Air Toxics: How Far Has New Jersey Come in Almost a Quarter Century?

STATE OF NEW JERSEY
CLEAN AIR COUNCIL

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***Editor's note**: See supporting documents for this report at:*
https://dep.nj.gov/cleanaircouncil/previous-public-hearings/public-hearing-2023/

EXECUTIVE SUMMARY

The New Jersey Clean Air Council conducted its 2023 public hearing to determine the amount of progress New Jersey has made in almost a quarter century of emission control and regulation of air toxics. The monitoring, regulation, and reduction of air toxics began in earnest with the passage of the 1990 amendments to the Clean Air Act. Since that time, the State of New Jersey, primarily through the NJDEP, but also through other regulatory programs impacting transportation, utilities and public health, have been taking steps to reduce the public health impacts of air toxics.

In 2000, the Clean Air Council held a public hearing on the specific impact of air toxics in New Jersey and provided recommendations to the Commissioner of NJDEP to reduce the impacts of air toxics on New Jersey's citizens.

This year, the Council again focused on the impacts of air toxics, both to identify areas of progress, and also determine whether further efforts are needed to reduce air toxics. The Council analyzed the following issues:

- What were the historic and current sources of air toxics? How has New Jersey's air toxics profile changed?
- What are the health effects and potential exposures to air toxics?
- What does ambient air monitoring and modeling over the past 23 years indicate are the trends for air toxics?
- How should the department identify emerging air contaminants and develop programs to minimize their impact?
- What risk assessment tools and other studies are, or should be, available as technology and science has advanced for use in regulatory determinations?
- What are some creative solutions to reducing air toxics impacts? (Industrial vs. Commercial vs. Consumer)
- Are new regulations needed? Are current rules adequately enforced?
- What are the impacts resulting from the recommendations made in the 2000 Clean Air Council report? Are these recommendations still relevant and what new recommendations should be made?

Based upon the expert testimony received through the April 19, 2023, hearing, the data clearly indicate that levels of air toxics have been reduced in New Jersey since the last hearing report on this topic. The quality of New Jersey's air is better than it was in 2000 and, as presented by the NJDEP, numerous air toxics have decreased. The efforts to control air toxics as point sources and the gradual increase in mobile source regulations have improved the air we breathe. At the same time, it is clear that more can be done to improve air quality and, specifically, exposure to air toxics, in New Jersey. With the recent focus on air quality in overburdened communities, particularly with the passage of the New Jersey Environmental Justice (EJ) Law and NJDEP's promulgation of the Environmental Justice rules, the Council has provided recommendations, detailed below, that emphasize increased air toxics monitoring, particularly in overburdened communities, as well as attempt to build on the significant progress New Jersey has made to reduce the impact of air toxics.

RECOMMENDATIONS

Community Engagement on Air Toxics

- NJDEP needs to establish a community-level stakeholder outreach and communications initiative to engage communities in a dialog on air toxics that are being monitored and solicit input from communities about their concerns related to exposure to those being monitored, as well as those for which a monitoring plan has not been implemented;
- NJDEP should enhance its risk communication capacity, in partnership with other state agencies, academic partners, and media experts in risk communication (e.g., meteorologists), to focus on clear messaging about the health impacts of exposure to various harmful particulate matter (the interaction of a mixture of criteria pollutants, air toxics and meteorology - i.e., humidity and temperature);
- NJDEP should establish an air quality "ambassador" program (similar to the AmeriCorps New Jersey Watershed Ambassador program) to train and educate communities on collecting air samples for particulate matter including pollen and air toxics data collection, and data analysis;
    - The ambassador program would train individuals from different communities in the use of collection devices and proper times and techniques for air sample collection and data analysis,
    - An example of an ambassador program is the Air Quality and Aerobiology (A^2Qua) program which engages young people (middle and high school) in climate change research and education through aerobiology and air quality analysis and assists in the communication of "asthma and allergy" alerts to communities via mobile technology and student directed community service projects. (see additional comments on page 24 of this report from Dr. Bielory regarding the A^2Qua program).

Environmental Justice

- NJDEP should expand air quality monitoring efforts within overburdened communities where environmental stressors, including air pollution, may be disproportionately higher when compared to communities of higher socioeconomic status, and with less traffic and fewer industrial emissions;
    - NJDEP should consider implementing hyper-local (e.g., census tract level) monitoring in overburdened communities around ports and airports through placement of a network of additional air monitors for both particulate matter and air toxics;
    - Given the limitations of low-cost sensors and the high cost of stationary central site monitoring for air toxics, NJDEP should develop and implement a pilot program to evaluate using vehicle-mounted, on-demand, air monitoring platforms to assess "hot-spots" or other concerns about local air toxics impacts throughout the State.
- NJDEP should convene an intra-agency air toxics group consisting of the Division of Air Quality and Radiation Protection, the Division of Science and Research, the Division of Air Enforcement, and the Division of Climate Change Mitigation and Monitoring that

engages with State (e.g., NJDOH, NJDOT), County and Municipal Agencies to provide air toxics information for the purpose of developing policy solutions in New Jersey communities.

Ambient Air Quality Monitoring

- NJDEP needs to expand air quality monitoring (e.g., air toxics, pollutants, pollen) throughout the State to provide more data relating to the general and at-risk populations;
    - Using the information gathered as part of the vehicle-mounted, on-demand, air monitoring platforms pilot program to assess "hot-spots" and other concerns of local air toxics impacts throughout the State, the NJDEP should determine whether the four air toxics monitoring stations should be expanded to provide better state-level coverage.
- NJDEP should consider using less expensive and somewhat less accurate monitoring equipment to identify air toxics areas of concern or potential emissions "hot spots;" (see NJ Clean Air Council 2017 Public Hearing; https://dep.nj.gov/cleanaircouncil/previous-public-hearings/public-hearing-2017/);
    - NJDEP should develop a pilot program to investigate the use of air toxics fence line monitoring to more accurately assess potential exposure to residents living in close proximity to an emissions source – perimeter monitoring should be used for more than site remediation efforts and can be used to objectively address community concerns;
    - NJDEP needs to prioritize which pollutants from community sources should be continuously monitored for potential standard exceedances and how to best communicate risk to the community;
    - Focus for prioritization of air toxics monitoring should be those air toxics that exceed health benchmarks and are emitted from sources within New Jersey;
- NJDEP needs to pilot monitoring of other aerobiological triggers affecting the general and overburdened communities (e.g., black carbon, pollen) as a more sensitive indicator of $PM_{2.5}$ concentrations.
- As air quality data are collected from any of the aforementioned programs, they should be shared with NJDOH, NJDOT, and NJ Dept. of Agriculture to coordinate and inform those state agencies of policies related to air quality and air toxics and promote an interagency discussion on improving public health impacts from air toxics.

Policy, Research, and Standards

- NJDEP should continue to expand, in conjunction with NJDOH, the use of risk-based standards that include both cancer and non-cancer (e.g., respiratory) endpoints when assessing emission exposure risks;
- NJDEP should partner with academic experts through the NJDEP Science Advisory Board to research and develop means to quantify impacts from combined low-level exposures to air toxics that are below health benchmarks;
    - Sociodemographic and EJ issues within a community should be considered when assessing chronic and low-level exposures from emission sources;

- The NJDEP air permitting program should reexamine operating requirements of facilities with underregulated or unregulated emission sources to determine how these emissions impact overburdened communities;
    - NJDEP should develop methodologies to conduct area-specific risk assessments which consider local meteorologic conditions and cumulative pollution (contingent upon availability of air monitoring data).

Source Emissions Monitoring

- NJDEP should expand both fence line and community monitoring in and around waste management facilities and fumigation facilities to better characterize modeled emission impacts and health risks to surrounding communities;
- NJDEP should determine priority of pollutant monitoring for in-state pollutant sources that can be regulated;
    - Of the 181 pollutants included in the 2019 nationwide AirToxScreen, 11 exceeded levels of concern in New Jersey;

2019 AirToxScreen New Jersey Chemicals of Concern		
Pollutant	**Number of Counties Above Health Benchmarks**	**Primary Source Category**
1,3-Butadiene	7	Mobile
4-4' Methylene bis(2-chloroaniline)	1	Point
Acetaldehyde	21	Secondary/Background
Benzene	21	Mobile
Cadmium Compounds	1	Point
Carbon tetrachloride	21	Background
Chromium VI	4	Point
Diesel Particulate Matter	21	Mobile
Ethylene oxide	18	Point
Formaldehyde	21	Secondary/Background
Naphthalene	17	Nonpoint
*Air Toxics in Red text are those that are currently being monitored and have a risk ratio greater than 1		
*Air Toxics in Blue text are not on the list of monitored air pollutants		

    - Chemicals listed in red should continue to be monitored;
    - Chemicals listed in blue should be monitored as new monitoring technology and analytic methods become available;
    - It should also be noted that the chemicals of concern can vary on an annual basis as emission profiles and meteorologic conditions change. Pollutants that were monitored by NJDEP in 2022 and exceeded health benchmarks were: acetaldehyde; acrolein; benzene; 1,3-butadiene; carbon tetrachloride; chloroform; chloromethane; 1,2-dibromomethane; 1,2-dichloroethane; and formaldehyde.

- NJDEP should pilot the potential use of a vehicle-mounted, on-demand, air monitoring platforms for use in acute situations (e.g., local forest fires, community-based sources of air pollution).

BACKGROUND

Air pollutants can be broken down into two classifications, criteria pollutants and air toxics. There are six pollutants for which the U.S. Environmental Protection Agency (USEPA) has set National Ambient Air Quality Standards (NAAQS). These are known as criteria pollutants. They are ozone, sulfur dioxide, carbon monoxide, nitrogen dioxide, particulate matter, and lead. For many years, they have been addressed throughout the country through a standard planning process, and the concentrations of these pollutants in the air have been extensively monitored and tracked for compliance with the air quality standards. The standards are established by the USEPA, and monitoring is carried out by state, local, and tribal governments to determine whether the standards are being met. Any other air pollutants that are not criteria pollutants (except lead, which is both a criteria pollutant and an air toxic), and that may be emitted into the air in quantities that can cause adverse health effects, can be classified as air toxics. These health effects cover a wide range of conditions from lung irritation to birth defects to cancer. There are no NAAQS for these pollutants, but in 1990 the U.S. Congress directed the USEPA to begin to address a list of almost 200 of these air toxics by developing control technology standards. These particular air toxics are known as Hazardous Air Pollutants (HAPs).

The Federal Clean Air Act (CAA) identifies 188 HAPs that USEPA is required to control to protect public health (https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications). More specifically, the CAA directs USEPA to:

> *Identify a subset of 30 HAPs that present the greatest threat to public health in the largest number of urban areas. These 30 HAPs are known as the 30 urban air toxics. Identify area sources that represent 90 percent of the combined emissions of the 30 urban air toxics and subject these sources to regulation.*

Most air toxics originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires.
Air toxics tend to pose greater risks in urban areas because these areas have large populations and a higher concentration of emission sources. Combined exposures from all sources of air pollution, including major stationary sources, smaller area sources, indoor sources, and mobile sources can increase public health risks from air toxics. Low-income neighborhoods, tribal populations, and communities of color that live in urban areas may be disproportionately exposed to air pollution, which is a barrier to healthy outcomes and economic opportunity. People exposed to toxic air pollutants at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory and other health problems. In addition to exposure from breathing air toxics, some toxic air pollutants such as mercury can deposit onto soils or

surface waters, where they are taken up by plants and ingested by animals and are eventually magnified up through the food chain. Like humans, animals may experience health problems if exposed to sufficient quantities of air toxics over time. For a more detailed description of adverse health outcomes related to air toxics, refer to the Health Effects Notebook for Hazardous Air Pollutants (https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants).

During the year 2000, the New Jersey Clean Air Council (CAC or Council) public hearing sought information and suggestions regarding the testing and regulation of air toxics in New Jersey. The hearing encompassed the sources and health effects of air toxics, the risk assessment tools, and monitoring status of these pollutants. The CAC sought to determine if new regulations were needed and if the current rules were adequately enforced. Some of the material presented at the hearing focused upon the 1998 USEPA comprehensive estimates of air toxics in New Jersey. These estimates came from the 1990 Cumulative Exposure Project (CEP) and highlighted the need to address the issue of air toxics in New Jersey by studying sources in the state and developing a plan for reduction of these toxics. The CEP is a useful screening tool to identify the HAPs that need further analysis. However, even with improvements, the uncertainties implicit in the CEP make estimates of ambient HAP concentrations unreliable at the census tract level.

New Jersey currently has a comprehensive air quality program. However, although great progress has been made in cleaning up the air through the regulation of industry and mobile sources, the CEP results indicated that air toxics still pose a threat to human health. The CAC believed that additional efforts needed to be made to reduce the level of air toxics in the atmosphere.

Although the CEP conclusions were of concern, it should be noted that the data used in the modeling studies was, at that time, ten years old and more recent NJDEP data indicated that New Jersey's air toxic inventory had decreased from 150,000 tons in 1990 to 65,000 tons in 1996. The difference between the two New Jersey numbers, a decrease of 56%, demonstrated one reason for needing better, up-to-date values and improved modeling.

Although Toxic Release Inventory (TRI) data are available for many air toxic sources, they are not available for municipal waste incinerators, medical waste incinerators, mobile sources, and non-point sources. These emissions need to be studied and the results of the study provided to the public.

Based upon the testimony received at the 2000 CAC hearing, the Council made the following recommendations to the Commissioner of the New Jersey Department of Environmental Protection (NJDEP).

1. The Council recommends the rapid implementation of Governor Whitman's proposal to expand the air toxics monitoring sites from 1 to 4 and increase the frequency of sampling from every day to every 6 days. This plan was to be fully operational by 2000.
2. The Council strongly supported monitoring of additional contaminants, such as metals, volatiles and semi-volatiles.

3. The Council recommended a series of special monitoring studies in those areas of New Jersey that exceeded health benchmarks in modeling studies. The NJDEP was asked to prioritize areas in reflection of the severity of the exceedances.
4. The Council recommended more validation and verification of the data collected in the state.
5. The Council recommended that the NJDEP be alert to the development of new control technologies, so that they may be adopted where appropriate in New Jersey.
6. The Council recommended that the NJDEP and the USEPA require a sulfur reduction in fuel in order to have cars operating at the maximum levels of pollution control.
7. The Council recommended that the NJDEP continue to investigate the sources of mercury emissions in the state.
8. The Council recommended that the NJDEP continue monitoring the use of MTBE in gasoline and develop a policy in accordance with the findings.
9. The Council supported implementing a statewide public education program regarding the impact of automobiles on air quality in general and air toxics in particular. The program would stress the importance of reducing vehicle miles traveled, the advantage of the use of public transportation, the benefit of the purchase and use of LEVs, ULEVs and ZEVs (respectively, low, ultra-low and zero-emission vehicles), as well as the importance of good vehicle maintenance.
10. The Council supported research into the health effects of indoor air pollutants and the relationship to outdoor air quality and its health effects. It also supported a public education program regarding indoor air toxics and the public's role in curbing them. This program was to be coordinated with local and state health departments.
11. The Council supported full implementation of the enhanced I&M (inspection and maintenance) program for automobiles. (N.J.A.C.7:27-15)
12. The Council encouraged cooperation between the NJDEP and county and local agencies, such as authorized by CEHA (County Environmental Health Act), in the monitoring and regulation of air toxics.
13. The Council supported the NJDEP's concept of enhancing then current technology-based control strategies with a planning approach that recognized the complex aspects of the problem to achieve needed reductions.
14. The Council recommended that the NJDEP emphasize the multimedia nature of the air toxics problem and that all bureaus within the NJDEP should address these pollutants.

At the time of the 2000 CAC public hearing, the NJDEP had three overarching strategies in place to reduce air toxic emissions:

1. **Permitting**: Control technology & risk assessment
2. **Planning**: Side benefits from ozone and particulate regulations.
3. **Enforcement**: Voluntary reduction through public disclosure, compliance assistance and pollution prevention education.

In addition to the NJDEP program for air toxics, there was a federal program. The goal of that program was to reduce air toxics by 75% from their 1993 levels by the year 2010. The purpose was to reduce the cancer rates and to reduce some of the other adverse health effects on the respiratory, neurological, immune, and reproductive systems from air toxics. Around the year

2000, there were approximately 200 million vehicles in the United States. It takes 15 years to turn over the fleet. The NJDEP goal was to reduce air emissions in the form of toxics as much as 70% by the year 2020 with the new Tier II standards for cars. The NJDEP hoped to eliminate unacceptable cancer risk from at least 95% of the population.

Also in 2000, the NJDEP identified a list of 30 hazardous air pollutants representing the greatest threat to public health in the largest numbers of urban areas. Those most common to urban areas are benzene, formaldehyde, mercury, and hydrocarbons. Additionally, the NJDEP identified 25 air toxics of greatest concern in New Jersey by evaluating projected concentrations of these toxics and comparing them to health benchmarks, which are concentrations below which no harm to human health would be expected.

Although the USEPA is projected to have a 70% reduction in toxic emissions from Tier Two Mobile Source Controls, Northeast States for Coordinated Air Use Management (NESCAUM) projected only a 30% reduction because of the non-road sector. It was predicted that benzene, 1,3 butadiene, and formaldehyde will continue to be a reduction challenge. According to a previous CAC hearing presentation (April 2010), the chemical industry had done much to improve air quality in New Jersey over the years. During the years of 1987 to 1994 the chemical industry in New Jersey reported emission reductions of 60% with an increase in production of over 14%.

