | 0                               | 1                    | 7.00                 | 8.00  |
| 24  | Ethylene dichloride                 | 000107-06-2 | 313, IEPA         | 16.00                      | 2              | PNC              | 1                               | 2                    | 3.75                 | 6.75  |
| 25  | Ethylene oxide                      | 000075-21-8 | 313, IEPA, SEChic | 175.09                     | 13             | PNC              | 2                               | 3                    | 6.00                 | 11.00 |
| 26  | Formaldehyde                        | 000050-00-0 | 313, IEPA, SEChic | 67.60                      | 29             | PNC              | 2                               | 3                    | 0.00                 | 5.00  |
| 27  | Hexachlorobenzene                   | 000110-74-1 | IJC               |                            |                |                  |                                 |                      |                      |       |
| 28  | Hydrogen fluoride                   | 007664-39-3 | 313, IEPA         | 67.02                      | 11             | -                | 2                               | 3                    | 1.50                 | 6.50  |
| 29  | Lead and compounds                  | 007439-92-1 | 313, IEPA         | 27.54                      | 47             | PNC              | 0                               | 3                    | 6.00                 | 9.00  |
| 30  | Maleic anhydride                    | 000100-31-6 | 313, IEPA         | 251.00                     | 9              | -                | 2                               | 3                    | 1.50                 | 6.50  |
| 31  | Mercury                             | 007439-97-6 | IJC, 313, IEPA    | 0.25                       | 1              | -                | 0                               | 3                    | 6.00                 | 9.00  |
| 32  | Methylene chloride                  | 000075-09-2 | 313, IEPA, SEChic | 1304.50                    | 74             | PNC              | 1                               | 1                    | 1.75                 | 3.75  |
| 33  | Methylisocyanate (phenylisocyanate) | 000101-68-0 | 313, IEPA         | 26.50                      | 12             | -                | 3                               | 1                    | 2.00                 | 6.00  |
| 34  | Nitric                              | 002305-85-5 | IJC               |                            |                |                  |                                 |                      |                      |       |
| 35  | n-Butyl alcohol                     | 000071-36-3 | 313, IEPA         | 612.19                     | 45             | -                | 1                               | 1                    | 4.75                 | 6.75  |
| 36  | Nickel and compounds                | 007440-02-0 | 313, IEPA, SEChic | 14.39                      | 29             | KNC              | 0                               | 3                    | 1.50                 | 4.50  |
| 37  | Nitric acid                         | 007697-37-2 | 313, IEPA         | 89.03                      | 47             | -                | 3                               | 2                    | 1.50                 | 6.50  |
| 38  | p-Dichlorobenzene                   | 000106-46-7 | 313, IEPA         | 390.11                     | 2              | PNC              | 2                               | 1                    | 1.75                 | 4.75  |
| 39  | Phenol                              | 000100-95-2 | 313, IEPA         | 150.03                     | 24             | -                | 2                               | 2                    | 6.75                 | 10.75 |
| 40  | Polychlorinated biphenyls (PCBs)    | 001336-36-3 | IJC, SEChic       | <0.01                      | 1              |                  |                                 |                      |                      |       |
| 41  | Sulfuric acid                       | 007664-93-9 | 313, IEPA         | 102.70                     | 120            | -                | 2                               | 3                    | 6.00                 | 11.00 |
| 42  | Tetrachloroethylene                 | 000127-10-4 | 313, IEPA, SEChic | 756.94                     | 36             | PNC              | 1                               | 1                    | 1.50                 | 3.50  |
| 43  | Toluene-2,4-diisocyanate            | 000504-84-9 | 313, IEPA         | 5.00                       | 11             | -                | 3                               | 3                    | 6.00                 | 12.00 |

Cancer Potential - None of the four sources referenced in the Cancer Potential Section identify 1,1,1-Trichloroethane as a carcinogen. It is ranked by USEPA as a Class D chemical, which signifies inadequate evidence of carcinogenicity in laboratory animals.

Toxicity Potential - One animal study using 1,1,1-Trichloroethane resulted in some micropathologic changes in the liver and lungs when the animals were exposed to vapors containing 1,000 ppm. This data results in a systemic toxicity score of 3.0. The toxicity potential score is as follows:

|                         |            |
|-------------------------|------------|
| Acute Lethality Score   | 0          |
| Subacute Toxicity Score | 0          |
| Systemic Toxicity Score | <u>3.0</u> |

Total Toxicity Potential Score 4.0

Hydrochloric Acid - CAS # 7647-01-0

This chemical is a potent pulmonary irritant and according to the SARA 313 1987 data, 932.7 tons per year are emitted in Illinois.

Cancer Potential -- Hydrochloric Acid is not considered to be a carcinogen by any of the four sources referenced in the Cancer Potential Section.

Toxicity Potential -- Some authorities attribute no chronic effects to exposure to Hydrochloric Acid. However, there is evidence that the inhalation of Hydrochloric Acid can increase the susceptibility of some individuals to pulmonary infections. These data result in a systemic toxicity score of 1.5. The toxicity potential score is as follows:

|                         |            |
|-------------------------|------------|
| Acute Lethality Score   | 2.0        |
| Subacute Toxicity Score | 2.0        |
| Systemic Toxicity Score | <u>1.5</u> |

Total Toxicity Potential Score 5.5

Hydrogen Cyanide - CAS # 74-90-8

This chemical is a potent poison in high concentrations and according to the SARA 313 1987 data 1.2 tons per year are emitted in Illinois.

Cancer Potential -- Hydrogen Cyanide is not considered to be a carcinogen by any of the four sources referenced in the Cancer Potential Section.

Toxicity Potential -- Hydrogen Cyanide is not generally regarded as having chronic effects. Although, there is some evidence that Hydrogen Cyanide may produce subjective symptoms, such as weakness or fatigue, at low levels of exposure. These data result in a systemic toxicity score of 1.0. The toxicity potential score is as follows:

|                         |            |
|-------------------------|------------|
| Acute Lethality Score   | 2.0        |
| Subacute Toxicity Score | 2.0        |
| Systemic Toxicity Score | <u>1.0</u> |

Total Toxicity Potential Score 5.0

As the listing process progresses, other such chemicals may be discovered. IEPA is interested in comments regarding how to consider and identify such chemicals.

APPENDIX J  
USEPA LIST OF 37 SUBSTANCES

1. Acetaldehyde
2. Acrolein
3. Acrylonitrile
4. Allyl chloride
5. Benzyl chloride
6. Beryllium
7. Cadmium
8. Carbon tetrachloride
9. Chlorobenzenes
10. Chloroform
11. Chloroprene
12. Coke oven emissions
13. O-, M-, P- Cresol
14. P-Dichlorobenzene
15. Dimethyl nitrosamine
16. Dioxin
17. Epichlorohydrin
18. Ethylene dichloride
19. Ethylene oxide
20. Formaldehyde
21. Hexachlorocyclopentadiene
22. Maleic anhydride
23. Manganese
24. Menthyl chloroform
25. Methylene chloride
26. Nickel
27. Nitrobenzene
28. Nitrosomorpholine
29. Perchloroethylene
30. Phenol
31. Phosgene
32. PCB
33. Propylene oxide
34. Toluene
35. Trichloroethylene
35. Vinylidene chloride
37. O-, M-, P-, Xylene

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