Dangerous Air Apparent: How EPA's Hazardous Air Pollutant Program Has Failed to Address Toxic Hotspots

by Rhonda L. Ross and Tammy Asher

Rhonda L. Ross is Assistant Professor of Law, Saginaw Valley State University. Tammy Asher is Associate Professor of Law, Thomas M. Cooley Law School.

Summary

The Clean Air Act (CAA) mandates that EPA regulate emissions of more than 180 commonly used industrial chemicals and compounds known as hazardous air pollutants (HAPs). Unfortunately, EPA does not regulate or restrict emissions of these HAPs based on the health risks posed by ambient-air concentrations or actual exposures to these toxic substances. Instead, EPA has primarily regulated emissions of these HAPs by imposing technology-based emission controls on major sources of these HAPs. Years after those controls are installed, EPA evaluates the health risks that remain, i.e., residual risks, from facilities that emit the HAPs. Even then, EPA does not evaluate these health risks based on actual ambient concentrations of these pollutants—instead, EPA bases its assessment on engineering calculations. EPA's own research indicates that air pollution is posing significant health risks, particularly in urban areas. EPA needs to focus on devising and implementing the programs that were delegated to them under the 1990 CAA Amendments to restrict ambient concentrations of HAPs to levels that will provide adequate protection of public health.

According to the U.S. Environmental Protection Agency (EPA), 430,000 tons of toxic chemicals and compounds were released into the air in 2008.[1] Releases of these toxins continue even though the Clean Air Act (CAA)[2] Amendments of 1990 included specific provisions to abate emissions of hazardous air pollutants (HAPs). Unfortunately, carcinogenic compounds, such as 1,3-Butadiene, ethyl benzene, acetaldehyde, tetrachloroethylene, and 1,4-Dichlorobenzene, are among the tons of HAPs emitted, and those pollutants are posing unacceptable cancer risks of over one in 100,000 people.[3] In addition to cancer risks, other air pollutants are present in the ambient air in quantities and of a duration sufficient to cause or contribute to noncancerous health problems, such as liver or kidney disease, respiratory illnesses, and other serious health risks.[4]

Although EPA estimates that "on average, approximately 1 in every 20,000 people have an increased likelihood of contracting cancer as a result of breathing air toxics from outdoor sources if they were exposed to 2005 emission levels over the course of their lifetime,"[5] EPA does not regulate or restrict emissions of these HAPs based on the health risks posed by ambient air concentrations or actual exposures to these toxic substances.[6] Instead, EPA first regulates emission of HAPs through technology-based standards based on the maximum achievable control technology (MACT) used in practice. Then, EPA handles health effects as "residual risks." However, these residual risks are not even addressed by EPA until at least eight years after EPA promulgates the technology-based standards. Even then, EPA does not appear to be tightening up the technology-based standards to address residual risks based on ambient air quality. Instead, EPA appears merely to be estimating ambient concentrations based on reported engineering calculations of HAP emissions.

EPA does have considerable experience regulating a limited number of air pollutants based on the health risk posed by the pollutant in ambient air. These are known as criteria pollutants and include carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), lead (Pb), particulate matter (PM), and ground-level ozone (O_3).[7] The U.S. Congress granted EPA authority to regulate criteria pollutants

1. U.S. Environmental Protection Agency (EPA), *2010 Toxics Release Inventory National Analysis Overview* (2012), *available at* http://www.epa.gov/tri/tridata/tri10/nationalanalysis/overview/2010TRINAOverview.pdf.
2. 42 U.S.C. §§7401-7671q, ELR Stat. CAA §§101-618.
3. U.S. EPA, *Summary of Results for the 2005 National Scale Assessment* (Feb. 17, 2011), *available at* http://www.epa.gov/ttn/atw/nata2005/05pdf/sum_results.pdf.
4. *Id.*
5. *Id.*
6. *Id.*
7. U.S. EPA, *What Are the Six Common Air Pollutants?*, http://www.epa.gov/air/urbanair/ (last visited Mar. 14, 2012).