As part of this year's public hearing, the Bureau of Air Monitoring indicated that the NJDEP air toxics monitoring consists of volatile organic compounds (VOCs), ethylene oxide, and metals. Sixty-eight VOCs are monitored as 24-hour samples. Of these 68, 43 are known hazardous air pollutants and 55 have health benchmarks. A health benchmark is a chemical-specific air concentration above which there may be an effect on human health, such as an increased risk of developing cancer or some non-cancer health effect. Additionally, air monitoring is performed for 41 metals and elements, 13 of which have health benchmarks and 11 are known HAPs (antimony, arsenic, cadmium, chlorine, chromium, cobalt, lead, manganese, nickel, phosphorus, and selenium). The air toxics in New Jersey that are at concentrations above health benchmarks are acetaldehyde, acrolein, benzene, 1,3-butadiene, carbon tetrachloride, chloroform, chloromethane, 1,2-dichloroethane, ethylbenzene, formaldehyde, tetrachloroethylene, and cadmium. A table of air toxics and associated health benchmarks can be found in the Appendix on pages 41-42.

Due in part to CAC recommendations in 2000, the NJDEP has expanded its air monitoring network across the State of New Jersey. A map in the Appendix (see page 30) illustrates New Jersey's extensive air monitoring network. A table containing a list of all air monitoring stations throughout the state and the parameters monitored can be found on page 31. A county-level map of the State's Air Toxics Network can be found on page 32, and a summary table (as of 2021) of the annual average concentrations of all volatile air toxics (VOCs) monitored in New Jersey is located on pages 33-34. Trends of select monitored air toxics can be located on pages 35-40. Monitored air toxics with risk ratios greater than one in 2021 can be found on page 40. Source apportionment of air toxics categories for the entire state and by county and be found on pages 43-46.

Based upon the data presented by NJDEP, the overall impact of air toxics in New Jersey has been reduced. It is clear from the data presented that the greatest contributors of air toxics are mobile sources, both on road and non-road sources. The contributions of nonpoint (area) sources are also a significant contributor to air toxics. Point sources account for a very small percentage of air toxics in New Jersey. We note that diesel particulate matter accounts for the overwhelming majority of impacts in New Jersey to cancer, with a smaller, although not insignificant, contribution to cancer coming from formaldehyde. It is with this background and the testimony summarized below which forms the Council's recommendations in this year's hearing.

As part of the recommendations to the Commissioner of NJDEP, the Council has considered the following questions:

- Are the number and locations of the air toxics monitoring stations, and the frequency of sampling sufficient?
- Are the target air toxic pollutants appropriate, and should we focus on fewer targets or a core number of targets?
- Should the DEP consider less expensive, but less accurate technology for monitoring air toxic pollutants?
- How can the DEP coordinate air toxics monitoring efforts within the DEP and with other state agencies?
- How can air toxics monitoring mitigate overburdened communities?

SUMMARY of TESTIMONY

(Note: Summaries are listed in order of speaker testimony.)

Sean Moriarty, Deputy Commissioner, NJDEP – Opening Remarks

The Clean Air Council is such a shining example of how we can work effectively across multiple levels of government, industry, academia, business to further positive change.

Over the years, the Clean Air Council has addressed a wide range of important and emerging air quality issues, including power plant pollution, interstate transport, air toxins, mobile sources, cumulative impacts, climate change, fugitive dust emissions, and the Impact of the COVID-19 Pandemic on Air Quality.

This year we're going back and revisiting the topic of Air Toxics – something we last explored in depth in 2000.
But this isn't about nostalgia – it's about measuring progress.

Air toxics are substances present in the atmosphere which are recognized by the USEPA and the NJDEP as being potentially harmful to human health.

This year's hearing is a retrospective looking at the progress New Jersey has made in reducing air toxic pollution and its impact on New Jerseyans.

The presenters who will follow me will each present on the progress New Jersey has made in almost a quarter century of emission control and regulation of air toxics.

The speakers will assist the Council in answering the following:

- What were the historic and current sources of air toxics? How has New Jersey's air toxics profile changed?
- What are the health effects and potential exposures to air toxics?
- What does ambient air monitoring and modeling over the past 23 years indicate are the trends for air toxics?
- How should the department identify emerging air contaminants and develop programs to minimize their impact?
- What risk assessment tools and other studies are, or should be available as technology and science has advanced for use in regulatory determinations?
- What are some creative solutions to reducing air toxics impacts? (Industrial vs. Commercial vs. Consumer)
- Are new regulations needed? Are current rules adequately enforced?
- What are the impacts resulting from the recommendations made in the 2000 Clean Air Council report? Are these recommendations still relevant and what new recommendations should be made?

Regulatory Work

The department has implemented several rules over the past 20 years to reduce emissions from air toxic pollution sources including cars, trucks, power plants, industrial, commercial, and institutional facilities.

This includes updates to our Air Permit rules to require the reporting of two new air toxics and known air toxics at lower levels for evaluation for offsite health impacts and ways the impacts can be eliminated or mitigated.

In addition to providing that information so the Department can effectively regulate these emissions, the same information is available to the public on the *What's in My Community App* so that they can engage in the public review process more effectively knowing the potential impacts from proposed sources.

We have also taken steps to better address exposures associated with commodity fumigation – where many of these operations are located in our overburdened communities.
We've also taken significant steps to reduce emissions in our transportation and mobile source sectors through the Cargo Handling Equipment Rule, which will require ports and goods movement operation to replace their old equipment with new units equipped with the latest air pollution control devices that will reduce air toxics including diesel particulates.

The Advanced Clean Truck Rule which will require an ever-increasing amount of Zero Emissions Trucks to be sold for use in New Jersey, reducing not only Air Toxics but also the pollutants responsible for climate change.

And we have begun to stakeholder and prepare a proposal to adopt California's Advanced Clean Cars II regulations.

Beyond rules, New Jersey continues to make targeted investments to reduce mobile source emissions by transitioning mobile sources to sustainable clean equipment in all our communities, but especially in overburdened communities.

This ongoing effort will ensure that funds are available for clean, equitable transportation projects that will improve air quality and reduce the effects of climate change, while moving New Jersey toward 100 percent clean energy by 2050.

And today's conversation is particularly relevant in light of the State's work on environmental justice.

The Department adopted the EJ Rules on Monday.

Implementing the State's historic EJ Law – signed by Governor Murphy in 2020 – the rules will provide us all with an opportunity – and most importantly – the tools to better address historic inequities that have left New Jersey's overburdened communities subject to a disproportionately high number of environmental and public health stressors, including pollution from numerous industrial, commercial, and governmental facilities and their attendant health impacts.

Critically, when discussing air toxics and in a way that can only enhance the efforts we just discussed, the EJ Law enhances existing environmental laws that did not previously enable DEP to consider environmental and public health stressors on a community level and empowers DEP to evaluate pollution potential on a facility-wide basis and apply conditions that will help facilities avoid and minimize adverse impacts.

The EJ Rules were developed through an extensive stakeholder process that brought together affected communities, environmental and public health advocates, and leaders in business and industry to offer critical insights that shaped the regulations – including many people currently in this room and on the Council – will enhance upfront community engagement and, using our Environmental Justice Mapping, Assessment and Protection (EJMAP) tool, provide the basis to compare and address disproportionate stressors in our most vulnerable communities.

I encourage you to check our website to see what EJMAP can do, view our extensive FAQs and some of the other guidance we have prepared to assist in the rollout.

Closing

Although the speakers today will share that New Jersey has made significant progress in reducing air toxic pollution and its impacts, more remains to be done to ensure all New Jerseyans benefit from breathing cleaner air. The Commissioner and I are looking forward to the Council's recommendations to the Department on future program strategies to assess and address risks from air toxics in New Jersey.

In closing I would like to thank the Council for their service including Chairman Allen Weston, Vice-Chair Maria Connelly, Hearing Co-Chairs Dr. Leonard Bielory and Michael Egenton and Hearing Co-Chair John Valeri.

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Francis Steitz, Director, Division of Air Quality, NJDEP

Ambient Monitoring and Analytical Modeling of Air Toxics in New Jersey

Summary
The NJDEP Air Toxics program monitors Air toxics through Ambient Monitoring, Physical measurement certain air toxics at four locations, and Analytical Modeling using computer numerical models to analyze multiple air toxics over the entire state.

Over the past 20 years observed and modeled Air Toxic level have been reduced, although certain high impact pollutants including diesel particulate, benzene, 1,3-Butadiene, and formaldehyde remain above levels where potential health impacts occur.

Recommendations for Consideration

- Environmental Justice
    - How can air toxics monitoring help overburdened communities?
    - How can cumulative risk be evaluated in overburdened communities?
- Air Monitoring
    - Are the number and locations of the air toxics monitoring stations sufficient?
    - What additional air toxics should be monitored?
    - Should the DEP consider less expensive but less accurate monitoring technology?
- Air Quality Regulation & Evaluation
    - Should the Emission Statement program be expanded?
        - Source types required to report Air Toxic Emissions;
        - List of substances reported ;
        - Reporting level reported (facility level vs stack level).

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Joann Held, Air Toxics Services

Addressing Air Toxics in New Jersey

The NJDEP Air Toxics program has done a good job of limiting emissions from new and modified air pollution sources and protecting those who live, work, or attend school nearby. But there remain many areas in the state where citizens are subject to emissions from under-regulated sources or from a combination of air toxics sources. This is the next frontier for air toxics control in New Jersey. Finding and addressing these sources can be a daunting task, but the availability of new data and new tools to take advantage of these data will make this increasingly possible in the next few years.

Recommendations in the 2010 Clean Air Council Hearing Report that still need to be addressed:

- Develop Procedures to Routinely address Cumulative Impacts in Environmental Justice Communities;
- Perimeter Monitoring;
- Identify sources that need additional scrutiny (19b).

While it is impractical to do cumulative impact assessment for every neighborhood, such as that done for Camden Waterfront South (2002-2005), there are new datasets and new tools which can be used to identify potential high-risk areas.

- AirToxScreen (formerly known as NATA): Review of the AirToxScreen results produced by USEPA can help to develop strategic plans for the control of air toxics by identifying critical source categories as well as potentially high-risk neighborhoods.
- Mapping tools developed for EJ Rule: These may be useful beyond the newly established EJ program to help identify high risk areas outside of the permitting process.
- Perimeter Air Monitoring Methods: Some air monitoring campaigns established at the perimeter of sources that appear to be insufficiently controlled may provide evidence for findings of violation of Subchapter 5: Prohibition of Air Pollution. The CSRRP PAM Guidance document (draft to be released soon) may provide a good structure for doing this work.
- Community monitoring data: There are numerous community monitoring projects ongoing and many more on the horizon. The tools being used are not compatible with establishing unhealthy exposures, but the data could be used to identify areas with high risk relative to the rest of the state. A database where all this information can be compiled and studied should be established.
- Residual Risk analysis using new Emission Statement Data: When a few years of data have been collected for the 13 HAPS added to Subchapter 21 in 2021, a simple residual risk analysis might serve to spotlight areas of potentially high risk.

Possible Strategies to address areas with high relative risk identified by these assessments.

- Enforcement & Compliance Assistance (including compliance alerts);
- Energy Efficiency Projects;
- Waste Handling Best Management Practices;
- Mobile Source Emission Reduction Programs (including off-road equipment);
- Re-establish the Air Toxics Steering Committee.

Air Toxics Steering Committee

Early in the development of the Air Toxics program, the NJDEP Air Program established an Air Toxics Steering Committee, inviting participants from each part of the Air Program (permitting, monitoring, enforcement, etc.) plus staff from Science & Research, Pollution Prevention, and other parts of the Department. This Committee met about once a month to discuss air toxics related issues that cut across our various programs and provide some coordination. The Steering Committee was also a way to tap into the knowledge and skills present in other parts of the Department. Since the Air Toxics program is decentralized (with a very small number of staff

focused on just air toxics), having such a committee was proven to be an effective way to manage the diverse aspects of the program and to bring in the help needed when new issues arose.

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Kim Gaddy, New Jersey Environmental Justice Director, Clean Water Action and Chair, NJDEP Environmental Justice Council

We Just Want to Breathe Clean Air

No written summary provided.

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Raymond Cantor, Deputy Chief, Government Affairs, NJ Business and Industry Association

Progress, Cooperation, and an Uncertain Future

Good morning. My name is Raymond Cantor, and I am the Deputy Chief Government Affairs Officer for the New Jersey Business & Industry Association. NJBIA was founded in 1910 as a group of manufacturers sharing ideas about workplace safety. Over the past century NJBIA has grown to be the largest statewide business association in New Jersey, representing businesses from every sector, from large industries, technology companies, clean energy companies, utilities, and retail giants such as Amazon, to thousands of smaller and Main Street businesses that we all utilize every day.

Our mission is to advance the competitive excellence and financial success of our members. Because NJBIA's membership is diverse, my testimony is not focused on any particular industry or activity, but rather will be general in nature reflecting the viewpoints of the business community as a whole.

It is also not my purpose today to provide you with statistics you already know, or to provide you with technical or scientific advice, which is beyond my expertise. Rather, I want to give you the perspective of the business community as a partner and fellow citizen of this state and as entities that are subject to regulation. We are not seeking to avoid regulation. We understand the necessity of government regulation when it comes to air emissions, and we benefit from a level playing field.
We seek balanced, reasonable regulation, and a recognition that society must accept certain tradeoffs when it comes to emissions. That is why emissions can never, at least not with any foreseeable technology or practices, as a general rule, be set at "zero" and why we set policy by developing reasonable health and environmental standards for emissions. It is why the Department of Environmental Protection's air program has been so successful since its modern inception with the passage of the New Jersey "Air Pollution Control Act" in 1970. It has

managed to both protect the public health and allowed businesses to operate within confined parameters for emissions.

However, balance is always necessary and we must be aware of the societal benefits of business in general, and manufacturing, in particular. New Jersey has already lost over 278,000 of its previous 529,000 manufacturing jobs between 1990 and 2019. Previously, manufacturing represented nearly 15% of the state's nonfarm employment. Now that number is 6%. Still, we remain a strong manufacturing state with over 250,000 jobs, jobs we want to keep. While there are many factors responsible for those job losses, we cannot deny that regulatory burdens played at least some part in these job losses as well as the failure to bring manufacturing back to the state in any significant way. I will note, anecdotally, that a colleague of mine, recently returning from a trip to North Carolina, told me that their state's air program could not keep up with the permit requests from new manufacturing moving into the state. New Jersey should have that problem.

I want to focus my presentation today on three points: one, we have made substantial progress in reducing toxic air emissions in our state over the last 25e years; two, part of the success of those efforts resulted from the relationship the Department's air program has developed with the regulated community so that new regulations that mandate the reduction of emissions have been done rationally, methodically, and in a manner that often takes into account industry concerns. Finally, I want to push for the continuation of predictable, risk-based standards. The business community has significant concerns that there is a trend to ignore the lessons we have learned from our past successes, and that we are beginning to be driven more by politics than science-based and balanced policy considerations.

The Department has been monitoring the level of hazardous air pollutants in the ambient air since 1989. While some hazardous air pollutants (HAPs) remain above health-based standards, we have seen measurable reductions, and many are now below health-based standards. We have seen these reductions through a variety of measures, including the imposition of maximum control technologies on point sources, and regulations on consumer products, architectural coatings, fuel containers, and other non- point sources of pollution. We have also seen reductions as the result of emission controls and reformulation of fuels for both on-road and off-road vehicles. The Department's diesel retrofit program was very successful in taking heavily polluting truck and bus engines off the road, and it did so in a manner that made it economically viable to make those retrofits.

There has also been a considerable number of recent statements that the Department's environmental programs, in particular its air program, does not do enough to protect individual communities from toxic and other air pollutants. While no program is perfect in its inception or execution, such broad statements ignore the fact that the Department does have representative air monitoring stations that gives a general indication of the condition of air quality, even in more urbanized areas.

The Department's regulatory efforts have produced statewide reductions in both criteria and hazardous air pollutants, bringing benefits to everyone. Significantly, and I believe largely overlooked, is the testing and standards for individual air permits, especially for Title V and

other large industrial emitters. These facilities not only have to meet increasingly stringent emission standards and control technologies, but they are required to perform area-specific risk assessments. These risk assessments do consider local conditions and cumulative pollution. Modifications, including stack height and operations, are required if standards would not be met under the original proposal. I would be remiss if I did also not point out that, despite its demonization, point source industrial facilities account for only 4%t of toxic air emissions in New Jersey. Contrary to popular rhetoric, air pollution is decreasing, neighborhoods are more protected, and health outcomes are improving, all as we work to keep good paying jobs in our state. I don't think we talk enough about the progress that has been made in cleaning our air over the last 25 years, or longer, and of the Department's work in achieving this. We live in a time when bad news gets the headlines and is used to promote policy objectives. Rarely, if ever, do we hear about how toxic and other criteria pollutants have been reduced and many are within safe ranges or meet standards. While no one should have to breathe unhealthy air, a misperception has been cultivated by advocates, the media, and some policymakers, that things are getting worse, not better, or that these issues are being ignored. It is to avoid those misperceptions that we collect data and issue trends reports. Knowing the facts allows us to make progress with objective data so that we can make the best, and, hopefully, rational and balanced decisions.

