CITY OF PARK RIDGE, ILLINOIS

PRELIMINARY STUDY AND ANALYSIS
OF
TOXIC AIR POLLUTANT EMISSIONS
FROM O'HARE INTERNATIONAL AIRPORT
AND THE RESULTING HEALTH RISKS
CREATED BY THESE TOXIC EMISSIONS
IN SURROUNDING RESIDENTIAL COMMUNITIES

AUGUST 2000

VOLUME I
EXECUTIVE SUMMARY AND BACKGROUND

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Introduction

> "Hazardous air pollutants can cause many health effects. More than half are known or suspected to be human carcinogens. Many are known to have respiratory, neurological, immune or reproductive effects, particularly for more susceptible or sensitive populations, such as children."
>
> USEPA 1999 [1]

The issue of "toxic" [2] air pollution generated by operations at O'Hare Airport has been the subject of widespread concern and public discussion over the last several years. Yet little has been done by either the state (Illinois EPA) or federal (USEPA) governments to evaluate either the amounts of toxic pollutants being generated by O'Hare or to assess the health risk imposed on surrounding residential communities by these emissions.

In response to this lack of action, the City of Park Ridge, Illinois — with financial assistance from the communities of Des Plaines, Niles, and Itasca — commissioned a multi-faceted study of air toxic emissions from O'Hare. Park Ridge retained two prominent, well-respected firms with expertise in air pollution sampling and toxic health risk assessment — Mostardi-Platt Associates and Environ Corporation — to conduct the study.

The purposes of the study included: 1) a preliminary confirmation (on a limited "snapshot" basis), if possible, as to whether toxic emissions from O'Hare operations were actually crossing the fence line at O'Hare, 2) a preliminary health risk assessment of the health risks in surrounding residential communities caused solely by toxic emissions from O'Hare (and using a City of Chicago publication as the source of toxic emission data); and 3) a health risk assessment of the fenceline concentrations in the snapshot study.

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1 *National Air Toxics Program: The Integrated Urban Strategy,* 64 Federal Register 38706 at 38707 (July 19, 1999)

2 The terms "toxic" and "hazardous" are often used interchangeably in this field.

This Report is organized into four volumes:

Volume I	Background and Executive Summary of the Study
Volume II	*Preliminary Modeling Evaluation Of Risks Associated With Emissions From Chicago O'Hare Airport* by Environ Corporation. This study generates a preliminary assessment of the geographic extent and severity of the health risk in surrounding residential communities caused by toxic emissions from O'Hare Airport. This study uses only data generated by the City of Chicago as to the types and quantities of toxic air pollutants expressly acknowledged by Chicago as coming from O'Hare. Had data from other sources been used, the geographic extent of the health risk and the degree of health risk could have been greater.
Volume III	*Preliminary Downwind Site Sampling Investigation For Air Toxic Emissions From O'Hare International Airport* by Mostardi-Platt Associates, Inc. This study contains data on measured toxic emissions crossing the fenceline downwind of O'Hare in a series of "snapshot" sampling events.
Volume IV	*Preliminary Risk Evaluation Of Mostardi-Platt Park Ridge Project Data Monitoring Adjacent To O'Hare Airport* by Environ Corporation. This study generates a preliminary health risk assessment of the toxic compounds measured by Mostardi-Platt in their "snapshot" downwind sampling at the fenceline.

Executive Summary

1. Environ's *Preliminary Modeling Evaluation Of Risks Associated With Emissions From Chicago O'Hare Airport.*

- This study used the O'Hare toxic emission data generated by Chicago in a 1999 report by Chicago's consultant, KM Chng Environmental, Inc. *Findings regarding aircraft emissions, O'Hare International Airport and surrounding communities.* (December 1999)

- The study intentionally used Chicago's own data even though data from other sources suggested that the Chicago/KM Chng data actually understated both the quantity and the types of toxic pollutants generated by O'Hare.

- The study used the Chicago/KM Chng data on O'Hare toxics emissions to perform a standardized transport and dispersion modeling analysis (using standard USEPA models) to determine where the toxic emissions from O'Hare traveled and what health risks were imposed by O'Hare emissions alone in residential communities impacted by O'Hare operations.

- Based on that transport and dispersion analysis (again using Chicago/ KM Chng source data for O'Hare toxic emissions) Environ identified the health risks caused solely by O'Hare toxic emissions in residential communities impacted by O'Hare operations.