under the CAA—specifically under the national ambient air quality standards (NAAQS), where the ambient air quality, and hence the potential for public exposure to such pollutants, drives the stringency under which the emissions of criteria pollutants are regulated. The NAAQS program imposes strict requirements to assure that dirty air areas are cleaned up and that clean air areas are not polluted.[8]

Contrary to the health-based approach under the NAAQS program, the national emission standards for hazardous air pollutants (NESHAPs) program requires EPA to first develop technology-based standards for categories of sources that emit pollutants that Congress listed as HAPs under §112(b) of the CAA.[9] The CAA then requires the Administrator to follow up these technology-based standards for HAPs with risk- or health-based standards eight years later. But there is no mandate that the risk- or health-based standards be based on ambient concentrations of HAPs.[10]

EPA is currently attempting to identify and evaluate the health impact posed by hundreds of sources of HAPs, but under the current program, EPA evaluates the risks posed by individual sources of HAPs and does not focus on the ambient impact of these emissions. Moreover, EPA's current analysis generally does not even involve actual ambient air quality, but is instead based on engineering estimates of HAP emissions by regulated facilities.[11] By neglecting to evaluate the ambient impact of HAPs, EPA's approach allows for "toxic hotspots," which could adversely impact the health of people living in those areas.[12]

I. Framework for Regulating Air Pollution Under the CAA

A. *Criteria Pollutants Are Primarily Regulated Based on Health-Related Ambient Impacts*

Under the CAA, HAPs are regulated differently than traditional, criteria air pollutants. For criteria air pollutants, §108 of the CAA mandates that EPA list the air pollutants that "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare."[13] Under the CAA, standards for regulating criteria air pollutants are clearly and directly related to the health impact of those pollutants in ambient air.[14]

Section 109 then requires EPA to establish NAAQS for the pollutants listed under §108. Specifically, for each listed pollutant, EPA must establish a "primary" NAAQS designed to protect public health with an "adequate margin of safety."[15] There is also a "secondary" NAAQS for each pollutant, which is designed to protect "public welfare."[16] In short, criteria pollutants are regulated under a framework that first establishes an acceptable ambient concentration of a pollutant and then imposes restrictions on emitters of that pollutant to assure that emissions do not make the air dirtier or cause an exceedance of NAAQS.[17]

Companies seeking to construct a facility that will emit a criteria pollutant in an area that is in attainment with NAAQS must install stringent air pollution control technology, known as best available control technology (BACT).[18] In addition, the proposed new emission source cannot emit a quantity of pollutants that will cause the clean air to become dirtier, e.g., cause the ambient air quality to degrade.[19]

Companies constructing a new facility in an area that is not in attainment with NAAQS must install the strictest of air pollution control restrictions, known as lowest achievable emission rate (LAER) technology.[20] And companies locating new sources in nonattainment areas must also get offsets of air pollutants, so that the end result of constructing the new source is that the air quality in the nonattainment area will actually improve.

In addition to the health-based ambient air quality restrictions imposed under the NAAQS program, the CAA also imposes technology-based standards on new and existing sources of criteria air pollutants. Major new and modified sources of criteria air pollutants are required to meet the categorical, technology-based standards of performance for new sources under §111 of the CAA.[21] Existing major sources located in nonattainment areas may be