I also want to recognize the invaluable cooperation that has existed between the Department and the regulated community, especially industrial facilities and manufacturers. While no one would suggest that the Department should not serve as the regulator with the primary purpose of protecting the public health and safety, and while many in the regulated community would argue that the Department may have engaged in "overregulation," I believe that the dialogue that the Department has purposefully engaged in with the regulated community has allowed for those reductions to be made in a rational and balanced manner and has led the air program to become one of the most successful in the nation. Cooperation and dialogue, much like compromise, are not dirty words.

This Council is one example of that cooperative relationship by grouping together representatives from many backgrounds, including the business community, to come together to solve air emission problems. The Industrial Stakeholder's Group has been highly successful in fostering good public policy and achieving results. The stakeholder meetings the air program holds when it is contemplating regulatory or policy changes, including when the Department is considering general permits, guidance documents, and new toxics risk assessment procedures, help to highlight potential issues and very often results in better policy.

There is a lack of appreciation among the general public of how much the business community works with the Department to achieve air pollution reductions. Often, the question is not what, but how and in what timeframe. These questions are vital to ensure that New Jersey not only meets its environmental and public health obligations, but also to help ensure that our citizens have good paying jobs and healthy and happy lives. Environmental regulation is complicated. The Department cannot do it on its own, at least not well. Cooperation and information sharing are necessary for a successful regulatory program. We ask that the Department be a bit more vocal about the achievements that have already been made.

Finally, we are concerned that a failure to recognize the progress that has been made is leading us away from the sound policies that have resulted in these achievements. Our air program has focused on two key strategies, requiring technology and setting health-based standards. While different in their approach, both strategies are science based and are founded on predictable, risk-based objectives. We fear that we may be moving away from these sound, and effective strategies and replacing them with subjective criteria based on political, small "p", standards.

The recently enacted Environmental Justice Law (the Department's implementing rules have been proposed, but not adopted as of today) is an example of that trend. The EJ law sets requirements for the review of permits, including air permits, that are specifically not based on health risk standards. Rather, the law uses surrogate "stressors" which are more perceptually a problem than they are in reality. Further exacerbating the move away from objective standards is the deference to community objections which may result in additional, undefined, conditions being placed on a facility seeking a permit or a permit renewal.

This is not the forum to relitigate the efficacy of the environmental justice law or its implementing regulations, but it is important to recognize the recent tendency to move away from risk-based, objective criteria, and now base permit decisions on those with the loudest, or most influential voices. It only makes it worse that new Title V and other major facilities cannot be located in most of the state despite the fact that they meet all environmental standards, would economically benefit communities, and there is no health standard being violated.

While in no sense am I arguing that community concerns should not be listened to and addressed Where warranted, a regulatory program cannot effectively exist if it is purely subjective in its application. I know you have heard this mantra a million times from the regulatory community, but most businesses want a predictable and efficient regulatory process. Tell us upfront what we need to do and help create a regulatory process where we can get timely approvals. While there is nothing the Department can do about the laws that are in the books, the Department does have the ability to work within those laws to retain predictable, and health-based regulatory processes. In conclusion, I want to thank this Council for inviting me here today to give the perspective of the business community. We are no longer living in the era before the Clean Air Act when there was little, if any controls or considerations about toxic air pollutants. The business community recognizes the need to limit air pollutants and to have healthy air to breathe. We have been your partner in this effort for decades. We want to be good neighbors. We live here too, and we share the same values. We have come a long way in reducing air pollution from all sources, including toxics, since the inception of the CAA and in the last 25 years. Let's recognize those improvements, acknowledge that both government regulation and business cooperation are necessary to achieve even greater reductions, and let's ensure that tomorrow's toxics regulatory programs learn from the practices that got us to this point.

- The state, through efforts led by the Department's clean air program, has made substantial improvements to air quality, including toxic air pollution, over the past 25 years;
- The business community has been a willing partner with the Department to ensure that hazardous air pollution standards, permits, and testing requirements have been done in ways that are reasonable, science based, and implementable for the regulated community. These cooperative efforts should continue;

- There are misperceptions about the progress that has been made and the efforts of the Department to address air pollution concerns in neighborhoods. More needs to be done to communicate the progress that has been made;
- The Department must reject efforts to impose subjective and non-science-based standards into its regulatory program. Toxic air pollution standards need to be continued to be based on sound science, health risk, and be technologically achievable.

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Panos Georgopoulos, Professor, Environmental and Occupational Health Sciences Institute, Director of Rutgers University Computational Chemodynamics Laboratory

Geospatial analysis of Air Toxics

Rationale: Regulatory decision making for air toxics relies on assessments of their potential human health effects; it is therefore important to understand the relationship between disparities in chronic low-level exposures to Air Toxics and disparities in COVID-19 mortality.
It is also important to understand this relationship in a sociodemographic and environmental justice context because cumulative exposures to air toxics are especially relevant for overburdened communities and sensitive populations such as children and the elderly.

Background: Numerous studies in the US and internationally assessed various environmental factors influencing COVID-19 incidence and severity, including past exposures to air pollution. However, air pollution considerations focused almost exclusively on Criteria Pollutants: several ecological studies (and one cohort study) found consistent positive associations of elevated COVID-19 incidence and mortality with past $PM_{2.5}$ levels; similar associations have been established for NO_2, while the directionality of such associations for O_3 is not consistent across locations. Only two studies assessed in a systematic manner the impact of past exposures to air toxics on COVID-19 outcomes: a nationwide (CONUS) county-level study by SUNY (Petroni et al., 2020) and our (Rutgers) New Jersey statewide municipality-level study (Ren et al., 2023).

Methods used in the COVID-19 and Air Toxics Studies: Both the SUNY and Rutgers studies implemented hierarchical statistical models, relating COVID-19 mortality to chronic individual and cumulative exposures to air toxics, while controlling for individual pollutants and multiple known environmental, demographic, and socioeconomic risk factors. The studies considered both the cumulative respiratory Hazard Index (HI) and individual respiratory Hazard Quotients (HQ) for specific toxics: formaldehyde, acetaldehyde, acrolein, naphthalene, and diesel PM were selected because they are, on average across the US, the top contributors to respiratory HQs (and collectively accounted for over 50% of the total US respiratory HI in 2014). Since most air toxics levels have been decreasing over time, the NATA modeled estimates for 2014 were used to approximate average levels of concentrations and HQs between the years 2010 and 2019. Furthermore, our (Rutgers) study systematically evaluated consistency and robustness of findings using six alternative Geostatistical models and two Machine Learning models.

Results and Conclusions: Statistically significant associations of both individual and cumulative chronic air toxics exposures with county-level COVID-19 mortality were found for CONUS; similarly, statistically significant associations of both individual and cumulative chronic exposures with municipality-level COVID-19 mortality were found for New Jersey. Exposures to air toxics are higher in overburdened communities, where many other environmental, demographic and socioeconomic factors represent additional risks leading to adverse COVID-19 outcomes. Though these studies have limitations, as they primarily rely on modeled estimates and aggregated data, they demonstrate robust consistency in findings both nationwide and for New Jersey. In fact, the findings demonstrate that substantial increases in COVID-19 mortality are associated with small increases in low concentrations of air toxics, suggesting that exposures at levels below the chronic (non-cancer) respiratory hazard reference concentrations (RfC) may heighten population vulnerability to COVID-19.

Recommendations: The results of the studies summarized above suggest that:

- The potential links between chronic exposures to air toxics and COVID-19 mortality should be considered when evaluating the efficacy of pollution prevention strategies.
    - This recommendation is further supported by the fact that plausible biological mechanisms (adverse outcome pathways) increasing vulnerability to COVID-19 due to chronic air toxics exposures are also potentially relevant to other infections and respiratory diseases.
    - This recommendation is also further supported by the fact that statistically significant associations of disparities in COVID-19 mortality with disparities in individual and cumulative chronic exposures to Air Toxics are found for low levels and small increases in their concentrations.
- Expanded monitoring of Air Toxics, including focused studies involving local and personal monitoring in overburdened communities, should be considered in order to reduce uncertainties in the assessment of health risks and improve chemical risk management and public health policy.

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Dennis Hart, Executive Director Chemistry Council of NJ, President State Street Associates and Tom Wickstrom, ERM Worldwide Group Limited

What industries have been doing to address and reduce Air Toxics?

- Air pollution sources in the chemical and petroleum sectors in the US comply with over 100 federal and state regulations and policies controlling and minimizing air toxic emissions;
- The refining sector in particular has invested heavily in emissions reductions and compliance since 2000, including a near real time air toxics monitoring program around every refinery in the US;
- DEP's risk assessment process is conservative and on top of the federal regulations, and currently relies solely on one tool for assessment;

- DEP should consider the value of the data from FLM programs at both New Jersey refineries, and how these data may be used to supplement health risk assessment in the areas of these facilities, and used as weight of evidence during risk assessment reviews;
- DEP should consider frequency of occurrence in evaluating operating scenarios for health risk assessment;
- NJ's air toxics ambient concentrations are largely resulting from non-industrial source categories, such as transportation emissions. DEP should carefully consider the increasing costs and decreasing benefits of further air toxics requirements for the industrial community.

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Dr. Robert Laumbach, Associate Professor, Department of Environmental and Occupational Health and Justice, Rutgers School of Public Health, EOHSI

Air toxics in NJ: Some Thoughts on What We Might Be Missing

1. Characterization of risk from air toxics has two major limitations: lack of knowledge about local spatial and temporal distributions of air toxics concentrations, and lack of methods to quantitatively assess human health risks from multiple chemical and nonchemical stressors.

2. Given limited knowledge about local air toxics concentrations, NJDEP should consider innovative approaches to measure local air toxics, prioritizing likely local "hot spots."

3. Prioritize air toxics for additional characterization based on what is known already. Diesel particulate matter is an obvious target because it dominates estimated cancer from air toxics that have been studied. Diesel engines are also a source of other air toxics such as formaldehyde, acetaldehyde, and benzene.

4. Known concentration gradients of DPM near roadways are not captured by central monitoring sites, but they will also not be captured by community monitoring with low-cost $PM_{2.5}$ monitors, which are not sensitive or specific for DPM and other diesel engine air toxics.

5. Community air monitoring should focus on novel ways to measure DPM and other air toxics, such as mobile monitoring with microaethalometers, to measure black carbon, which is much more sensitive and specific to DPM and the whole diesel mixture than $PM_{2.5}$.

6. Consider ways to include qualitative and semi-quantitative factors in characterizing risk from multiple sources of air toxics, given the limitations of quantitative risk assessment for complex mixtures of chemical and nonchemical stressors.

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Barbara Goun, Ph.D., MPH, New Jersey Department of Health, Principal Investigator, NJ Environmental Public Health Tracking Program

Air Pollution and Cancer

- Current evidence suggests that air pollution contributes to lung cancers among both smokers and non-smokers, and this is especially likely in highly polluted areas in developing countries.
- Lung and bronchus cancer incidence in NJ has been decreasing steadily in males since ~1990-1995. In females the incidence of lung cancer has decreased slightly since ~2000-2005
- While the age-specific lung and bronchus cancer incidence in males show a decrease by decade for 1990-2000, 2001-2010, and 2011-2020; the female age-specific lung and bronchus incidence rates have increased in the decades since 1990-2000.
- Using self-reported telephone survey data from NJ's Behavioral Risk Factor Survey, we know that NJ smoking rates in both males and females have continued to decline between 2011-2020. Rates of current smoking in in NJ adults as of 2020 however remain higher in males (13.7%), than in females (8.9%). This mirrors the national trend.
- While specific air pollutants and air quality within NJ cannot be directly linked to the lung and bronchus cancer incidence trends discussed during this presentation, air pollution contributes to adverse human health outcomes and some cancers.

Recommendation:

- Further research is needed on the impact of both indoor and outdoor air quality on lung cancer incidence and other adverse health outcomes to guide the expansion of air monitoring.

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Barbara Morin, Environmental Analyst, Northeast States for Coordinated Air Use Management

Perspectives on Air Toxics Priorities

NESCAUM commends NJDEP on the many actions that the agency has taken to reduce exposures to air toxics in New Jersey and to increase public awareness on this issue. Those actions include evaluating short- and long-term risks associated with facility emissions and consideration of environmental justice implications in the air permitting process, implementation of an innovative fumigation rule, monitoring of air toxics at several sites, and providing a website with important information about air toxics and related issues, including a diesel particulate cancer risk map, the *What's in My Community?* interactive tool, and information on community air monitoring projects.

EPA modeling evaluations have identified ethylene oxide (EtO) as the air toxic associated with the highest cancer risk in New Jersey, as well as in many other states, due to emissions from commercial sterilizer facilities. NJDEP is currently measuring EtO at four sites and the levels of that pollutant monitored at those sites are substantially higher than those predicted by EPA, even

for monitors that are not near a sterilizer source. Monitored EtO levels in other states are also than those predicted by the EPA study, but the monitored EtO levels in NJ are generally higher than those measured in other areas except Pittsburgh, PA. NESCAUM is recommending that NJ DEP work to identify the reasons that monitored EtO levels in New Jersey are higher than the modeled predictions and higher than those measured in other states.

NESCAUM is also recommending that NJ DEP further evaluate the impacts of air toxics emissions from refining, storage, and distribution of petroleum products in the state. Tank farms in the Linden, NJ area may impact concentrations of benzene, a known human carcinogen, and emissions from the tank farms and the Bayway Refinery may impact levels of other volatile organic compounds in the community. NJ DEP has identified the areas around those sources as overburdened communities. Further characterization of emissions and ambient levels around those facilities may aid in reducing exposures and risks to neighboring residents.

Dr. Leonard Bielory, NJ Clean Air Council Member

Additional Post-Hearing Insights into Air Quality and Aerobiology (A^2Qua) program

- A^2Qua engages students and their teachers in a citizen science project that merges modeling and data collection to broaden understanding about pollen, climate dynamics and phenology. Recent considerations in environmental education have suggested that the goals for excellence in environmental education (e.g., NAAEE Guidelines for Excellence) in many ways mirror the goals and standards for science education (e.g., NGSS). In particular, it has been suggested that through the process of generating and revising mental and conceptual models, learners are able to work with both generic and context-specific ideas in tandem. By working with these ideas simultaneously, learners are able to draw conclusions about all or parts of environmental issue investigation and subsequently use these ideas in future learning projects.
- Citizen science programs pose excellent opportunities for individuals to engage in authentic science learning. Involvement in certain citizen science programs, defined broadly as scientists and non-scientists engaged in partnership to collect and analyze data, has been shown to result in increased scientific literacy and the development of skills in scientific practice. In addition, citizen science projects have also been shown to produce broader impacts, such as positive community engagement, self-efficacy among volunteers with respect to environmental action, and increased motivation to learn about.
- A^2Qua focuses on helping young people examine environmental issues around climate and health, make local connections, and create change through citizen science, peer education, digital media, and service learning. Outcomes include defining how well the educational setting is supporting these defined learning objectives to support scale up of the project and dissemination of information on climate and health. The overarching goal is to create a replicable model program for other middle and high schools on a national basis that will be distributed through professional associations and networks, publications, and established virtual platforms based on the program developed in New Jersey.

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PUBLIC COMMENTS

Sally Malanga

I am reaching out to you on behalf of Our Green West Orange.

We believe that the number one concern for clean air issues in residential areas is the use of gas-powered leaf blowers.

It is our experience that these devices are overpowered for their goal, which is to gather fallen leaves. They emit enormous amounts of gas fumes and particulate with one hour being equivalent to the emissions of 300 hours of car fumes, not to mention auditory pollution. "Gas blowers emit toxic particles that are inhaled through the lungs and contribute to asthma, strokes, heart attacks, congestive heart failure, chronic obstructive pulmonary disease and cancer. They particularly risk the health of landscape workers who feel the effects of toxic compounds found in benzene, 1,3-butadiene, acetaldehyde & formaldehyde. They must be banned now.

We used to use rakes. Whatever happened to them? The obsession landscaping workers have with capturing leaves is out of proportion to the noise and fumes involved.

It's time to ban these noxious devices to reduce our climate footprint and restore our air quality.

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Martin Bornstein

With regard to the Clean Air Council public hearings, I would like to mention an issue not often considered. In recent years I have observed that there is an increase and sudden fad of people buying fire pits and meat smokers for their homes, to put in their backyards. I am not against people doing things to gather and enjoy themselves, but there are a few things about this that concern me.

Both fire pits, to gather around, as well as meat smokers, are a source of much additional smoke pollution into our atmosphere, at a time when we are trying to limit pollutants and carbon-based emissions. My concerns with these are related to health issues, fire prevention, as well as air pollution. If someone uses a fire pit or meat smoker in a neighborhood where a child or an adult has asthma or other lung issues, this could trigger those people to have an attack. Another concern of mine is that with the current dry weather conditions and huge forest fires that we are seeing in New Jersey, due to dry conditions, I am afraid that these items could be a source to trigger such fires. I personally live at the edge of a small woods and this makes me a bit nervous.

I cannot tell you how much in aggregate fire pits and meat smokers add to the air pollution, but given the additional potential health concerns, as well as forest fire risk, I think that this is something that we should consider examining and possibly regulating. Again, I do not want to

limit people's personal enjoyment, but I think that given the overall circumstances, this may be something that needs to be looked at.