- Consistent with EPA policy on assessing the health risk created by major sources of toxic emissions, the study focused on the health risks generated by O'Hare emissions (as stated by Chicago/KM Chng) and did not include either background concentrations or toxic contributions from other sources. Had these other sources been included, the health risk at any given location would likely have been even higher. EPA has announced in its *Urban Toxics Strategy* and its report to Congress on *Residual Risk* that the health risk created by individual major toxic emissions sources should be evaluated without reference to background or other sources.

- The Environ study (again using O'Hare toxic emissions as stated by Chicago/KM Chng) shows that O'Hare air toxic emissions alone cause cancer risks to exceed the federal health goal of 1 cancer in 1,000,000 in 98 Chicago area communities including the City of Chicago — covering an area of approximately 1,000 square miles. Attached as Exhibit 1 to this Volume is a list of the communities where O'Hare toxic emissions cause the cancer risk to exceed the federal health goal of 1 in 1,000,000. Also attached as Exhibit 2 is a map showing the geographic extent of the cancer risk contour created by O'Hare.

- The Environ study concluded that the KM Chng/Chicago toxic emission data for O'Hare may substantially understate both the quantity and types of air toxic emissions from O'Hare. As a result, the cancer risk impact assessment and the assessment of non-cancer health risks may understate the actual health risks caused by O'Hare toxic emissions.

- The Environ study concluded that based on the KM Chng/Chicago toxic emission data for O'Hare, the O'Hare emissions would not be expected to cause non-cancer adverse health effects, but again cautioned as to the incomplete nature of the KM Chng/Chicago toxic emission data for O'Hare.

- The Environ study emphasized that the health risk analysis was preliminary and could be refined through additional air monitoring or additional modeling efforts.

2. **Mostardi-Platt's *Preliminary Downwind Site Sampling Investigation For Air Toxic Emissions From O'Hare International Airport.*** The Mostardi-Platt study was a "snapshot" preliminary study to confirm as to whether toxic emissions generated by O'Hare operations were actually crossing the fenceline downwind of O'Hare. Mostardi-Platt's findings include the following:

- Results of particulate analysis suggest that operations at O'Hare International Airport are contributing to the overall burden of respirable dust in the environment downwind from the airport particularly in 2.5 micron particle size and below.

- Aldehydes, which is a family of chemical compounds that includes formaldehyde, which is a suspected carcinogen, were found at increased levels downwind from O'Hare International Airport. Eight aldehyde compounds were identified and all were found to be at increased levels downwind of the airport with formaldehyde having the most dramatic increase over background levels.

- 219 volatile compounds were found in this investigation. Volatile compounds are a class of compounds that remain in the gaseous state at ambient temperature. Of the compounds found, 92 were identified, and 78 were found to be at increased levels downwind of O'Hare International Airport. The implication is that these compounds are contributing to the overall air pollution burden for those communities that are located downwind from the airport.

- 24 volatile organic compounds that were found to be present at increased concentrations downwind from O'Hare International Airport were compared to average concentrations of the same compound found at the Jardine monitoring station. For all but two compounds, the concentrations at the fence line of the airport were higher than at the Jardine sampling location.

- The following volatile organic compounds were found at increased levels at the fence line of O'Hare International Airport and were attributed to airport activities:

Propane + Propene	Chloromethane	Isobutane + Acetaldehyde
Butene + IsoButene	Butane	Acetonitrile
Acrolein	Isopentane	Acetone
Isopropanol	Pentane	Methylene Chloride
C_5H_{10} Alkane	Carbon Disulfide	2-Methylpropane
Trichlorotrifluoroethane	Methacrolein	2,3-Dimethylbutane
2-Methylpentane	Butanal	2-Butanone
3-Methylpentane	2-Methyl Furan	2-Methyl-1-Propanol
Methylcyclopentane	2,4-Dimethylpentane	n-Butanol
Benzene	Carbon Tetrachloride	2-Methylhexane
2,3-Dimethylpentane	Pentanal	3-Methylhexane
Trichloroethene	Iso-Octane	n-Heptane
4-Methyl-2-Pentanone	Methylcyclohexane	C_8H_{18} Compounds
Toluene	2-Hexanone	Hexanal
2,4-Dimethyl-3-Pentanone	n-Octane	Unidentified Compounds
Ethylbenzene	m & p-Xylene	Cyclohexanone
Heptanal	Styrene	o-Xylene
Butoxyethanol	n-Nonane	alpha-Pinene
Benzaldehyde+2-Ethylhexane	3-Ethyltoluene	4-Ethyltoluene
1,3,5-Trimethylbenzene	Octanal	1,2,4-Trimethylbenzene
n-Decane	$C_8H_{14}O$ Aldehyde	Acetophenone
$C_{10}H_{14}$ Aromatic	$C_{11}H_{24}$ Alkane	Octamethylcyclotetrasiloxane
Nonanal	n-Undecane	$C_9H_{16}O$ Aldehyde
Naphthalene	n-Dodecane	n-Tridecane