8. Alaska Department of Environmental Conservation v. Environmental Protection Agency, 540 U.S. 461, 461, 34 ELR 20012 (2004).
9. 42 U.S.C. §7412; *see also* Sierra Club v. Whitman, 353 F.3d 976, 979, 34 ELR 20014 (D.C. Cir. 2004).
10. 42 U.S.C. §7412(f); *see also Whitman*, 353 F.3d at 980.
11. National Emission Standards for Hazardous Air Pollutants: Primary Lead Smelting, 76 Fed. Reg. 9410, 9415 (Feb. 17, 2011); *see also* National Emission Standards for Shipbuilding and Ship Repair (Surface Coating): National Emission Standards for Wood Furniture Manufacturing Operations, 75 Fed. Reg. 80220 (Dec. 21, 2010).
12. Stephen H. Linder et al., *Cumulative Cancer Risk From Air Pollution in Houston: Disparities in Risk Burden and Social Disadvantage*, 42 Envtl. Sci. & Tech. 4312, 4312-22 (2008).
13. 42 U.S.C. §7408(a)(1)(A) (1990).
14. Whitman v. Am. Trucking Ass'ns et al., 531 U.S. 457, 465. 31 ELR 20512 (2001).
15. 42 U.S.C. §7409(a)(1)(B)(2)(b)(1) ("National primary ambient air quality standards, prescribed, under subsection (a) shall be ambient air quality standards the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health."); *see also* U.S. EPA, Ozone Air Quality Standards, http://www.epa.gov/air/ozonepollution/standards.html (last visited Mar. 19, 2012) (EPA establishes primary standards at a level to "protect public health, including the health of 'sensitive' populations such as asthmatics, children, and the elderly.").
16. 42 U.S.C. §7409(a)(1)(B)(2)(b)(2). *See also* U.S. EPA, *supra* note 15 (EPA establishes secondary standards at a level to "protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.").
17. Alexandra J. Terziev, *PSD: New Regulations and Old Problems*, 5 Harv. Envtl. L. Rev. 131, 132 (1981) ("[I]n each area that meets the air quality standards for a given pollutant, the PSD program allows a limited increase in the atmospheric concentration of that pollutant, called an increment.").
18. United States v. Alabama Power Co., 372 F. Supp. 2d 1283, 1286 (N.D. Ala. 2005); *see also* Nathaniel L. Martin, *The Reform of New Source Review: Toward a More Balanced Approach*, 23 Stan. Envtl. L.J. 351, 356 (2004) (citations omitted).
19. *Alabama Power*, 372 F. Supp. 2d at 1286.
20. *Id.*
21. 42 U.S.C. §7411(b).

required to implement "reasonably achievable control technology" on emissions of regulated pollutants.[22]

In short, the NAAQS program establishes health-based ambient limits of certain air pollutants, and then it requires companies that emit those air pollutants, or their precursors, to obtain permits that impose legally enforceable limits on their emissions, so they do not degrade the air quality.[23] In some situations, companies must actually demonstrate an improvement in air quality.[24] In addition to whatever control technology and emission limitations companies have to install and operate to assure that areas reach or continue attainment, companies building new or expanded sources also have to install and operate technology-based control equipment to further reduce emissions.[25]

B. *HAPs Are Primarily Regulated Through Technology-Based Standards*

1. Major Sources of HAPs Require MACT and Residual Risk Standards

Under the 1990 Amendments, HAPs are primarily regulated through categorical technology-based standards.[26] But health risks are not even considered until eight years after the categorical technology-based standards are promulgated.[27] As noted by the U.S. Court of Appeals for the District of Columbia (D.C.) Circuit:

> Congress established a two-phase approach for setting HAP emission standards under the 1990 Amendments. *During the first phase, EPA must promulgate technology-based emission standards for categories of sources that emit HAPs.* These emission standards are to be *based not on an assessment of the risks posed by HAPs, but instead on the maximum achievable control technology (MACT) for sources in each category.* The standards, at a minimum, must reflect the emissions limitation achieved by the best-performing sources in a particular category . . . . *The idea is to set limits that, as an initial matter, require all sources in a category to at least clean up their emissions to the level that their best performing peers have shown can be achieved.*
>
> *The second phase then returns to a risk-based analysis.* That phase—which occurs within eight years after Section 7412(d) MACT standards are promulgated—*requires EPA to consider whether residual risks remain that warrant more stringent standards than achieved through MACT.* EPA must determine whether such standards are required "*in order to provide an ample margin of safety to protect public health . . . or to prevent . . . an adverse environmental effect.*"[28]

In short, the regulation of HAPs involves a two-step approach: First, impose technology-based standards; and second, evaluate residual risk. Even then, the "residual risk" reviews for NESHAP standards appear to be quite limited in practice. EPA recently admitted that its approach to residual risk determinations does not consider actual emissions or ambient air quality:

> In assessing risks to populations in the vicinity of the facilities in each category, we present estimates of risk associated with HAP emissions from the source category alone (source category risk estimates) and HAP emissions from the entire facility at which the covered source category is located (facility-wide risk estimates). We do not attempt to characterize the risks associated with all HAP emissions impacting the populations living near the sources in these categories.[29]

EPA acknowledges that its approach is inadequate: "exposures attributable to emissions from a source category or facility alone may not indicate the potential for increased risk."[30] EPA goes further and admits that its own science advisory board has advised EPA that its assessments should include "background concentrations and contributions from other sources in the area."[31] So, unlike the NAAQS approach, the regulation of HAPs does not involve an evaluation of the concentrations of various pollutants present in the ambient air or the public health impacts of exposure to such pollutants at such levels for such a duration.

2. Area Sources and the Urban Air Toxics Program

Section 112 of the CAA differentiates between major and non-major sources of HAPs. Major sources are defined as

> any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.[32]

Non-major sources of HAPs are called area sources and are defined by the CAA as "any stationary source of hazardous air pollutants that is not a major source."[33] Although most of the provisions of §112 of the CAA are aimed at regulating emissions of HAPs from major sources, there

22. 42 U.S.C. §7502(c)(1). *See also* William H. Lewis Jr. & Hunter L. Prillaman, *Reasonable Available Control Technology Under the Clean Air Act: Is EPA Following Its Statutory Mandate?*, 16 Harv. Envtl. L. Rev. 343, 345 (1992).
23. John Bachman, *Will the Circle Be Unbroken: A History of the U.S. National Ambient Air Quality Standards*, 57 J. Air & Waste Mgmt. Ass'n 652, 652-97 (June 2007).
24. *Id.* at 652-97.
25. *Id.*
26. 42 U.S.C. §7412(f).
27. 42 U.S.C. §7412(f)(2)(A).
28. Sierra Club v. Envtl. Protection Agency, 353 F.3d 976, 980, 34 ELR 20014 (D.C. Cir. 2004) (emphasis added) (internal citations omitted).
29. National Emission Standards for Hazardous Air Pollutants: Primary Lead Smelting, *supra* note 11.
30. *Id.*
31. *Id.*
32. 42 U.S.C. §7412(a)(1).
33. 42 U.S.C. §7412(a)(2).

are several sections of the CAA that address emissions from the smaller area sources.[34]

Section 112(c)(3) of the CAA requires EPA to list "each category or subcategory of area sources which the Administrator finds presents a threat of adverse effects to human health or the environment (by such sources individually or in the aggregate) warranting regulation."[35]

In addition to the general requirements for area sources, the 1990 CAA also established an Urban Air Toxics Program (UATP) specifically requiring EPA to "achieve a substantial reduction in emissions of hazardous air pollutants from area sources and an equivalent reduction in the public health risks associated with such sources including a reduction of not less than 75 per centum in the incidence of cancer attributable to emissions from such sources."[36] Specifically, the area source program and the UATP required the EPA Administrator to

> list, based on actual or estimated aggregate emissions of a listed pollutant or pollutants, sufficient categories or subcategories of area sources to ensure that area sources representing 90 percent of the area source emissions of the 30 hazardous air pollutants that present the greatest threat to public health in the largest number of urban areas are subject to regulation under this section. Such regulations shall be promulgated not later than 10 years after such date of enactment.[37]

> These area source and UATP requirements were imposed because Congress found emissions of hazardous air pollutants from area sources may individually, or in the aggregate, present significant risks to public health in urban areas. Considering the large number of persons exposed and the risks of carcinogenic and other adverse health effects from hazardous air pollutants, ambient concentrations characteristic of large urban areas should be reduced to levels substantially below those currently experienced.[38]

According to a 2000 EPA report to Congress, EPA has a threefold plan to address urban air toxics.[39] The first phase calls for reducing, "by 75 percent, the incidence of cancer associated with air toxics from both large and small industrial/commercial sources."[40] The second goal is to "substantially reduce non-cancer health risks (e.g., birth defects and reproductive effects) associated with air toxics from small industrial/commercial sources."[41] The third strategy is to "address disproportionate impacts of air toxics hazards across urban areas, such as those in areas known as 'hot spots,' and minority and low-income communities in urban areas."[42]