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Patti Selikoff

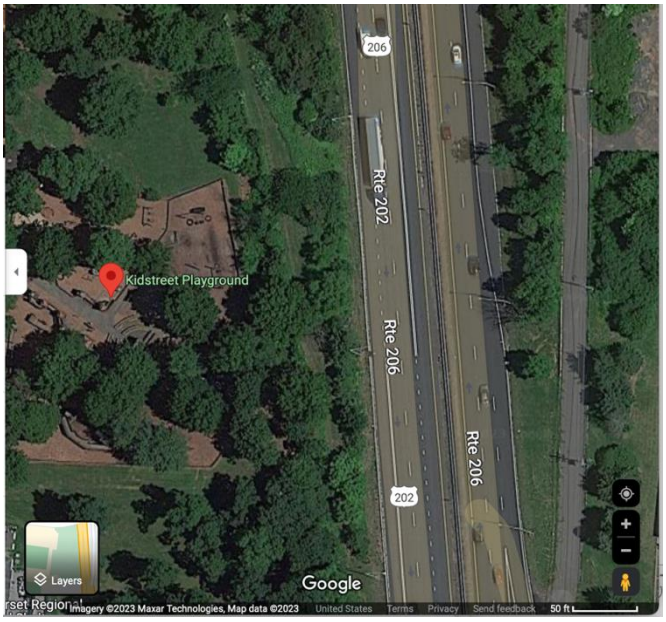
I want to first introduce myself as someone who has bachelors and masters in both chemistry and biochemistry with 7 years working with NYC Transit as a quality auditor in their capital construction department. What made me proud to work there was the opportunity to build projects that would serve and improve the public lives of NYC residents and visitors. I have since taken leave to raise my beautiful daughters aged 8,8 and 6, but my passion to serve and protect the public has not taken a break. I also value science and using my knowledge to be an activist on projects like clean air and water. Which brings me to my favorite park in my county of Somerset.

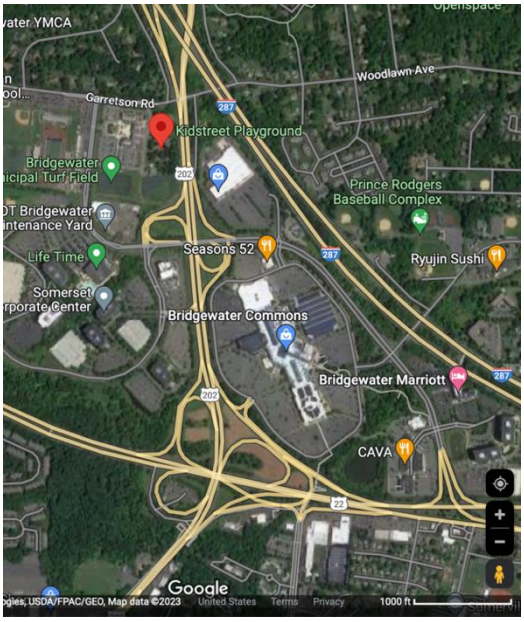
This particular park is surrounded with trees inside and outside the park, next to the police station, has a single entrance and exit, and a bathroom. As a mom of three young children, all these qualities are highly valued especially a real bathroom. Not one of those portable potty things.

It has a rating of 4.7 out of 690 ratings on google maps. I don't have numbers, but many families living in town, from nearby communities and many from as far as a few hours away visit the park.

This little gem is Kidstreet at 700 Garretson Road, Bridgewater, NJ 08807.

The reason I am bringing your attention to this park today, is to discuss my concern about the air quality. It is within 50 feet of a very busy Highway and every weekday from 4-6pm this road becomes a parking lot with cars moving about 5-10 MPH through this area because this is where US Hwy 202/206 intersects with Route 22 and Interstate 287as you can see on the maps below.





I have reviewed the air quality monitoring in the Bridgewater area and just 3 miles from this area, the CO2 emissions are significantly higher than the other two monitoring facilities and based off these numbers the CO2 emissions for this corridor are 92,356 tons per day. The kicker is the traffic here is actually much lighter than further down by the park.

Facility Emissions (1000 Tons/Year) Reported to Emission Statement Program

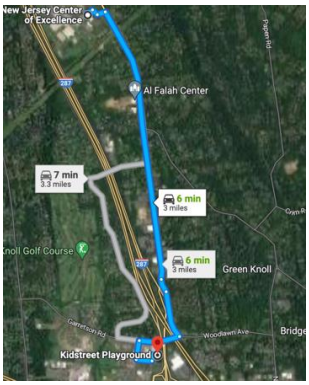
			2018	2019	2020	2021
35832	COE BRIDGEWATER LLC	CO2	33.71	31.63	32.93	32.84

Facility Emissions (1000 Tons/Year) Reported to Emission Statement Program

			2018	2019	2020	2021
35882	HERCULES ENTERPRISES LLC	CO2	0.64	0.72	0.72	0.72

Facility Emissions (1000 Tons/Year) Reported to Emission Statement Program

			2018	2019	2020	2021
36066	TMCLONE SYSTEMS LLC	CO2	11.99	10.97	11.22	11.46



As a mother and scientist, this got me thinking and asking the question, "How safe are my kids at Kidstreet?" Yes, we have this beautiful tree barrier but is this good enough? The township is proposing a large 30-foot Monument where the company may remove some of this barrier to have better line of sight for the oncoming traffic, and what is the health impact on our children if they decide to move forward with the project?

These are all really good questions that none of us can truly answer. So, I am requesting that the clean air counsel place a monitoring station in this location regardless of future endeavors so that parents and other community members will know whether or not our children are breathing safe and clean air. And if the air is not safe, hopefully we can work with the clean air and township councils to find a solution to keep it the gem that it is.

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Melissa Miles, New Jersey Environmental Justice Alliance

- EtO is definitely an EJ issue and more regulation is needed.
- Need to get more fence line emission monitoring around facilities in overburdened communities, especially those with a fire risk.

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Robert Rashkes

- Increase in recreational woodburning.
- Firepits and chimineas are being routinely sold. New homes are being built with fireplaces.
- Residences should be held as accountable as businesses when it comes to toxic woodburning emissions.

This morning [May 4] I read the 2022 Healthy Community Planning Report for West Orange Township whose hyperlink is below. The report includes information on West Orange's air quality for both cancer and non-cancer risk. I note that there are many recommendations for improving health and the environment made in the report for the purpose of educating the public. I note that there is barely a mention of the negative impact of recreational wood burning and wood smoke as a substantial way to improve the health and environment of the residents of West Orange and other communities who may have also been issued this report. I would like to see the inclusion of the dangers of recreational wood burning appear much more prominently in future Healthy Community Planning Reports.

A comprehensive report on the dangers of wood smoke is in the following hyperlink. https://www.ehhi.org/woodsmoke-exposures.pdf.

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APPENDIX

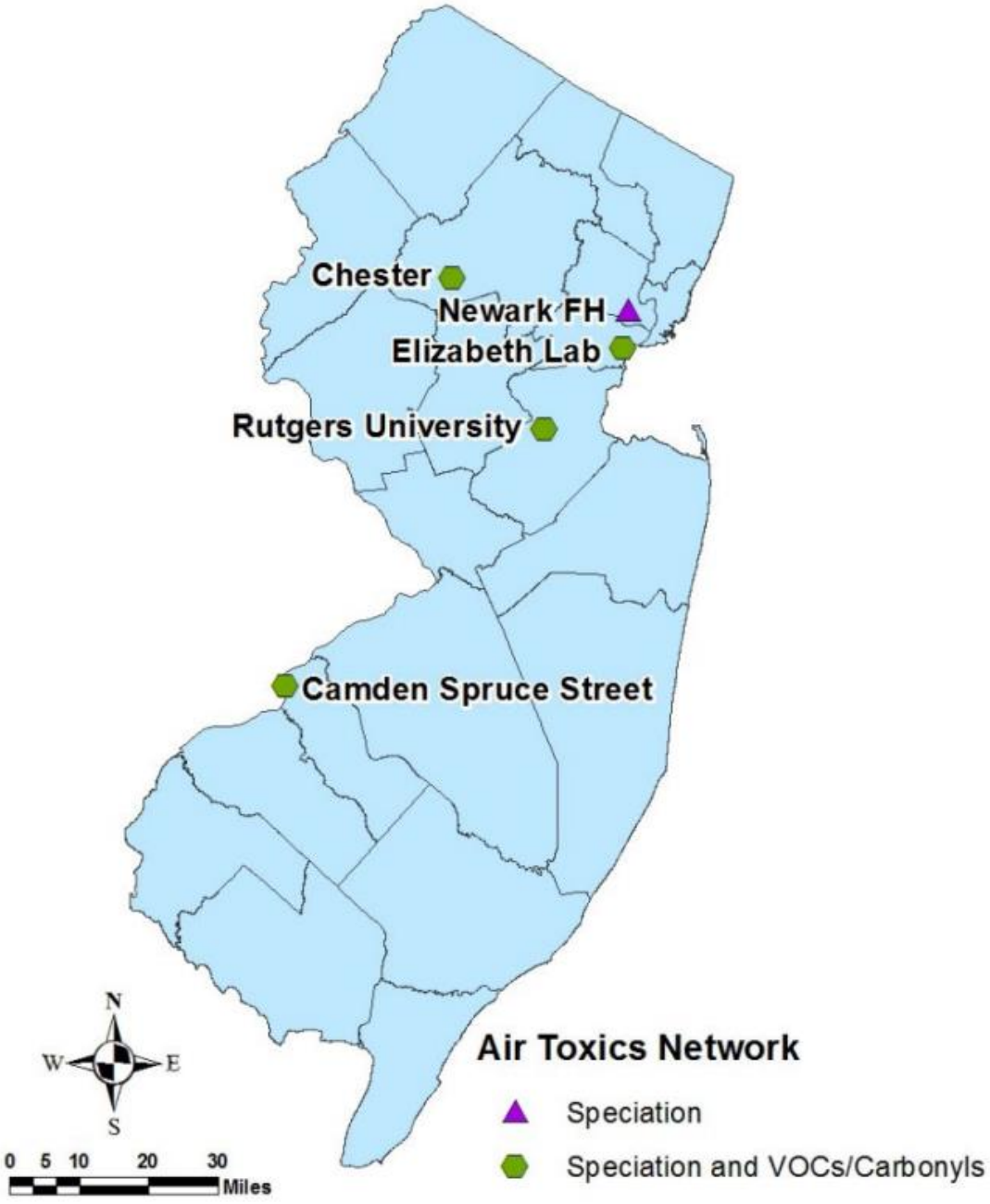

New Jersey Air Monitoring Sites in 2021
SUSSEX
PASS-AIC
Ramapo
BERGEN
Columbia WMA
Paterson
Leonia
Fort Lee Near Road
WARREN
MORRIS
ESSEX
Union City High School
Chester
Jersey City
Jersey City Firehouse
Newark Firehouse
HUDSON
UNION
Elizabeth
Bayonne
Elizabeth Lab
HUNTERDON
SOMER-SET
Rahway
Flemington
Rutgers University
MIDDLE-SEX
MERCER
Washington Crossing
Monmouth University
Rider University
MONMOUTH
Trenton
Colliers Mills
Toms River
Cattus Island
Pennsauken
Camden Spruce St
OCEAN
BURLINGTON
Clarksboro
CAMDEN
GLOUCESTER
Apcora State Hospital
SALEM
ATLANTIC
Brigantine
Millville
Atlantic City
CUMBERLAND
CAPE MAY
N
W
E
S
0 5 10 20
Miles
Map Legend
NJ Monitoring Site locations
County

2021 New Jersey Air Monitoring Network Parameters

	Monitoring Parameter / Monitoring Station	O_3	$PM_{2.5}$ (Filter-based)	Real-Time $PM_{2.5}$	PM_{10}	NO_2	NOy	SO_2	CO	Lead	Toxics	$PM_{2.5}$-Speciation	O_3 Precursors (PAMS)	BTEX & Black Carbon	Visibility	Acid Deposition	Mercury	Meteorological[a]	Solar Radiation
1	Ancora State Hospital	X																	
2	Atlantic City		X																
3	Bayonne	X				X		X						X				X	
4	Brigantine	X	X	X				X							X	X			
5	Camden Spruce Street	X	X	X	X	X		X	X		X	X		X				X	
6	Cattus Island															X			
7	Chester	X	X			X		X			X	X							
8	Clarksboro	X	X																
9	Colliers Mills	X																	
10	Columbia	X		X		X		X										X	
11	Elizabeth							X	X										
12	Elizabeth Lab		X	X		X		X	X		X	X		X			X	X	
13	Flemington	X		X														X	
14	Fort Lee Near Road			X		X			X					X				X	
15	Jersey City					X		X	X										
16	Jersey City Firehouse		X	X	X														
17	Leonia	X																	
18	Millville	X		X		X													
19	Monmouth University	X																	
20	Newark Firehouse	X	X	X	X	X	X	X	X	X		X		X				X	X
21	Paterson		X*																
22	Pennsauken		X																
23	Rahway			X															
24	Ramapo	X																	
25	Rider University	X		X														X	
26	Rutgers University	X	X	X		X	X				X	X	X				X	X	X
27	Toms River		X	X															
28	Trenton		X*	X															
29	Union City High School		X*																
30	Washington Crossing															X			
	TOTAL	16	14	14	3	10	2	9	6	1	4	5	1	5	1	3	2	9	2

X - Parameter measured in 2021.
*Did not operate in 2021.
NO_2 usually includes NO and NO_x.
a - Meteorological parameters include temperature, relative humidity, barometric pressure, wind direction & wind speed.

2021 Air Toxics Monitoring Network



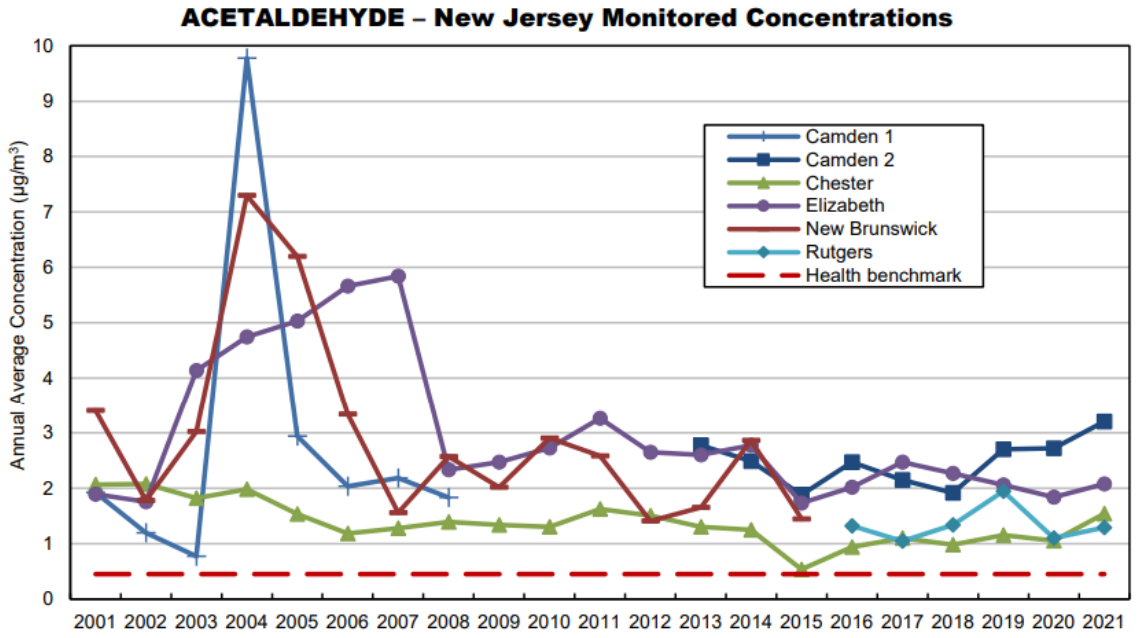
2021 Summary of Toxic Volatile Organic Compounds Monitored in New Jersey