n-Tetradecane

3. Environ's ***Preliminary Risk Evaluation Of Mostardi-Platt Park Ridge Project Data Monitoring Adjacent To O'Hare Airport***. This study generates a preliminary health risk assessment of the toxic compounds measured by Mostardi-Platt in their "snapshot" downwind sampling at the fenceline. Environ's conclusions as to this data are:

- Hypothetical lifetime incremental cancer risks associated with concentrations measured at the Airport fenceline are approximately five-fold higher than the cancer risks associated with "background" air quality in Naperville, Illinois. The lifetime incremental cancer risks for residential scenarios based on fenceline concentrations near Runways 27L and 27R range up to about 1 in 10,000 ($1x10^{-4}$), which is equivalent to about 100 in 1,000, 000 ($100x10^{-6}$).

- The potential for non-cancer health effects posed by concentrations measured at one of the locations along the Airport fenceline is higher than for "background" air quality in Naperville, Illinois. The non-cancer Hazard Index (HI) values calculated for residential scenarios based on concentrations measured at the fenceline range up to approximately 23. According to USEPA (1989), when an HI value is calculated to be greater than 1 "there may be concern for potential health effects." By comparison, the non-cancer HI calculated for "background" air quality in Naperville, Illinois is about 1.

- The chemicals that contribute most significantly to risks at the Airport fenceline are commonly detected in aircraft emissions (*i.e.*, aldehydes, benzene, naphthalene), based on data reported by USEPA (1993).

- Calculated cancer and non-cancer risks immediately west of the Airport in Bensenville are lower than the risks to the east of the airport, but somewhat higher than the risks associated with "background" air quality in Naperville, Illinois.

Background of the Mostardi-Platt and Environ Studies

To understand the structure and findings of the Mostardi-Platt and Environ studies of O'Hare air toxics, it is important to first understand the history and logic of federal and state control of toxic air pollutants.

A. Federal Control of "Criteria" Air Pollutants

Since the passage of the federal Clean Air Act in 1970, much of the attention of the USEPA and the states has focused on so-called "criteria" pollutants. Under the structure of the federal Clean Air Act, Congress mandated that USEPA promulgate "criteria" (or health information) for certain pollutants which the EPA Administrator determines may endanger public health or welfare[3]. Following publication of the criteria, the Congress required the Administrator to promulgate National Ambient Air Quality Standards (NAAQS) for those pollutants for which the Administrator had published criteria[4]. Finally, once National Ambient Air Quality Standards had been established, Congress mandated that the USEPA and the States achieve compliance with these ambient air quality standards with "State Implementation Plans" (SIPs) containing regulatory restrictions designed to achieve these ambient air quality standards. To date since the passage of the Clean Air Act 30 years ago, the Administrator of USEPA has only promulgated "criteria" – and resultant National Ambient Air Quality Standards (NAAQS) for a small number of air pollutants[5].

The NAAQS or Criteria pollutants were and are not the mechanism chosen by Congress to address the health risks caused by "toxic" or "hazardous" pollutants – particularly those pollutants considered to be human carcinogens or pollutants having other toxic impacts such as genetic reproductive harm. That was left to authority given to the USEPA under Sections 112[6] and Section 202[7] of the Clean Air Act.

B. Federal Control of "Hazardous" or "Toxic" Air Pollutants

1. "Hazardous" and "Toxic" used interchangeably.

The federal Clean Air Act uses the term "hazardous" air pollutants while the State of Illinois in its Environmental Protection Act uses the term "toxic" pollutants. It is clear that the federal EPA uses the terms "toxic" and "hazardous" interchangeably[8].