Unfortunately, EPA has not accomplished any of the three goals listed above. EPA is woefully behind in establishing area source regulations and even further behind in addressing urban air toxics.[43] As discussed below, EPA's own 2005 National Air Toxics Assessment study indicates that there are serious excess cancer risks as well as non-cancer health risks in urban areas.[44]

II. Failure to Regulate HAPs Based on Ambient Air Quality Allows for Toxic Hotspots

A. *EPA Does Not Regulate HAPs Based on Ambient Air Quality Standards*

Unlike criteria air pollutants, HAPs are not regulated based on the health effects of ambient concentrations of HAPs. HAPs are first regulated through categorical, technology-based standards, and then EPA evaluates the residual risks of HAP emissions. There are numerous problems with this approach. First, there is a long delay between the time a pollutant is listed as a HAP and the time the health impacts are evaluated.[45] Second, unlike NAAQS, the health impacts of HAPs are not analyzed based on the ambient concentrations of HAPs. Instead, EPA evaluates the health impacts based solely on the estimates of emissions from a source category or the facility emitting the HAPs.[46] EPA does not even consider the actual (or potential) ambient exposure in determining whether the technology-based NESHAP standard is adequate to protect public health. Moreover, EPA's health-risk analysis of HAPs is not even based on monitored air quality. Instead, EPA's analysis is based on engineering estimates of emissions from regulated source categories or facilities.[47]

EPA has been studying the health effects of the criteria pollutants since the CAA of 1970.[48] As a result of these studies, EPA has "extensive human exposure or epidemiological data on the health effects [of criteria pollutants at] ambient-exposure levels."[49] This information has been used to establish, and subsequently modify, numerous NAAQS standards for various criteria pollutants. In addition to the

34. Arnold W. Reitze & Randy Lowell, *Control of Hazardous Air Pollutants*, 28 B.C. Envtl. Aff. L. Rev. 229 (Winter 2001).
35. 42 U.S.C. §7412(c)(3).
36. 42 U.S.C. §7412(k)(1).
37. 42 U.S.C. §7412(c)(3).
38. 42 U.S.C. §7412(k)(3).
39. U.S. EPA, Office of Air Quality Planning and Standards, *National Air Toxics Program: The Integrated Urban Strategy: Report to Congress*, ES-2 (July 2000), *available at* http://www.epa.gov/ttn/atw/urban/natprpt.pdf.
40. *Id.*
41. *Id.*
42. *Id.*
43. U.S. EPA, Office of the Inspector General, *Key Activities in EPA's Integrated Urban Air Toxics Strategy Remain Unimplemented* (June 23, 2010), *available at* http://www.epa.gov/oig/reports/2010/20100623-10-P-0154.pdf.
44. U.S. EPA, *Summary of Results for the 2005 National Scale Assessment*, *available at* http://www.epa.gov/ttn/atw/nata2005/05pdf/sum_results.pdf.
45. 42 U.S.C. §7412(f)(2)(A).
46. National Emission Standards for Hazardous Air Pollutants: Primary Lead Smelting, *supra* note 11.
47. National Emission Standards for Shipbuilding and Ship Repair, *supra* note 11.
48. Jane C. Caldwell et al., *Evaluating the Health Significance of Hazardous Air Pollutants Using Monitoring Data*, 116 Pub. Health Rep. 32, 32-44 (Feb. 2001).
49. Daniel Axelrad et al., *Meeting Report: Estimating the Benefits of Reducing Hazardous Air Pollutants—Summary of 2009 Workshop and Future Considerations*, 119 Envtl. Health Persp. 125, 125-30 (2011).

health studies, EPA and the state air pollution agencies have an extensive monitoring network dedicated to tracking ambient levels of criteria pollutants.[50]

EPA does not have a similar network of monitoring stations for HAPs. Instead, EPA only conducts select monitoring for various studies and otherwise relies on estimates of emissions from major industrial sources.[51] Moreover, EPA claims to lack adequate data on the health impacts of many of the HAPs at ambient-exposure levels.[52]