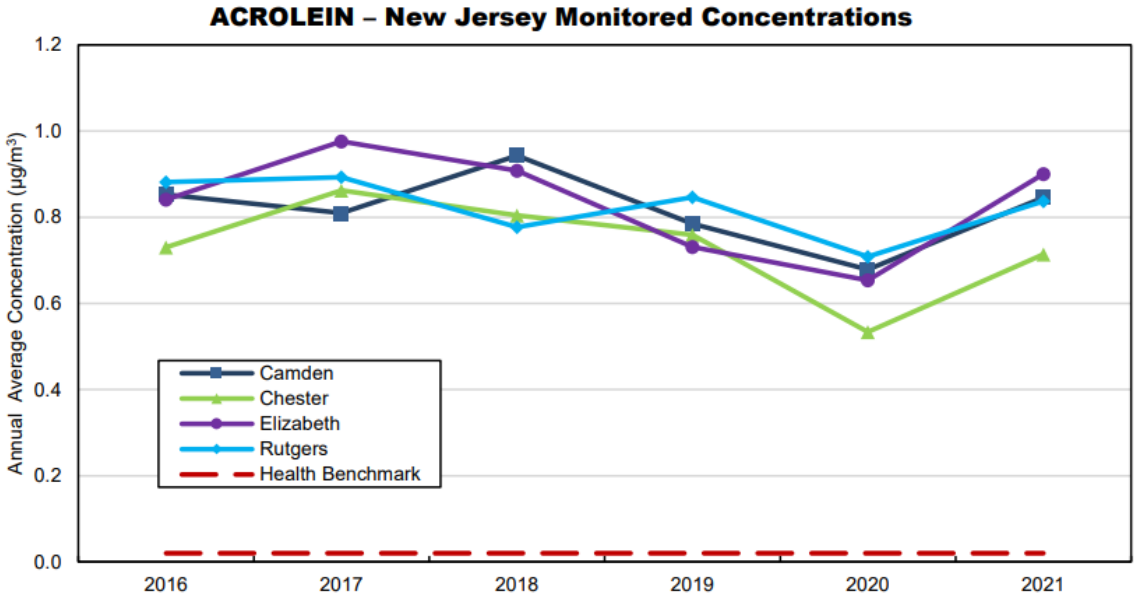
Annual Average Concentrations

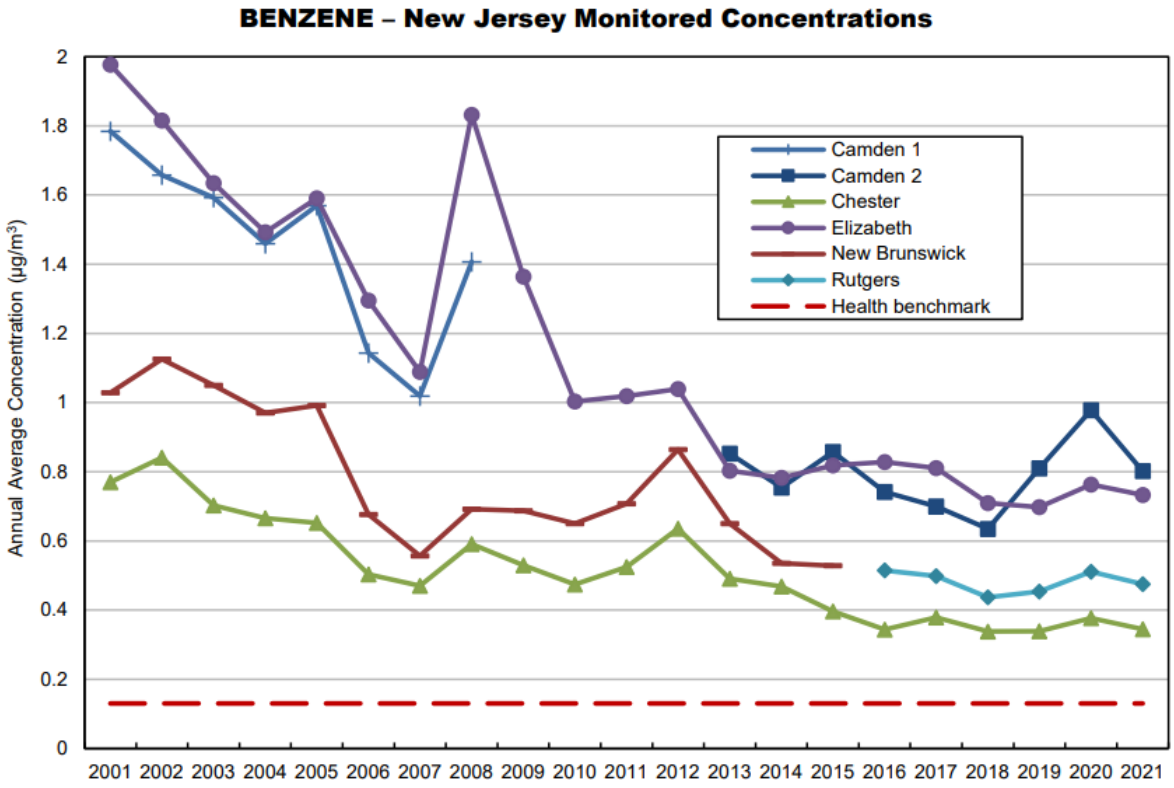
Micrograms per Cubic Meter ($\mu g/m^3$)

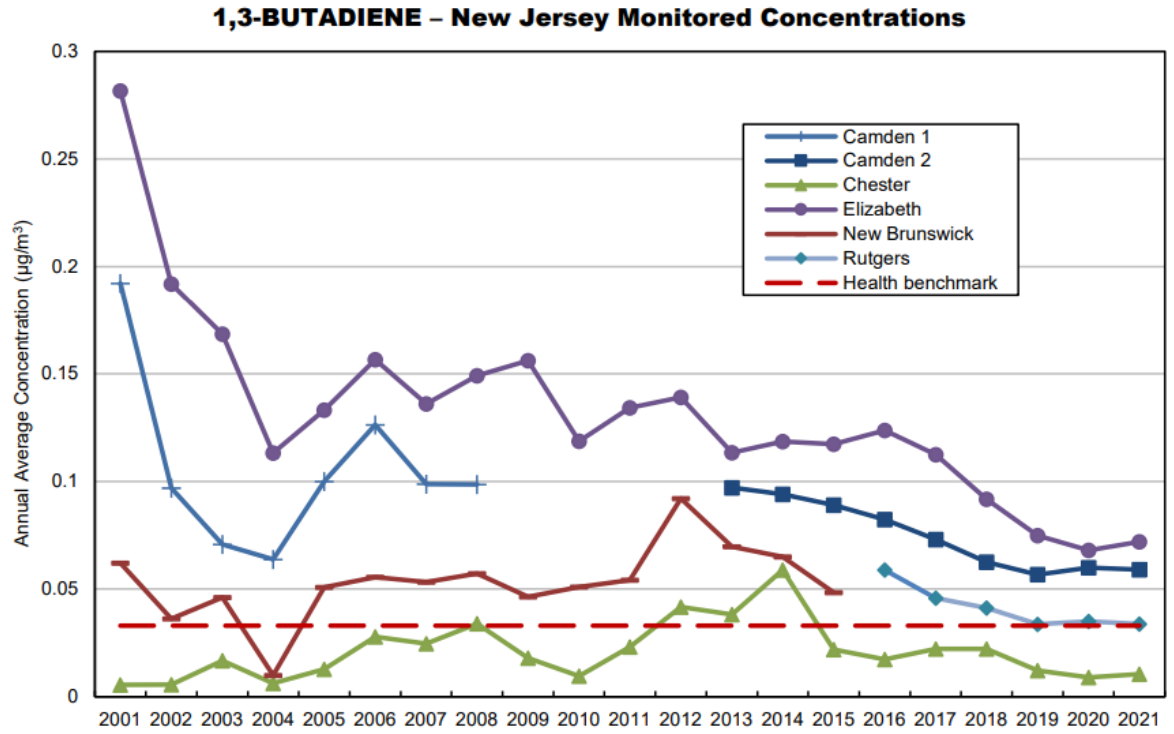
Pollutant	Synonym	HAP	CAS No.	Camden	Chester	Elizabeth	Rutgers
Acetaldehyde		*	75-07-0	3.202	1.54	2.074	1.292
Acetone			67-64-1	2.801	1.698	2.318	2.384
Acetonitrile		*	75-05-8	0.334	0.502	1.285	0.6
Acetylene			74-86-2	0.777	0.432	1.02	0.758
Acrolein		*	107-02-8	0.846	0.714	0.9	0.837
Acrylonitrile		*	107-13-1	0.002	0.0004	0.005	0.002
tert-Amyl Methyl Ether			994-05-8	0	0	0	0
Benzaldehyde			100-52-7	0.337	0.101	0.122	0.087
Benzene		*	71-43-2	0.802	0.344	0.733	0.475
Bromochloromethane			74-97-5	0.0003	0	0.0006	0.0002
Bromodichloromethane			75-27-4	0.001	0.001	0.001	0.003
Bromoform		*	75-25-2	0.014	0.011	0.018	0.015
Bromomethane	Methyl bromide	*	74-83-9	0.197	0.034	0.043	0.037
1,3-Butadiene		*	106-99-0	0.059	0.011	0.072	0.034
Butyraldehyde			123-72-8	0.331	0.13	0.219	0.136
Carbon Disulfide		*	75-15-0	0.055	0.04	0.142	0.044
Carbon Tetrachloride		*	56-23-5	0.464	0.454	0.467	0.448
Chlorobenzene		*	108-90-7	0.004	0.001	0.001	0.001
Chloroethane	Ethyl chloride	*	75-00-3	0.019	0.009	0.016	0.045
Chloroform		*	67-66-3	0.129	0.098	0.145	0.133
Chloromethane	Methyl chloride	*	74-87-3	1.021	0.983	1.028	1.019
Chloroprene	2-Chloro-1,3-butadiene	*	126-99-8	0.0001	0	0.001	0.0004
Crotonaldehyde			123-73-9	0.044	0.017	0.052	0.034
Dibromochloromethane	Chlorodibromomethane		124-48-1	0.002	0.001	0.003	0.003
1,2-Dibromoethane	Ethylene dibromide	*	106-93-4	0	0.001	0	0.0004
m-Dichlorobenzene	1,3-Dichlorobenzene		541-73-1	0.0002	0.001	0.0001	0.001
o-Dichlorobenzene	1,2-Dichlorobenzene		95-50-1	0.001	0.001	0.002	0.001
p-Dichlorobenzene	1,4-Dichlorobenzene	*	106-46-7	0.063	0.01	0.053	0.029
Dichlorodifluoromethane			75-71-8	2.564	2.497	2.522	2.494
1,1-Dichloroethane	Ethylidene dichloride	*	75-34-3	0	0.0003	0	0.0005
1,2-Dichloroethane	Ethylene dichloride	*	107-06-2	0.069	0.054	0.051	0.055
1,1-Dichloroethylene	Vinylidene chloride	*	75-35-4	0.002	0.004	0.002	0.003
cis-1,2-Dichloroethylene	cis-1,2-Dichloroethene		156-59-2	0.0001	0	0.002	0.0001
trans-1,2-Dichloroethylene	trans-1,2-Dichloroethene		156-60-5	0.009	0.003	0.022	0.063
Dichloromethane	Methylene chloride	*	75-09-2	0.575	0.467	0.647	0.674
1,2-Dichloropropane	Propylene dichloride	*	78-87-5	0.001	0.0005	0.002	0.001
cis-1,3-Dichloropropylene	cis-1,3-Dichloropropene	*	10061-01-5	0	0	0	0

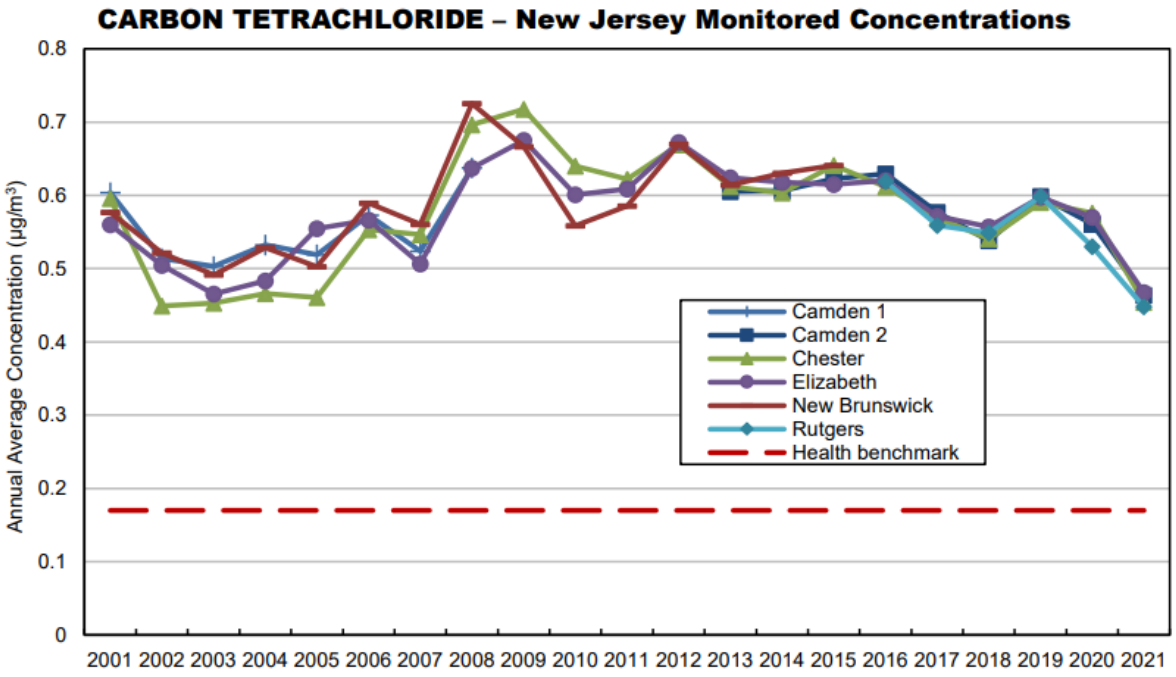
trans-1,3-Dichloropropylene	trans-1,3-Dichloropropene	*	10061-02-6	0	0	0	0
Dichlorotetrafluoroethane	Freon 114		76-14-2	0.118	0.119	0.096	0.121
Ethyl Acrylate		*	140-88-5	0	0	0	0
Ethylbenzene		*	100-41-4	0.454	0.056	0.287	0.133
Ethyl tert-Butyl Ether	tert-Butyl ethyl ether		637-92-3	0.0001	0.022	0.001	0.027
Formaldehyde		*	50-00-0	4.394	2.288	3.641	2.215
Hexachlorobutadiene	Hexachloro-1,3-butadiene	*	87-68-3	0.001	0.001	0.001	0.002
Hexaldehyde	Hexanaldehyde		66-25-1	0.214	0.12	0.231	0.154
Methyl Ethyl Ketone	MEK, 2-Butanone		78-93-3	0.361	0.202	0.328	0.45
Methyl Isobutyl Ketone	MIBK	*	108-10-1	0.162	0.069	0.176	0.13
Methyl Methacrylate		*	80-62-6	0.002	0.005	0.003	0.006
Methyl tert-Butyl Ether	MTBE	*	1634-04-4	0.001	0.002	0.005	0.003
n-Octane			111-65-9	0.314	0.039	0.28	0.115
Propionaldehyde		*	123-38-6	0.491	0.242	0.411	0.284
Propylene			115-07-1	2.281	0.712	3.331	1.059
Styrene		*	100-42-5	0.268	0.009	0.123	0.043
1,1,2,2-Tetrachloroethane		*	79-34-5	0.0001	0.001	0	0
Tetrachloroethylene	Perchloroethylene	*	127-18-4	0.165	0.048	0.115	0.082
Toluene		*	108-88-3	2.478	0.36	1.697	0.83
1,2,4-Trichlorobenzene		*	120-82-1	0.004	0.004	0.005	0.003
1,1,1-Trichloroethane	Methyl chloroform	*	71-55-6	0.012	0.01	0.014	0.012
1,1,2-Trichloroethane		*	79-00-5	0.004	0	0.001	0
Trichloroethylene		*	79-01-6	0.016	0.023	0.034	0.032
Trichlorofluoromethane			75-69-4	2.034	1.326	1.36	1.345
Trichlorotrifluoroethane	1,1,2-Trichloro-1,2,2-trifluoroethane		76-13-1	0.407	0.41	0.413	0.41
1,2,4-Trimethylbenzene			95-63-6	0.518	0.045	0.331	0.157
1,3,5-Trimethylbenzene			108-67-8	0.142	0.012	0.081	0.036
Valeraldehyde			110-62-3	0.224	0.096	0.173	0.117
Vinyl chloride		*	75-01-4	0.01	0.001	0.001	0.001
m,p-Xylene		*	108-38-3 106-42-3	1.213	0.125	0.855	0.345
o-Xylene		*	95-47-6	0.486	0.055	0.331	0.14

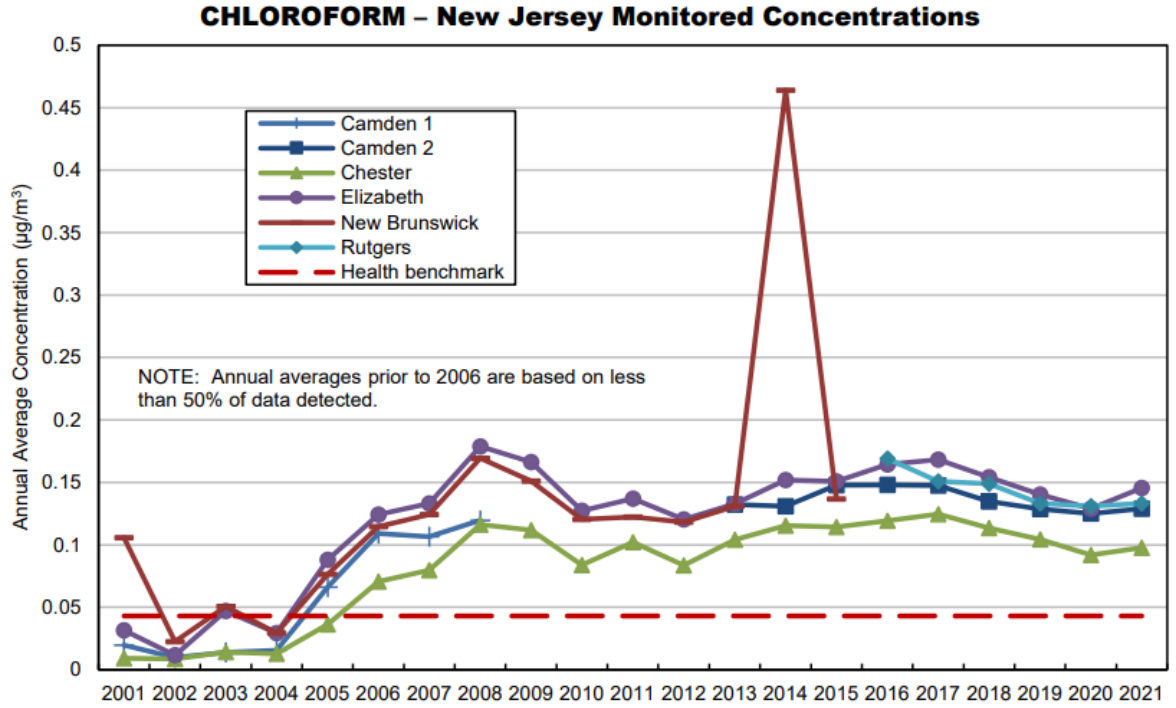

ACETALDEHYDE – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
10
9
8
7
6
5
4
3
2
1
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark

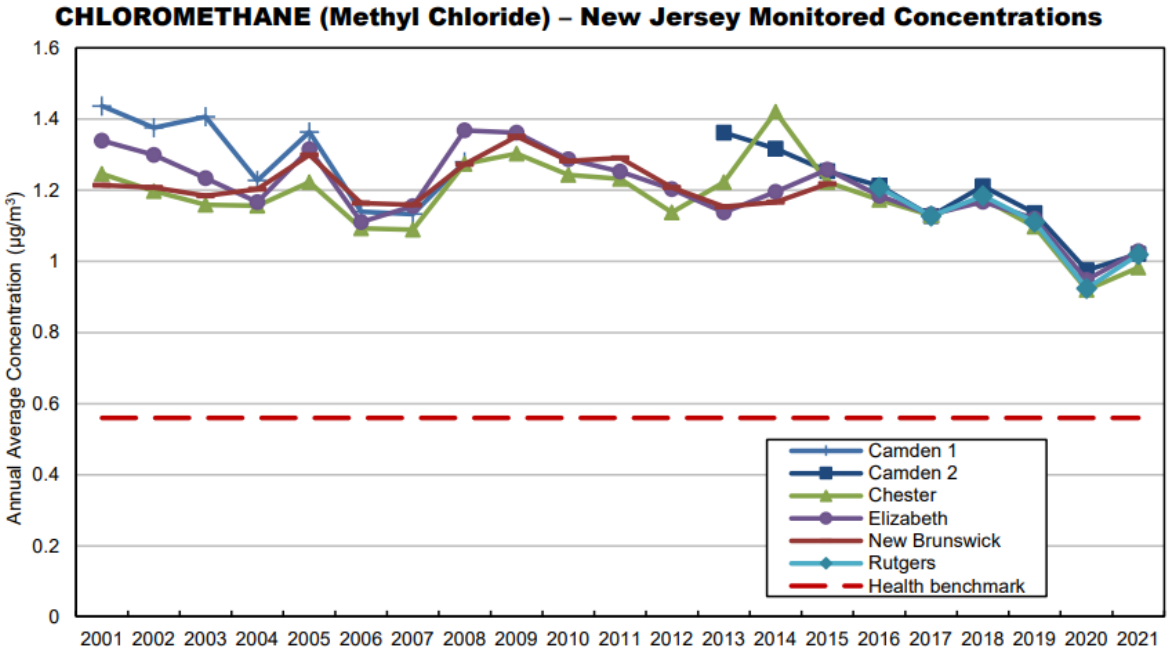

ACROLEIN – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2016
2017
2018
2019
2020
2021
Camden
Chester
Elizabeth
Rutgers
Health Benchmark

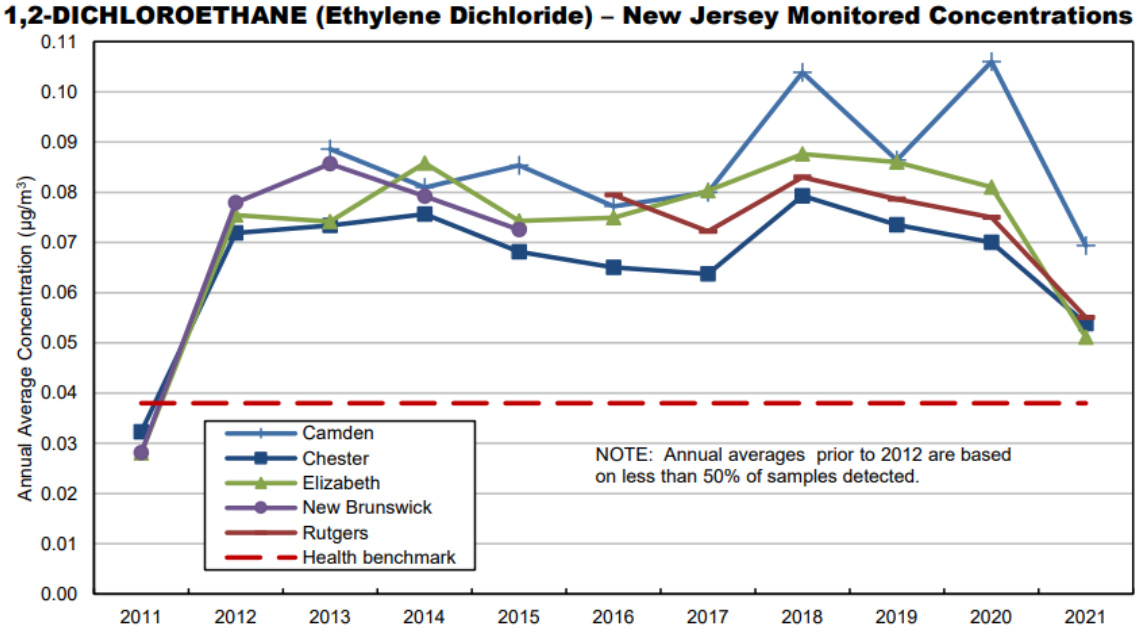

BENZENE – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark

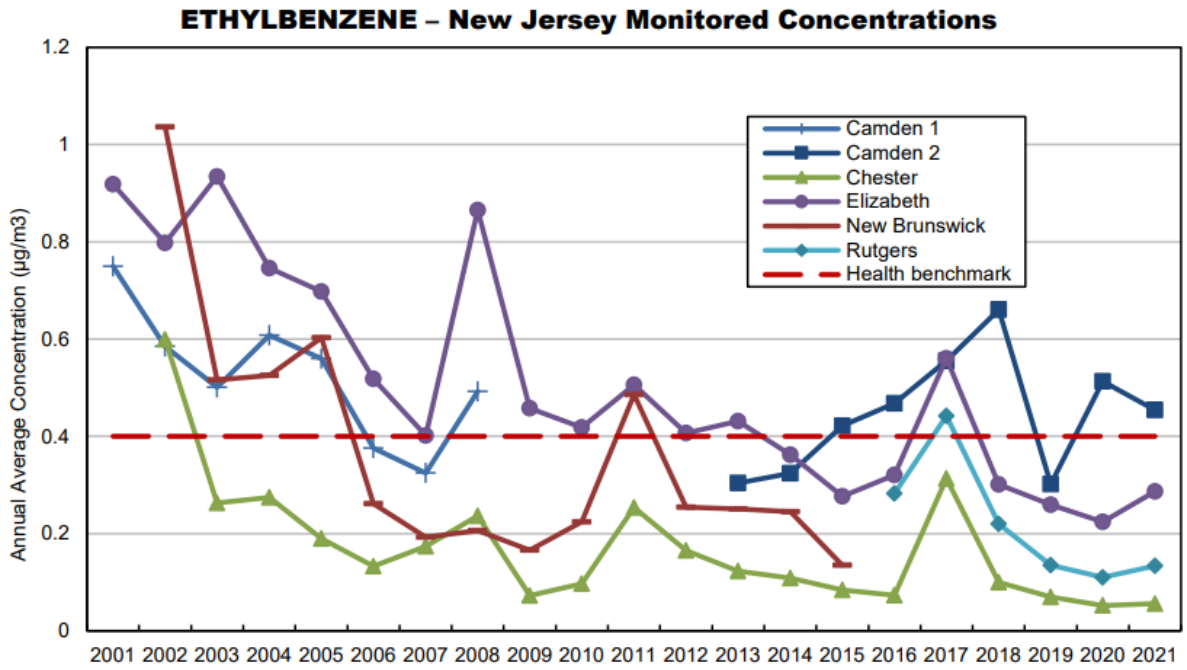

1,3-BUTADIENE – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
0.3
0.25
0.2
0.15
0.1
0.05
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark

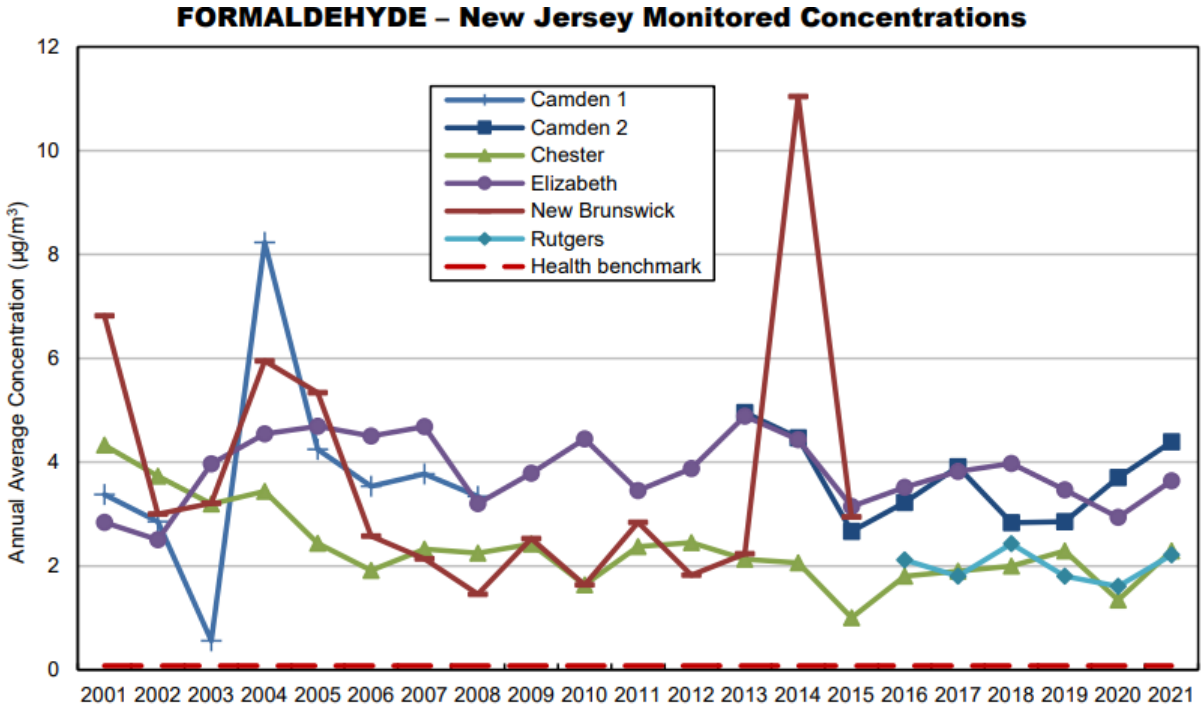

CARBON TETRACHLORIDE – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark

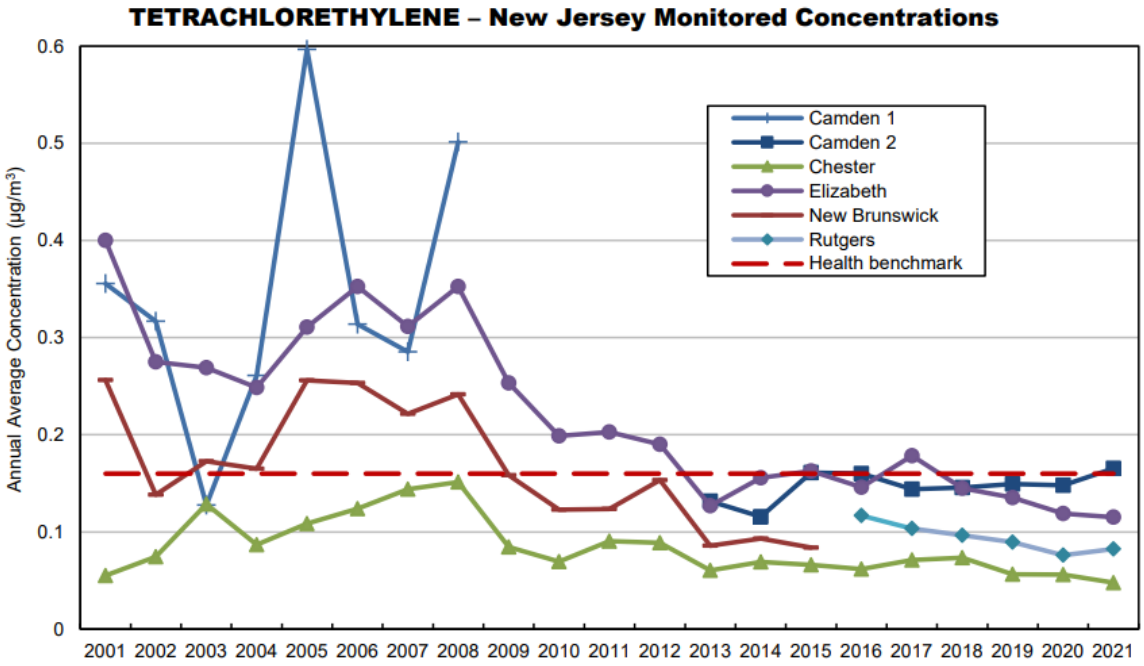

CHLOROFORM – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark
NOTE: Annual averages prior to 2006 are based on less than 50% of data detected.


CHLOROMETHANE (Methyl Chloride) – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark


1,2-DICHLOROETHANE (Ethylene Dichloride) – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark
NOTE: Annual averages prior to 2012 are based on less than 50% of samples detected.


ETHYLBENZENE – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m3)
1.2
1
0.8
0.6
0.4
0.2
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark


FORMALDEHYDE – New Jersey Monitored Concentrations
Annual Average Concentration (µg/m³)
12
10
8
6
4
2
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Camden 1
Camden 2
Chester
Elizabeth
New Brunswick
Rutgers
Health benchmark



Monitored Air Toxics with Risk Ratios Greater Than One in 2021

	Pollutant	CAS No.	Annual Average Risk Ratio			
			Camden	Chester	Elizabeth	Rutgers
1	Acetaldehyde	75-07-0	7	3	5	3
2	Acrolein	107-02-8	*42*	*36*	*45*	*42*
3	Benzene	71-43-2	6	3	6	4
4	1,3-Butadiene	106-99-0	1.8	0.3	2	1.02
5	Carbon Tetrachloride	56-23-5	3	3	3	3
6	Chloroform	67-66-3	3	2	3	3
7	Chloromethane	74-87-3	1.8	2	1.8	1.8
8	1,2-Dichloroethane	107-06-2	1.8	1.4	1.3	1.4
9	Ethylbenzene	100-41-4	1.1	0.1	0.7	0.3
10	Formaldehyde	50-00-0	57	30	47	29
11	Tetrachloroethylene	127-18-4	1.03	0.3	0.7	0.5

- Risk ratio = annual average air concentration/health benchmark

A **risk ratio** can be used to quantify risk from exposure to a specific chemical. This is calculated by dividing the annual average air concentration of a chemical by its long-term health benchmark. If the risk ratio is less than one, the air concentration should not pose a health risk. If it is greater than one, it may be of concern. The risk ratio also indicates how much higher or lower the estimated air concentration is compared to the health benchmark. Identifying problematic chemicals helps regulatory agencies focus their efforts to reduce emissions and exposure.