2. The combined "technology based" and health risk based approaches in federal

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3 42 U.S.C. §7408

4 42 U.S.C. §7409

5 Sulfur Dioxide (40 CFR §§ 50.4 and 50.5); Particulate Matter (40 CFR §§ 50.6 and 50.7); Carbon Monoxide (40 CFR §50.9); Ozone (40 CFR §§ 50.9 and 50.10); Nitrogen Dioxide (50 CFR §50.11); and Lead (40 CFR §50.12)

6 42 U.S.C. §7412 (Hazardous Air Pollutants)

7 42 U.S.C. §7521(l) (Mobile source related air toxics)

8 Id, at 38707 n.1

environmental law.

There are two common pollution control strategies found throughout most of the federal environmental laws: 1) so-called “technology-based” controls and 2) so-called ambient environmental quality or health risk based controls.

Technology based controls are those based on engineering judgment of the USEPA as to what technology a given pollution source can use to reduce the discharge or emission of pollutants. Examples are found in the “New Source Performance Standards” (NSPS) of the Clean Air Act[9], Maximum Achievable Control Technology (MACT) for Hazardous Air Pollutant Emission Sources[10], in the emission standards for new motor vehicles[11], and in the technology-based discharge requirements of the Clean Water Act[12]. The basic premise of such technology-based controls is that the federal government will require each source of pollutant emissions to use emission controls based on technical equipment or processes (variously referred to in environmental statutes with such terms as “best” or “best practicable” or “maximum achievable control technology”) that are the best that technology can do to limit pollutant emissions.

But throughout the federal environmental statutes is a recognition that technology based controls might not be sufficient to protect public health or the environment. For example a large sewage treatment plant located on a small creek might meet all applicable technology based limitations but still cause major water quality problems in the creek because of the small size of the creek. Similarly, emissions from a large coke oven or incinerator located in a densely populated urban area may create unacceptable public health risks even though the coke oven or incinerator is using the required technology-based controls.

For these reasons, the Congress and the USEPA have recognized the need for environmental and public health emission restrictions which are *more stringent* than those required under basic technology-based requirements. Thus, the federal environmental statutes contain a number of provisions calling for the imposition of more stringent requirements when it is evident that application of technology based requirements alone will cause violation of an environmental standard or will create an unacceptable health risk. Examples of such requirements are found in the Clean Water Act[13] and in the Clean Air Act[14]. For example, §112(f) of the Clean Air Act expressly provides that the EPA Administrator shall impose emission restrictions more stringent

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9 42 U.S.C. §7411 (Standards of Performance for New Stationary Sources).

10 42 U.S.C. §7412(d).

11 42 U.S.C. §7521.

12 *e.g.,* 42 U.S.C. §1311 (Effluent Limitations) and 42 U.S.C. §1316 (National Standards of performance)

13 Water Related Effluent Limitations (42 U.S.C. §1312) more stringent than the technology based limitations of §1311 where application of the technology based limitations would cause a violation of water quality standards.

14 42 U.S.C. §7412(f)(1) and (2). More stringent emission standards than the technology-based emission limits set under §7412(d) for emission of hazardous air pollutants.

than the MACT (Maximum Achievable Control Technology) emission limits of §112(d) if toxic emissions from a source using the MACT limits create a cancer risk of greater than one in one million.

> If standards promulgated pursuant to subsection (d) [MACT] of this section and applicable to a category or subcategory of sources emitting a pollutant (or pollutants) classified as a known, probable or possible human carcinogen *do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a source in the category or subcategory to less than one in one million*, the Administrator shall promulgate standards under this subsection for such source category.

42 U.S.C. §7412(f)(2)(A) (emphasis added)

The important lesson for the lay person reading this technical and legal jargon is that federal government recognizes that there are situations where the application of even the best pollution control technology may not be sufficient to protect against violation of an environmental standard or against creation of an unacceptable health risk. Under those circumstances, Congress has dictated that more stringent requirements must be imposed.

These more stringent requirements can involve tougher "end-of-the-pipe" technology limits. Alternatively, these more stringent requirements can reflect a recognition that certain uses (or certain levels of activity of those uses) cannot be operated in a particularly sensitive setting – *e.g.*, a sensitive environmental receiving stream or, in the case of air toxics, a densely populated residential environment but could be conducted in a less sensitive or less densely populated setting.