For example, in the recent proposed residual risk rulemakings for surface coating operations for ships and wood furniture, EPA indicates that rather than use any ambient air quality monitoring data, the Agency has used engineering calculations of emissions and dispersion models to estimate ambient impacts.[53] This approach is wholly inadequate, because there is no evidence that such estimates of ambient impacts correlate to actual ambient impacts. In fact, it is highly unlikely that such a correlation exists, because the emission calculations are generally based on monthly or annual averages and, thus, do not account for fluctuations in emission rates.[54] Moreover, as noted by EPA in the proposed rulemaking, the engineering calculations of emissions do not include chemicals, such as formaldehyde, or other compounds that are generated "during the curing and gluing of parts."[55]

B. EPA's Own National Air Toxics Assessment Identifies Areas With Excessive Adverse Health Impacts From HAPs

In 1990, the CAA mandated the following requirements: (1) EPA must establish categorical standards for sources of HAPs; and (2) EPA must conduct residual-risk evaluations for sources of HAPS. Despite these mandates, EPA's residual-risk assessment programs claim to have very little data available regarding the human-health impacts of HAPs at ambient concentrations.[56] The lack of data is troubling, because EPA's recent National Air Toxics Assessment (NATA) indicates that there are serious health risks associated with HAPs in numerous areas throughout the United States.[57]

According to EPA, the purpose of NATA is "to identify and prioritize air toxics, emission source type, and locations that are of greatest potential concern in terms of contributing to population risk."[58] The NATA study concludes that "approximately 1 in every 20,000 people have an increased likelihood of contracting cancer as a result of breathing air toxics from outdoor sources if they were exposed to 2005 emission levels over the course of their lifetime."[59] Unfortunately, the NATA study also concludes that 3,100 of 66,000 census tracts across the country had "cancer risks greater than 100 in a million."[60] EPA's map of the 2005 NATA Estimated Tract Level of Total Cancer Risk shows the extent to which cancer risks are greater than one in one million across the country.[61] Vast swaths of the country have cancer risks between 25 and 75 in one million. Urban areas have the highest cancer risks, with some urban areas having cancer risks exceeding 100 in one million.

The level of cancer risk found in the NATA study is directly in conflict with the CAA mandate, which states that after the technology-based standards are specified for the categories of major sources emitting HAPs, EPA must assure that maximum "lifetime excess cancer risks to the individual most exposed . . . [be] less than one in one million."[62]

EPA also assessed non-cancer health risks in the NATA study.[63] Although the CAA establishes a one-in-one-million risk-based standard for carcinogenic HAPs, there is no such guidance for noncarcinogenic HAPs. Also, noncarcinogens are not evaluated based on the probability that exposure at a given concentration, duration, or frequency will cause any particular effect. EPA uses a Hazard Quotient and a Hazard Index (HI) to evaluate noncarcinogenic health effects.[64] An HI higher than 1.0 is deemed to pose an unacceptable risk. EPA's census-tract mappings of estimated respiratory HI illustrate that there are significant portions of the country that appear to exceed the acceptable health-based limits.[65]

The NATA study determined that the chemical acrolein "contributed about 75% of the nationwide average non-cancer hazard."[66] The HI for acrolein "exceeded 1.0 for approximately 69 million people while the HI exceeded