Pollutant	CAS No.	Detection Limit (ppbv)	Detection Limit (µg/m^3)	Health Benchmark (µg/m^3)
Acetaldehyde	75-07-0	0.017	0.031	0.45
Acetone	67-64-1	0.095	0.227	31000
Acetonitrile	75-05-8	0.053	0.088	60
Acetylene	74-86-2	0.11	0.117	
Acrolein	107-02-8	0.102	0.234	0.02
Acrylonitrile	107-13-1	0.017	0.037	0.015
tert-Amyl Methyl Ether	994-05-8	0.014	0.06	
Benzaldehyde	100-52-7	0.008	0.035	
Benzene	71-43-2	0.012	0.037	0.13
Bromochloromethane	74-97-5	0.011	0.06	40
Bromodichloromethane	75-27-4	0.009	0.063	0.027
Bromoform	75-25-2	0.014	0.141	0.91
Bromomethane	74-83-9	0.01	0.039	5
1,3-Butadiene	106-99-0	0.017	0.037	0.033
Butyraldehyde	123-72-8	0.004	0.011	
Carbon Disulfide	75-15-0	0.019	0.059	700
Carbon Tetrachloride	56-23-5	0.011	0.07	0.17
Chlorobenzene	108-90-7	0.013	0.061	1000
Chloroethane	75-00-3	0.011	0.028	10000
Chloroform	67-66-3	0.007	0.036	0.043
Chloromethane	74-87-3	0.051	0.105	0.56
Chloroprene	126-99-8	0.017	0.062	0.002
Crotonaldehyde	123-73-9	0.001	0.003	
Dibromochloromethane	124-48-1	0.014	0.142	0.037
1,2-Dibromoethane	106-93-4	0.015	0.118	0.0017
m-Dichlorobenzene	541-73-1	0.016	0.095	
o-Dichlorobenzene	95-50-1	0.017	0.099	200
p-Dichlorobenzene	106-46-7	0.015	0.09	0.091
Dichlorodifluoromethane	75-71-8	0.024	0.121	100
1,1-Dichloroethane	75-34-3	0.007	0.029	0.63
1,2-Dichloroethane	107-06-2	0.007	0.029	0.038
1,1-Dichloroethylene	75-35-4	0.009	0.035	200
cis-1,2-Dichloroethylene	156-59-2	0.017	0.068	
trans-1,2-Dichloroethylene	156-60-5	0.007	0.028	
Dichloromethane	75-09-2	0.103	0.358	77
1,2-Dichloropropane	78-87-5	0.008	0.039	0.1
cis-1,3-Dichloropropylene	10061-01-5	0.008	0.035	0.25
trans-1,3-Dichloropropylene	10061-02-6	0.016	0.072	0.25
Dichlorotetrafluoroethane	76-14-2	0.007	0.049	

Ethyl Acrylate	140-88-5	0.013	0.053	8
Ethylbenzene	100-41-4	0.009	0.041	0.4
Ethyl tert-Butyl Ether	637-92-3	0.01	0.042	
Formaldehyde	50-00-0	0.053	0.065	0.077
Hexachlorobutadiene	87-68-3	0.019	0.201	0.045
Hexaldehyde	66-25-1	0.022	0.091	
Methyl Ethyl Ketone	78-93-3	0.006	0.018	5000
Methyl Isobutyl Ketone	108-10-1	0.008	0.031	3000
Methyl Methacrylate	80-62-6	0.035	0.122	700
Methyl tert-Butyl Ether	1634-04-4	0.009	0.033	3.8
n-Octane	111-65-9	0.008	0.038	
Propionaldehyde	123-38-6	0.005	0.011	8
Propylene	115-07-1	0.13	0.224	3000
Styrene	100-42-5	0.016	0.07	1.8
1,1,2,2-Tetrachloroethane	79-34-5	0.016	0.108	0.017
Tetrachloroethylene	127-18-4	0.018	0.125	0.16
Toluene	108-88-3	0.059	0.223	3760
1,2,4-Trichlorobenzene	120-82-1	0.069	0.509	2
1,1,1-Trichloroethane	71-55-6	0.007	0.039	1000
1,1,2-Trichloroethane	79-00-5	0.011	0.059	0.063
Trichloroethylene	79-01-6	0.015	0.078	0.2
Trichlorofluoromethane	75-69-4	0.014	0.078	700
Trichlorotrifluoroethane	76-13-1	0.012	0.065	30000
1,2,4-Trimethylbenzene	95-63-6	0.013	0.063	60
1,3,5-Trimethylbenzene	108-67-8	0.015	0.074	60
Valeraldehyde	110-62-3	0.006	0.02	
Vinyl chloride	75-01-4	0.009	0.022	0.11
m,p-Xylene	108-38-3 106-42-3	0.019	0.083	100
o-Xylene	95-47-6	0.013	0.056	100

Detection limits are from ERG analytic lab, Morrisville, NC.

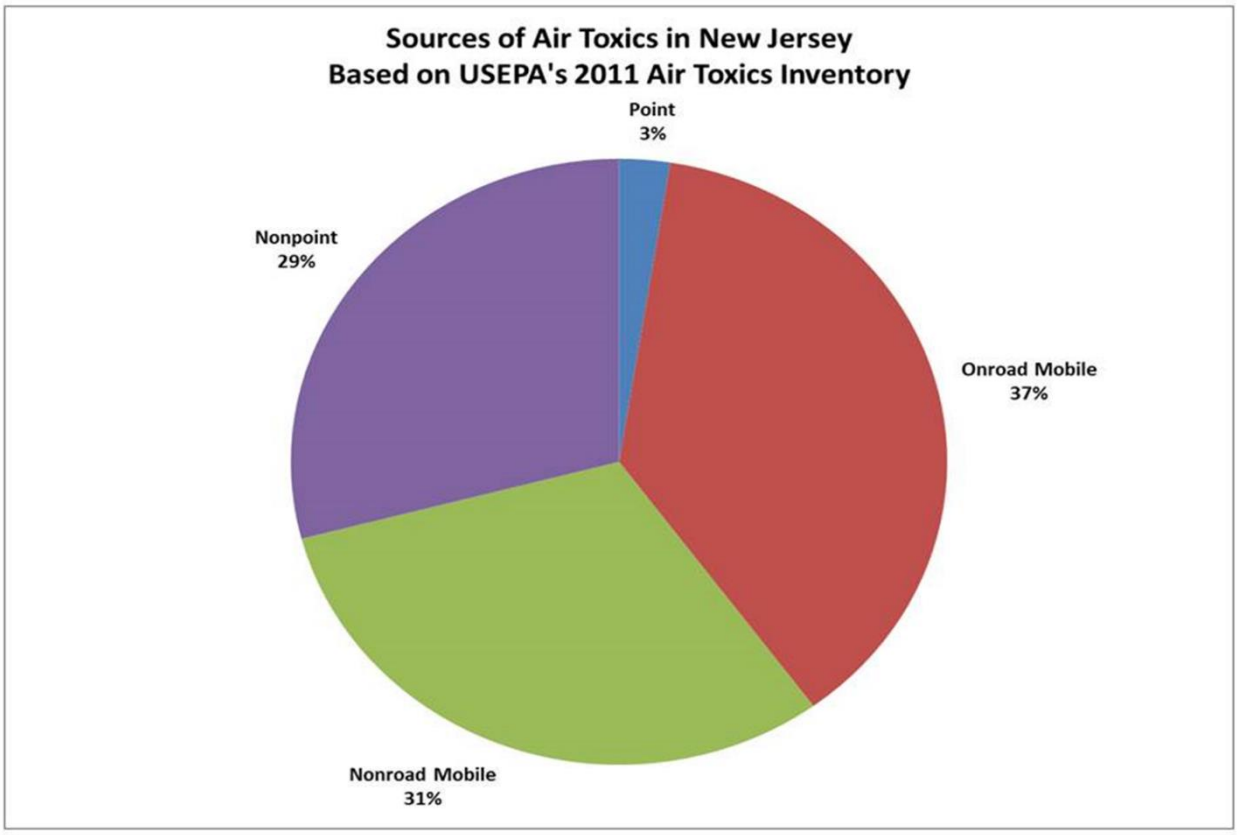
• Health benchmark - the chemical-specific air concentration above which there may be human health concerns. Not available for all chemicals. Those presented here are for long-term exposure.

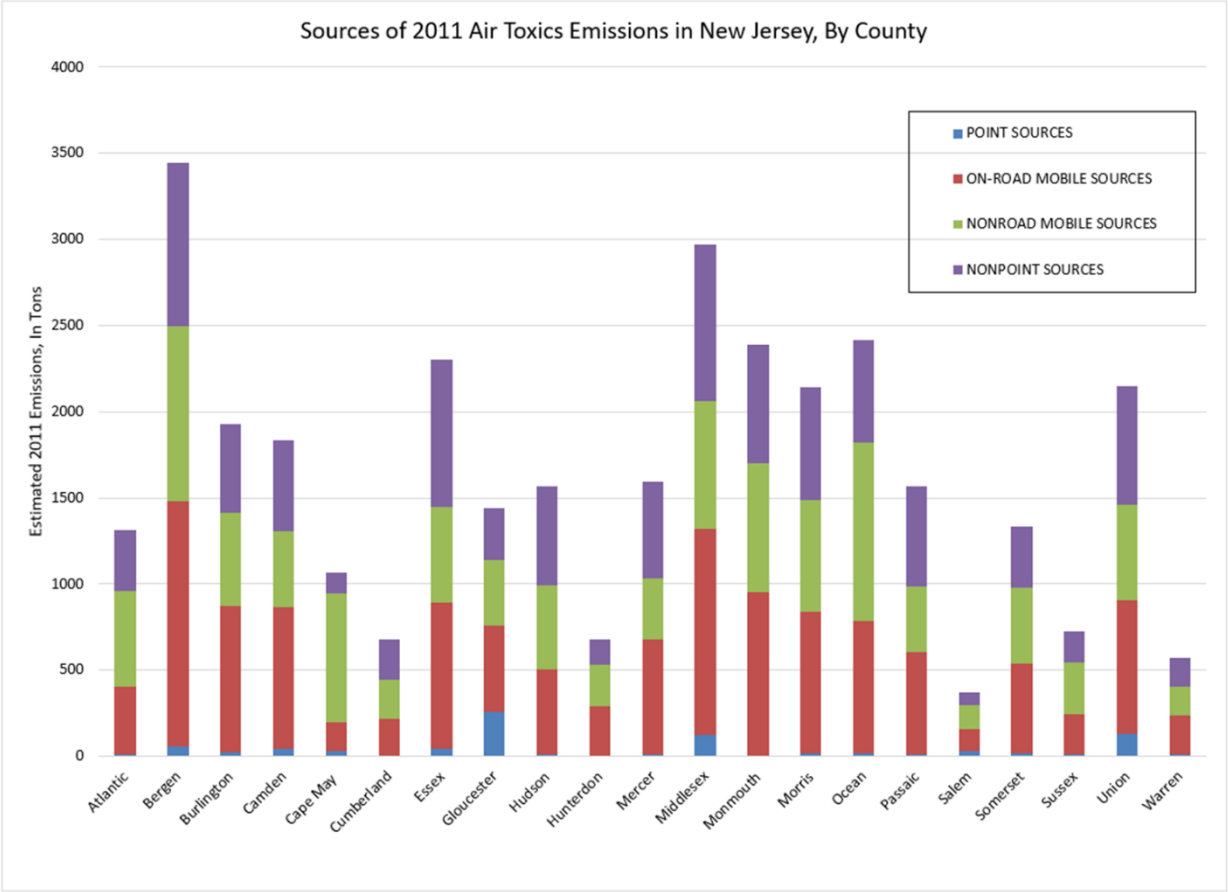
• For a carcinogen (cancer-causing chemical), the health benchmark is set at the air concentration that would cause no more than a one-in-a-million increase in the likelihood of getting cancer, even after a lifetime of exposure.

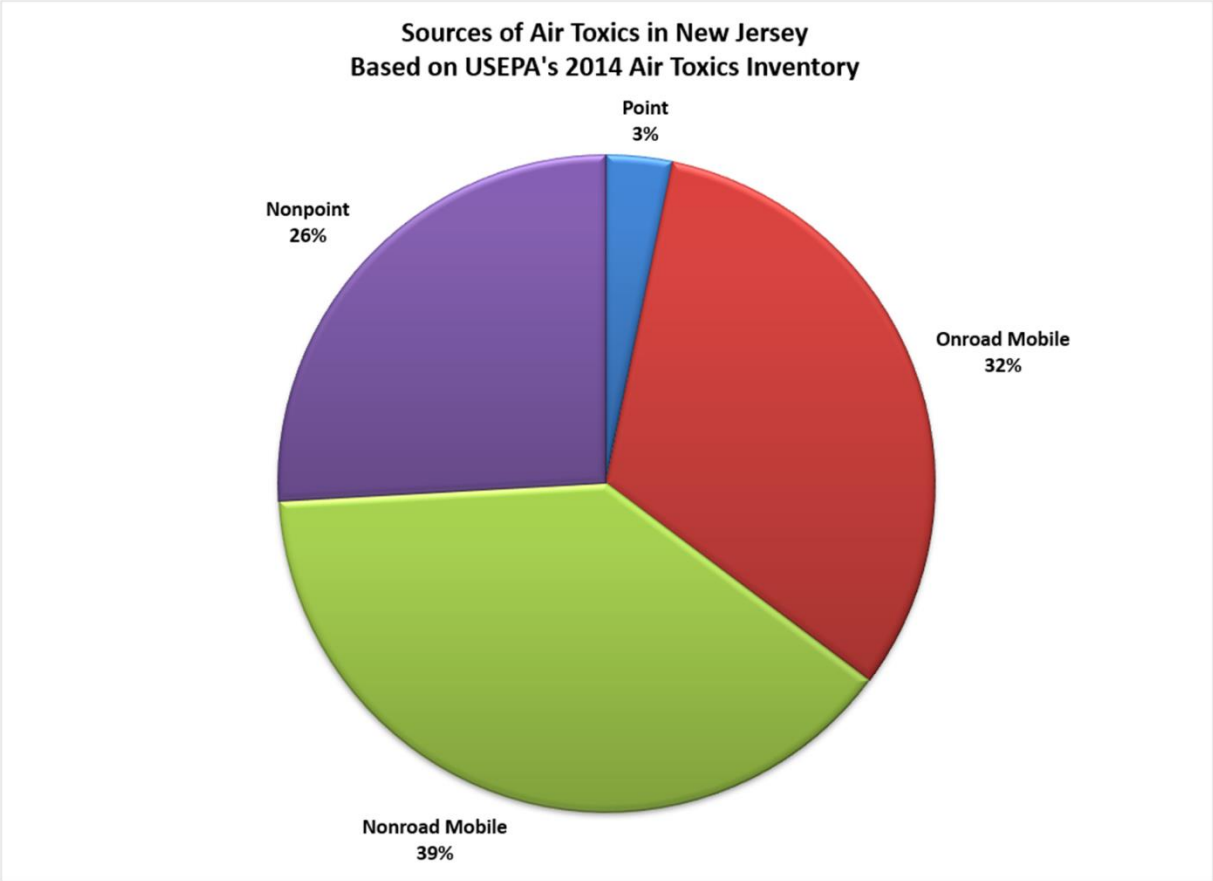
• For a noncarcinogen, the health benchmark is the maximum air concentration to which exposure is likely to cause no harm, even if that exposure occurs on a daily basis for a lifetime.

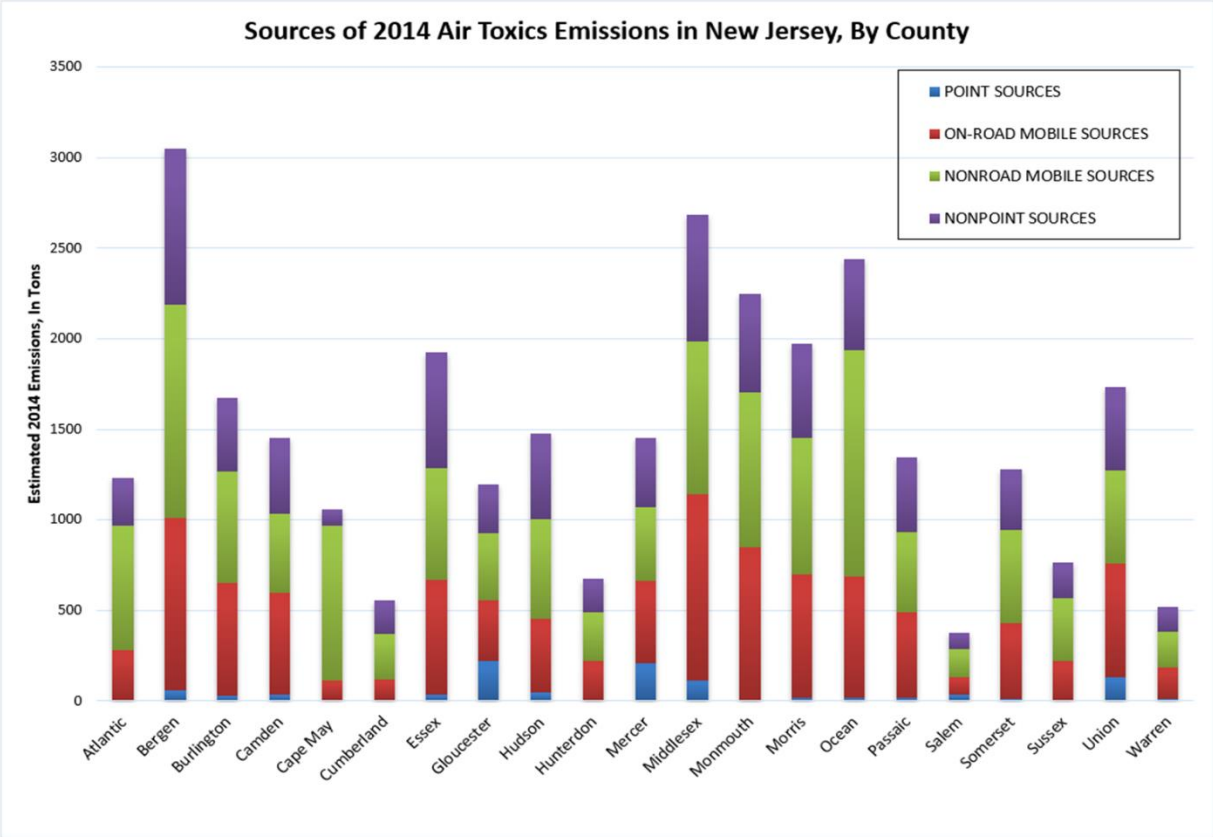
• Health benchmarks in italics are based on noncancer effects.