3. The combined technology based and health risk based approach for air toxics.

One cannot understand the federal EPA's current approach to air toxics without understanding the history of air toxics regulation under the Clean Air Act. Two relevant recent EPA publications which recite that history are the *National Air Toxics Program: The Integrated Urban Strategy* 64 FR 38706 (July 19, 1999) (hereafter "*Urban Toxics Strategy*") and *Residual Risk Report To Congress,* EPA-453/R-99-001 (March 1999) (heereafter "*Residual Risk")*

Both of these 1999 EPA publications adopt the logic and reasoning of the EPA's 1989 Federal Register decision[15] regarding the setting of health based restrictions for the toxic air pollutant Benzene and the adoption of that EPA framework by Congress in the 1990 Clean Air Act Amendments:

> "The Agency considers the ample margin of safety concept as introduced in the 1970 CAA Amendments, and as applied in the benzene standard (EPA 1989a), a reasonable

15 54 FR 38044 (September 14, 1989)

> approach to evaluate public health significance and to manage residual risks under CAA section 112. Such an approach is consistent with the Congressional language in section 112(f)(2)…"

Residual Risk at 78

The 1999 *Residual Risk Report* is in turn the USEPA's basis for dealing with health risks across all aspects of the air toxics program:

> The Residual Risk Report to Congress, March 3, 1999, describes our approach on risk assessment methods for use *across the air toxics program*, and our approach for conducting residual risk analyses. (EPA-453-/R-99-001)

64 FR at 38709 n. 9 (emphasis added)

As stated in the EPA's *Urban Toxics Strategy*, the EPA first applies a technology based approach – applying technology based limits to emission sources – and then determines if the technology based limits are sufficient to achieve an acceptable public health risk.

> Our overall approach to reducing air toxics reflects the mandates under the Act to develop technology-based standards and *then subsequently to implement a risk-based program* to ensure the protection of public health and the environment.

Id at 38707

4. Determining whether technology based limits provide sufficient health protection.

The first step in any public health risk based analysis is to determine if the technology-based limitations create a threshold risk of concern in the exposed population. Under §112(f)(2) of the Clean Air Act, the technology based limit is presumptively insufficient if the risk to the maximally exposed individual exceeds one in one million.

> If standards promulgated pursuant to subsection (d) [MACT] of this section and applicable to a category or subcategory of sources emitting a pollutant (or pollutants) classified as a known, probable or possible human carcinogen *do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a source in the category or subcategory to less than one in one million*, the Administrator shall promulgate standards under this subsection for such source category.

42 U.S.C. §7412(f)(2)(A) (emphasis added)

If the application of the technology based limits do not achieve this standard, then the EPA goes beyond the technology-based limits to impose limits that provide acceptable health protection. That additional health risk based process is the two-step process outlined in the 1989 EPA Benzene decision and adopted by EPA in its 1999 *Residual Risk Report* and in its *Urban Toxics Strategy*.

5. The one in ten thousand cancer risk and one in a million cancer risk.

The original 1970 version of the Clean Air Act required the EPA Administrator to establish emission standards for hazardous air pollutants at a level which "provides an ample margin of safety to protect the public from such hazardous air pollutant." §112(b)(1)(B) 1970 Clean Air Act. There was significant litigation over this statutory obligation – stemming in large part from the assumed "non-threshold" nature of most carcinogens, *i.e.*, any level above zero is assumed to create some risk of cancer.

The environmental community – relying on the health based nature of the statutory mandate – argued that the emission limit for non-threshold carcinogens should be set at zero. The USEPA argued that the toxic limits need not be based on health concerns and need only reflect a technology-based approach.

The United States Court of Appeals for the D. C. Circuit held that both positions were wrong. *Natural Resources Defense Council v. U.S. Environmental Protection Agency*, 824 F.2d 1146 (D.C. Cir. 1987). The Court ruled that the EPA could not rely simply on technology based standards but must consider health risks. But the Court emphasized the health based standard need not be set at zero – even for non-threshold carcinogens.

The Court directed the Administrator to engage in a two-step process. First, EPA must establish at what level of health risk exposure to a toxic pollutant will be considered "safe". Second, given the uncertainties of scientific knowledge about cancer risk, the Court said that the EPA could set the emission standard even lower (more stringent) than the level EPA had determined to be "safe" in order to provide an "ample margin" of safety. 824 F.2d at 1165

EPA responded to the D.C. Circuit's decision by proposing the very two step approach directed by the Court. EPA adopted what might be called the 1 in 10,000 and 1 in 1,000,000 rule. In its 1989 regulation to establish emission limits for the hazardous air pollutant, Benzene, EPA stated that:

> In protecting public health with an ample margin of safety under section 112, EPA strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no *higher than approximately 1 in 1 million* and (2) limiting to no higher than approximately 1 in 10 thousand the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years.