50. Jane C. Caldwell et al., *Evaluating the Health Significance of Hazardous Air Pollutants Using Monitoring Data*, 116 Pub. Health Rep. 32, 32-44 (Feb. 2001).
51. *Id.*; *see also* National Emission Standards for Shipbuilding and Ship Repair, *supra* note 11 ("What data were used in our risk analyses? For the Wood Furniture Manufacturing Operations source category, we compiled preliminary datasets using data in the 2005 NEI."). (Note: NEI means National Emission Inventory, which reflects an engineering estimate of emissions from various sources. It does not represent monitored ambient air.)
52. Axelrad et al., *supra* note 49 ("For most of the air toxics, the available health information is based on animal studies. Therefore, reasoned assumptions about how these data relate to potential human health hazards are needed.").
53. National Emission Standards for Shipbuilding and Ship Repair, *supra* note 11.
54. *Id.*
55. *Id.*
56. Tina Bahadori et al., *Criteria Air Pollutants and Toxic Air Pollutants*, 108 Envtl. Health Persp. 625, 629 (Aug. 2000).
57. U.S. EPA, *2005 National-Scale Air Toxics Assessment*, http://www.epa.gov/ttn/atw/nata2005/ (last visited Mar. 19, 2012) (although the most recent National-Scale Air Toxics Assessment was conducted by EPA in 2005, the results were not released until March 2011, and the results are alarming).
58. *Id.*
59. U.S. EPA, *Summary of Results for the 2005 National Scale Assessment*, *available at* http://www.epa.gov/ttn/atw/nata2005/05pdf/sum_results.pdf.
60. U.S. EPA, *EPA's National-Scale Air Toxics Assessment for 2005: Fact Sheet*, *available at* http://www.epa.gov/ttn/atw/nata2005/05pdf/nata2005_factsheet.pdf.
61. U.S. EPA, *Map of Total Cancer Risk Based on Census Tract (for 2005 NATA Data)*, *available at* http://www.epa.gov/ttn/atw/nata2005/2005nata_cancer_risk_tract_map1.jpg.
62. 42 U.S.C. §7412(f)(2)(A).
63. U.S. EPA, *supra* note 59.
64. *Id.*
65. U.S. EPA, *Estimated Respiratory Hazard Index on a Census Tract Level (based on the 2005 NATA data)*, *available at* http://www.epa.gov/ttn/atw/nata2005/2005nata_repiratory _risk_tract_map1.jpg.
66. *Id.*

10 for more than 174,000 people."[67] In short, more than 69 million people are at risk for adverse respiratory effects due to ambient concentrations of acrolein. Appendix B contains a map of EPA's 2005 NATA. In the NATA study, EPA also concluded that people living in urban areas are subject to greater exposures of both carcinogenic and non-carcinogenic HAPs.[68]

Although that NATA report was produced in 2005, under NESHAPs, EPA has issued numerous residual-risk rulemakings since 2005 without requiring any additional controls beyond the original technology-based standards.[69]

III. Conclusions and Recommendations

HAPs are regulated primarily under categorical, technology-based standards, in contrast to the NAAQS program for criteria pollutants, which is based on the public health and welfare impacts of criteria pollutants in ambient air. Due to the adverse health effects posed by HAPs, EPA should evaluate the risks posed by HAP emissions and revise emission limitations to reflect health-based limits on ambient air quality levels.

Although EPA claims to have considered "cumulative" impacts of exposure to air pollutants, the Agency did not take synergistic impacts into account.[70] In fact, EPA's cumulative impact analysis only considers the aggregate potential impact of pollutants based on the organ system those pollutants target. Individual pollutants may pose adverse health risks, but, sometimes, the combination of air pollutants can pose synergistic health effects that are worse than the sum of the health impacts of the individual air pollutants.[71] People do not live in a laboratory where pollutants and exposures are segregated based on target organ systems. People live in a "toxic soup" of air pollutants where synergistic impacts could be important factors in a risk assessment.

EPA should establish health-based, acceptable ambient concentrations of HAPs. Even if the Agency is unable to establish such standards for all the HAPs at once, it should, at a minimum, prioritize the list of pollutants based on toxicity and likely exposures and set ambient standards for those HAPs first. There is no excuse for failing to conduct such research and obtain such data in the 20-year period since the passage of the 1990 Amendments.

EPA may be able to make use of some of the work of various state agencies. Numerous states have state-based programs that address emissions of air toxics. For example, California enacted the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) in 1987.[72] This state-based program requires companies that emit air toxics to report emissions to the California Air Resources Board. The California Legislature amended the law in 1992 to require companies with emissions that pose "significant risks" to reduce emissions until the risk level falls below the significance threshold. EPA could request that the CAA be modified to allow for a similar approach at the national level.