54 FR 38044 at 38044-45 September 14, 1989 Final Rule on Benzene Emissions (emphasis added)

EPA selected the risk level of 1 in 10,000 – the upper level of acceptable cancer risk found in EPA statutory programs – as the basic "acceptable" health safety level and then emphasized that EPA would consider more stringent limits under the "ample margin" language, if large numbers of people were exposed to risks exceeding 1 in one million. Again, this two step process reflects a recognition of the fact that a greater level of toxic emissions might be allowed where the emission source was in an unpopulated area, but that more stringent limits – designed to protect a large population to a 1 in 1,000,000 – would be considered if a large number of citizens were exposed to risks greater than 1 in 1,000,000.

> Implementation of these goals is by means of a two-step standard-setting approach, with an analytical first step to determine an "acceptable risk" that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual lifetime risk (MIR) of approximately 1 in 10 thousand. A second step follows in which the actual standard is set at a level that provides "an ample margin of safety" in consideration of all health information, including the number of persons at risk levels higher than approximately 1 in 1 million, as well as other relevant factors including costs and economic impacts, technological feasibility, and other factors relevant to each particular decision.

Id at 38045

> The EPA also considers incidence (the numbers of persons estimated to suffer cancer or other serious health effects as a result of exposure to a pollutant) to be an important measure of the health risk to the exposed population. Incidence measures the extent of health risk to the exposed population as a whole, by providing an estimate of the occurrence of cancer or other serious health effects in the exposed population. The EPA believes that even if the MIR is low, the overall risk may be unacceptable if significant numbers of persons are exposed to a hazardous air pollutant, resulting in a significant estimated incidence.

Id at 38045-46

This same two-step approach identifying both the maximally exposed individual as well as the number of people exposed to a cancer risk greater than 1 in 1,000,000 has been carried forward in the EPA's *Residual Risk Report* and in its *Urban Toxics Strategy.*

> For public health risk management decision-making in the residual risk program, EPA considers the two-step process culminating with an "ample margin of safety"

> determination, as established in the 1989 benzene NESHAP and endorsed by Congress in the 1990 CAA Amendments as a reasonable approach. In the first step, a "safe" or "acceptable risk" level is established considering all health information including risk estimation uncertainty. As stated in the preamble to the rule for benzene, which is a linear carcinogen (i.e., a carcinogen for which cancer risk is believed or assumed to vary linearly with exposure), "an MIR (maximum individual risk) of approximately 1 in 10 thousand should ordinarily be the upper-end of the range of acceptability." *In the second step, an emission standard is set that provides an "ample margin of safety" to protect public health, considering all health information including the number of persons at risk levels higher than approximately 1 in 1 million,* as well as other relevant factors including costs, economic impacts, technological feasibility, and any other relevant factors.

Residual Risk at ES-11 (emphasis added)

Thus to apply the EPA's "residual risk" approach (*i.e.*, an analysis of health based requirements beyond technology based controls) one needs to know not only the health risk imposed on the maximally exposed individual to determine if that exposure risk is higher than 1 in 10,000 but one also needs to know the extent of the area and population exposed to a risk greater than 1 in 1,000,000.

6. The problem of risks from other sources – understating the health risk and the required degree of toxics control.

It is well known that residents in some communities are exposed to more than one source of toxic emissions and that the resultant exposure from multiple sources with a variety of toxic compounds may compound the health risk generated by a single large source of toxic emissions. In a precise and rational world these toxic risks from other sources would be evaluated in conjunction with the toxic emission source under study. If the cumulative effect of multiple sources is to raise the health risk beyond acceptable levels, the level of allowable toxic emissions from any individual source may be much less than if the other multiple sources were not present.

Unfortunately, EPA's current methodology for health risk assessments of toxic emissions does not allow assessment of the cumulative health risks for multiple source analysis. As stated by EPA:

> Background concentrations are defined generally as the levels of contaminants that would be present in the absence of source-related contaminant releases. Background concentrations come from either contaminants that may occur naturally in the environment *or contaminants that are emitted by other (i.e., not the sources being assessed)*

> *anthropogenic sources. Narrowly defined for HAPs and the residual risk program, background concentrations are the levels of HAPs in environmental media that are attributable to natural and anthropogenic sources other than the source(s) under evaluation*. At this date, EPA does not have comprehensive Agency-wide guidance or policies on incorporating background concentrations into risk assessments and risk management decisions. Furthermore, analyses of background concentrations and risks can be extremely data-and resource-intensive. *EPA's general approach in previous risk assessments and risk management decisions has been to assess the incremental risk of a particular source or activity and compare that risk to an acceptable risk criterion.* The residual risk program will continue to use this approach, although background concentrations may be considered in the more refined analyses for some source categories.

Residual Risk at ES-11 (emphasis added)

Obviously EPA's "single source" approach may seriously understate the total health risk of residents in areas where there are multiple sources of toxic emissions. Nevertheless, the City of Park Ridge has followed EPA's practice and has directed its consultants to follow EPA's practice in assessing the health risks presented by O'Hare airport. Had multiple sources been assessed, the areas where the cancer risk exceeded 1 in 1,000,000 or 1 in 10,000 may have been substantially greater in area.

Conclusion

The analyses and results of the Environ and Mostardi-Platt studies demonstrate that O'Hare is a major source of toxic air emissions and that O'Hare's toxic air emissions impose undesirable cancer risks on a vast area of residential communities in the Chicago metropolitan area. While Park Ridge recognizes these analyses and results as preliminary, they confirm what many of our citizens have known for some time — O'Hare is a major toxic air polluter and needs to have its toxic air emissions controlled and reduced to protect public health in our communities. These studies and results lead to the following conclusions:

- Federal and state agencies — in conjunction with the communities whose residents are exposed to increased health risks by O'Hare's toxic emissions — need to undertake a major effort to finally measure, report, assess, and control the toxic air emissions from O'Hare.
- A major permanent and comprehensive monitoring system for air toxics needs to be installed around O'Hare and in impacted communities with participation by the impacted communities.

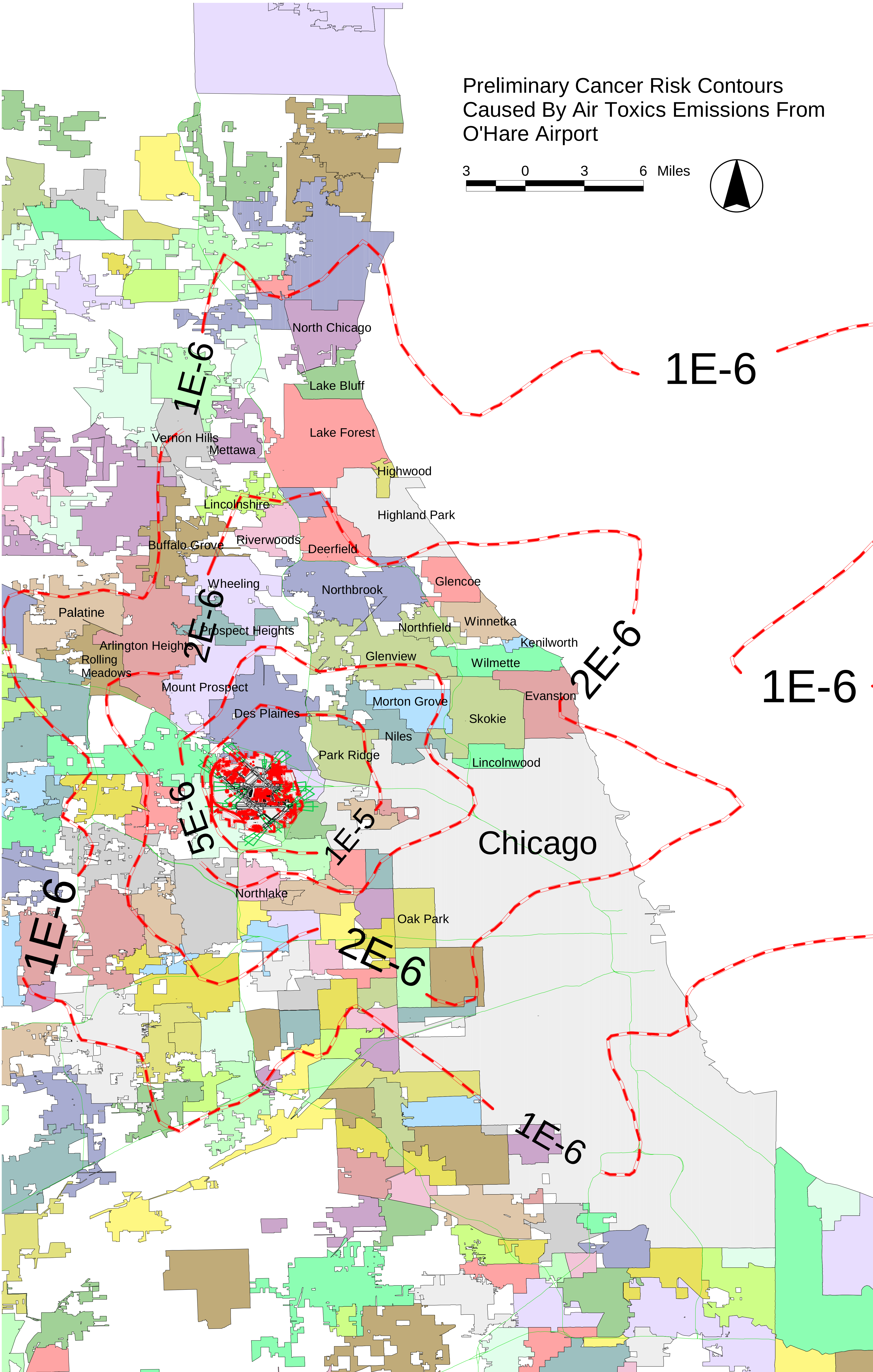
- While public health assessment and potential control measures need to be carefully evaluated and debated one thing is clear. Given the massive and widespread impact of O'Hare's toxic emissions on the health risk of hundreds of thousands of residents in almost 100 metro Chicago communities, O'Hare should not be expanded.