Moreover, California's program is not the only state-based air toxics program. Other states, including, but not limited to, Maryland, Michigan, New Jersey, North Carolina, and Wisconsin, have air toxics rules that may be more protective of public health than EPA's program.[73] To better protect public health from exposure to hazardous and toxic air contaminants, EPA should, within the scope of its authority under the CAA, review these state-based programs and adopt similar provisions.

It may have been more expedient to start with technology-based standards in 1990 because technology-based standards were probably faster to implement than having to develop health-based standards for hundreds of HAPs as well as emission limits on hundreds of source categories. So, on one hand, developing the technology-based standards first did allow EPA to develop standards more quickly and therefore forced emission reductions more quickly than if they had initially worked on health-based standards.[74] But there is no excuse for EPA failing to have a stronger health risk-based program in place more than 20 years after the CAA Amendments of 1990. The residual risk program is intended to be a health-based program and thus should be based on ambient concentrations of HAPs to assure that such pollutants are not present in quantities, frequencies, or durations that could pose adverse impacts on public health.

Moreover, given the explicit direction by Congress to reduce cancer and non-cancer health impacts from urban air toxics, EPA's failure to implement "key requirements of CAA Section 112(k)," such as to establish "baseline risk data to measure progress in reducing air toxics risks," is inexcusable.[75] Particularly disconcerting is that over 10 years ago, EPA decided that "a risk-based program" was necessary to achieve the goals of the Urban Air Toxics Strategy, but "EPA has not yet determined whether it has the statutory authority to require State and local agencies to implement such a program."[76]

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67. *Id.*
68. *Id.*
69. Source categories for which EPA has conducted residual risk assessments and not required additional controls beyond the original technology-based standards include, but are not limited to, ethylene oxide sterilizers. Ethylene Oxide Emissions Standards for Sterilization Facilities; Final Decision, 71 Fed. Reg. 17712 (Apr. 7, 2006), *see also* National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers, 71 Fed. Reg. 17729 (Apr. 7, 2006); National Emission Standards for Hazardous Air Pollutants for Magnetic Tape; Final Decision, 71 Fed. Reg. 17720 (Apr. 7, 2006).
70. Deborah Behles, *Examining the Air We Breathe: EPA Should Evaluate Cumulative Impacts When It Promulgates National Ambient Air Quality Standards*, 28 Pace Envtl. L. Rev. 200, 216 (2011).
71. *Id.* (citations omitted).
72. California Air Resources Board, *Overview of the Air Toxics "Hot Spots" Information and Assessment Act*, Arb.ca.gov, http://www.arb.ca.gov/ab2588/overview.htm (last visited Mar. 19, 2012).
73. Victor B. Flatt, *Gasping for Breath: The Administrative Flaws of Federal Hazardous Air Pollution Regulation and What We Can Learn From the States*, 34 Ecology L.Q. 107, 173 (2007).
74. Bachman, *supra* note 23.
75. U.S. EPA, *supra* note 43.
76. *Id.*

EPA reports the cancer and non-cancer results differently for the 2005 NATA, thus making it hard to compare the two studies. However, according to EPA, "most individuals' risks" are "between 1 in a million and 100 in a million, although a small number of localized areas show risks to be higher than 100 in a million risk."[77]

EPA also notes that

> in general, we see that larger urban areas tend to carry larger risk burdens than smaller urban and rural areas because the emissions of air toxics tend to be higher in areas with more people. This trend is not universal and can vary from pollutant to pollutant, according to its sources, and may also be affected by exposures and risk from non-inhalation and indoor sources of exposure.

This is a particularly odd declaration by EPA, given that Congress told the Agency that there were unacceptable risk burdens in urban areas back in 1990 when they enacted the CAA Amendments. It was this very risk to urban communities that drove Congress to mandate that EPA implement an Urban Air Toxics Strategy. Instead of spending the past 20 years implementing a strategy to reduce the risk of associated with HAPs, EPA seems to have settled on a strategy of simply restating the obvious.

77. U.S. EPA, *2005 National Scale Air Toxics Assessment: Frequently Asked Questions,* http://www.epa.gov/ttn/atw/nata2005/natafaq.html#B1 (last visited Mar. 19, 2012).