EXHIBIT 1

List of Communities Where Cancer Risk Caused by O'Hare Airport Toxic Air Emissions Exceeds EPA Health Risk Threshold of 1 in 1,000,000

Addison
Arlington Heights
Bannockburn
Bedford Park
Bellwood
Bensenville
Berkely
Berwyn
Broadview
Brookfield
Buffalo Grove
Burbank
Burr Ridge
Chicago
Cicero
Clarendon Hills
Countryside
Darien
Deerfield
Des Plaines
Downers Grove
Elk Grove Village
Elmhurst
Elmwood Park
Evanston
Evergreen Park
Forest Park
Franklin Park
Glen Ellyn
Glenbard South
Glencoe
Glenview
Green Oaks
Gurnee
Harwood Heights
Highland Park
Highwood
Hillside
Hinsdale
Hoffman Estates
Indian Creek
Indian Head Park
Inverness
Itasca
Kenilworth
LaGrange
LaGrange Park
Lake Bluff
Lake Forest
Libertyville
Lincolnshire
Lincolnwood
Lombard
Long Grove
Lyons
Maywood
McCook
Medinah
Melrose Park
Mettawa
Morton Grove
Mount Prospect
Niles
Norridge
North Chicago
North Riverside
Northbrook
Northfield
Northlake
Oak Brook
Oak Brook Terrace
Oak Park
Palatine
Park City
Park Ridge
Prospect Heights
River Forest
River Grove
Riverside
Riverwoods
Rolling Meadows
Rosemont
Schaumburg
Schiller Park
Skokie
Stickney
Vernon Hills
Villa Park
Waukegan
Westchester
Western Springs
Westmont
Wheeling
Willowbrook
Wilmette
Winnetka
Wood Dale
York Center

EXHIBIT 2


Preliminary Cancer Risk Contours
Caused By Air Toxics Emissions From
O'Hare Airport
3 0 3 6 Miles
1E-6
2E-6
5E-6
1E-5
North Chicago
Lake Bluff
Lake Forest
Vernon Hills
Mettawa
Highwood
Highland Park
Lincolnshire
Buffalo Grove
Riverwoods
Deerfield
Wheeling
Glencoe
Northbrook
Palatine
Prospect Heights
Winnetka
Northfield
Arlington Heights
Kenilworth
Rolling
Meadows
Glenview
Wilmette
Mount Prospect
Evanston
Morton Grove
Des Plaines
Skokie
Niles
Park Ridge
Lincolnwood
Chicago
Northlake
Oak Park