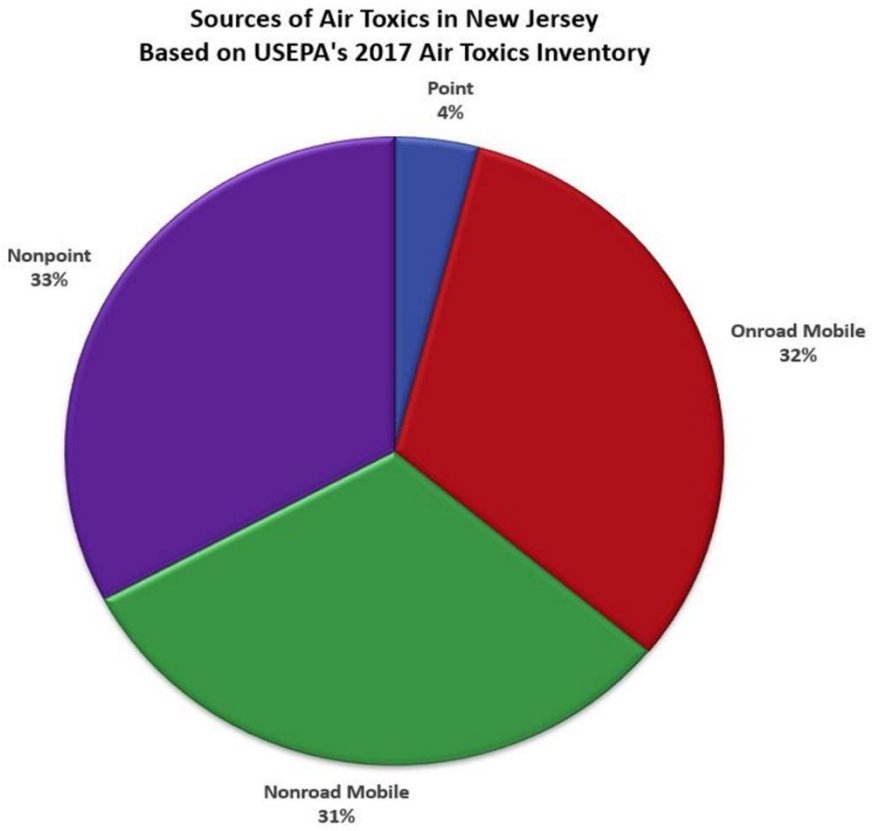
• Health benchmarks are from Toxicity Values for Inhalation Exposure, NJDEP Bureau of Evaluation & Planning, June 2020. https://www.state.nj.us/dep/aqpp/downloads/risk/ToxAll2020.pdf

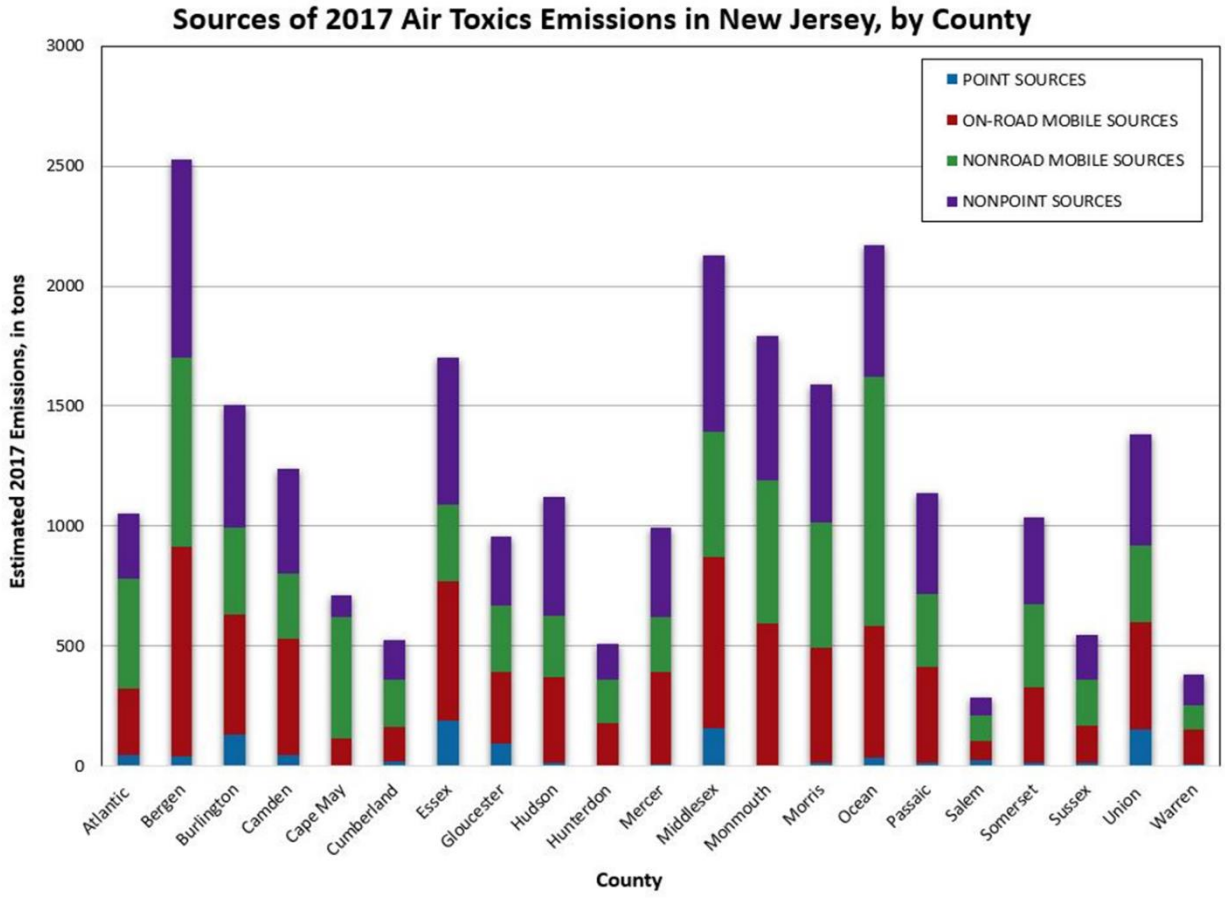

Sources of Air Toxics in New Jersey
Based on USEPA's 2011 Air Toxics Inventory
Point
3%
Onroad Mobile
37%
Nonroad Mobile
31%
Nonpoint
29%


Sources of 2011 Air Toxics Emissions in New Jersey, By County
Estimated 2011 Emissions, In Tons
4000
3500
3000
2500
2000
1500
1000
500
0
POINT SOURCES
ON-ROAD MOBILE SOURCES
NONROAD MOBILE SOURCES
NONPOINT SOURCES
Atlantic
Bergen
Burlington
Camden
Cape May
Cumberland
Essex
Gloucester
Hudson
Hunterdon
Mercer
Middlesex
Monmouth
Morris
Ocean
Passaic
Salem
Somerset
Sussex
Union
Warren

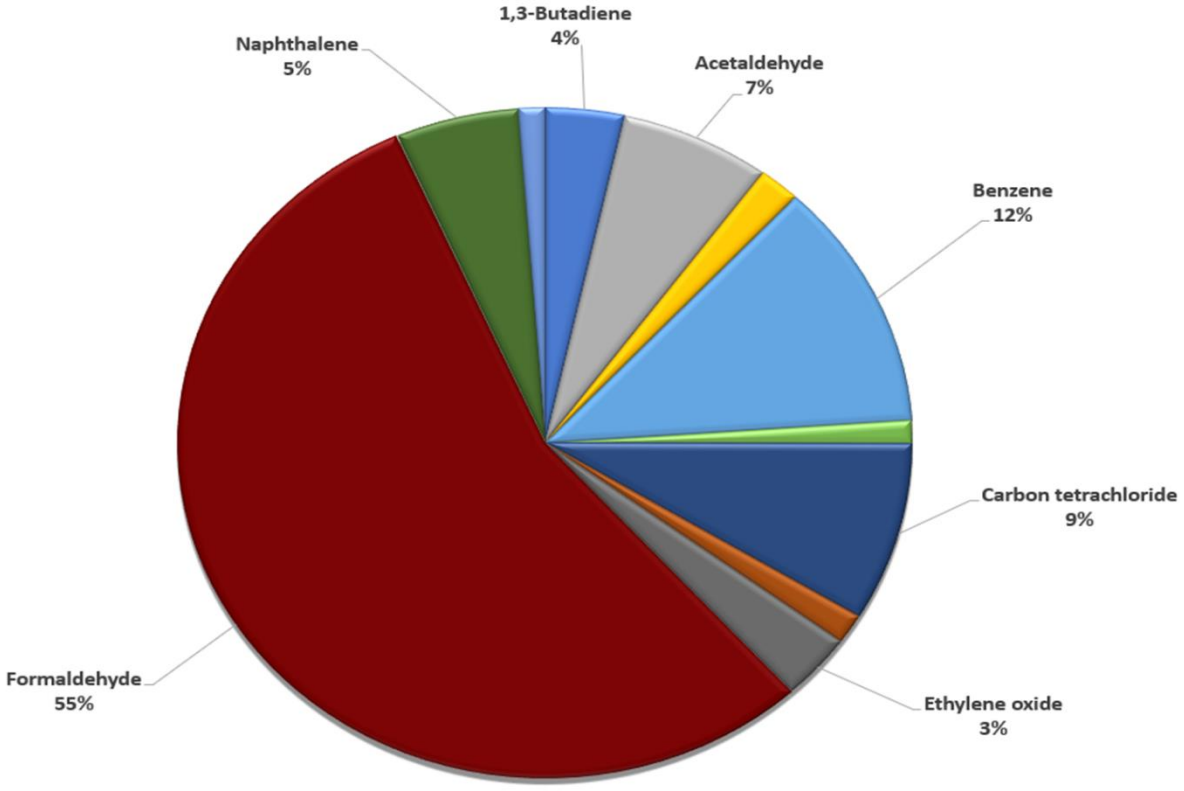

Sources of Air Toxics in New Jersey
Based on USEPA's 2014 Air Toxics Inventory
Point
3%
Onroad Mobile
32%
Nonroad Mobile
39%
Nonpoint
26%


Sources of 2014 Air Toxics Emissions in New Jersey, By County
Estimated 2014 Emissions, In Tons
3500
3000
2500
2000
1500
1000
500
0
POINT SOURCES
ON-ROAD MOBILE SOURCES
NONROAD MOBILE SOURCES
NONPOINT SOURCES
Atlantic
Bergen
Burlington
Camden
Cape May
Cumberland
Essex
Gloucester
Hudson
Hunterdon
Mercer
Middlesex
Monmouth
Morris
Ocean
Passaic
Salem
Somerset
Sussex
Union
Warren

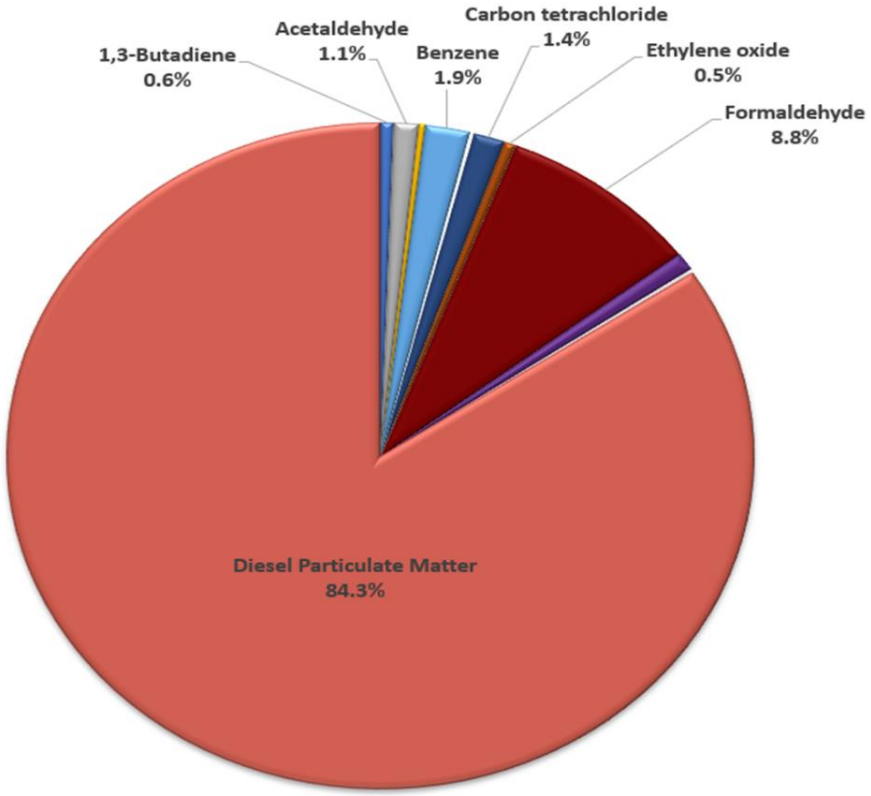

Sources of Air Toxics in New Jersey
Based on USEPA's 2017 Air Toxics Inventory
Point
4%
Onroad Mobile
32%
Nonroad Mobile
31%
Nonpoint
33%


Sources of 2017 Air Toxics Emissions in New Jersey, by County
POINT SOURCES
ON-ROAD MOBILE SOURCES
NONROAD MOBILE SOURCES
NONPOINT SOURCES
Estimated 2017 Emissions, in tons
3000
2500
2000
1500
1000
500
0
Atlantic
Bergen
Burlington
Camden
Cape May
Cumberland
Essex
Gloucester
Hudson
Hunterdon
Mercer
Middlesex
Monmouth
Morris
Ocean
Passaic
Salem
Somerset
Sussex
Union
Warren
County

2018 AirToxScreen Pollutant Contribution to Cancer Risk without Diesel



2018 AirToxScreen Pollutant Contribution to Cancer Risk for New Jersey



LIST OF ACRONYMS

CAA	-	(Federal) Clean Air Act
CAC	-	(NJ) Clean Air Council
CEHA	-	County Environmental Health Act
CEP	-	Cumulative Exposure Project
CONUS	-	Contiguous United States
CSSRP	-	Chemical Safety for Sustainability Research Program
DEP	-	(NJ) Department of Environmental Protection
DOH	-	(NJ) Department of Health
DOT	-	(NJ) Department of Transportation
DPM	-	Diesel Particulate Matter
EJ	-	Environmental Justice
EPA	-	(US) Environmental Protection Agency
EtO	-	Ethylene Oxide
FLM	-	Fence Line Monitoring
HAP	-	Hazardous Air Pollutants
HI	-	Hazard Index
HQ	-	Hazard Quotient
MACT	-	Maximum Achievable Control Technology
NAAQS	-	National Ambient Air Quality Standards
NATA	-	National Air Toxics Assessment (currently AirTox Screen)
NESCAUM	-	Northeast States for Coordinated Air Use Management
NJAC	-	New Jersey Administrative Code

NJBIA	-	New Jersey Business and Industry Association
NJDEP	-	New Jersey Department of Environmental Protection
NO_2	-	Nitrogen Dioxide
O_3	-	Ozone
PAM	-	Photochemical Assessment Monitoring
PM	-	Particulate Matter
RfC	-	Reference Concentration
SUNY	-	State University of New York
TRI	-	Toxic Release Inventory
USEPA	-	United States Environmental Protection Agency
VOC	-	Volatile Organic Compound

HISTORY OF THE CLEAN AIR COUNCIL HEARINGS

2022 Declining Trends During the Pandemic: Vehicle Miles Traveled and Air Pollutants

2021 Dust in the Wind: Just a Nuisance or Something More?

2020 Past, Present, and Future: Air Quality Around Our Ports and Airports

2019 Global Warming Pollutants in New Jersey: Beyond Carbon Dioxide

2018 Zero Emission Vehicles: Clearing the Air

2017 What Can Be Learned from Low-Cost Air Quality Monitors: Best Uses and the Current State of Technology

2016 The Clean Power Plan: Impact on New Jersey (not released)

2015 Air Pollution Knows No Bounds: Reducing Smog Regionally

2014 Reducing Air Emissions Through Alternative Transportation Strategies

2013 Addressing the Adverse Effects of Climate Change on Air Quality

2012 Transportation and Small Sources of Air Pollution: Challenges and Opportunities to Achieve Healthier Air Quality in New Jersey

2011 The Cumulative Health Impacts of Toxic Air Pollutants on Sensitive subpopulations and the General Public

2010 Vision for the Next Decade: Air Quality and Pollution Control in New Jersey

2009 Electricity Generation Alternatives for New Jersey's Future: What is the Right Mix for Improving Air Quality and Reducing Climate Change?

2008 Improving Air Quality at Our Ports & Airports—Setting an Agenda for a Cleaner Future

2007 Improving Air Quality through Energy Efficiency and Conservation: The Power of Government Policy and an Educated Public

2006 Indoor Air Quality

2005 Air Pollution—Effects on Public Health, Health Care Costs, and Health Insurance Costs

2004 Fine Particulate Matter in the Atmosphere
- Health Impacts in NJ
- Need for Control Measures

2003 Moving Transportation in the Right Direction

2002 Innovative Solutions for Clean Air

2001 Air Quality Needs Beyond 2000

2000 Air Toxics in New Jersey

1999 The Impact of Electric Utility Deregulation on New Jersey's Environment

1998 CLEAN AIR Complying with the Clean Air Act: Status, Problems, Impacts, and Strategies

1997 Particulate Matter: The proposed Standard and How it May Affect NJ

1996 Clearing the Air Communicating with the Public

1995 Strategies for Meeting Clean Air Goals

1994 Air Pollution in NJ: State Appropriations vs. Fees & Fines

1993 Enhanced Automobile Inspection and Maintenance Procedures

1992 Impact on the Public of the New Clean Air Act Requirements

1991 Air Pollution Emergencies

1990 Trucks, Buses, and Cars: Emissions and Inspections

1989 Risk Assessment – The Future of Environmental Quality

1988 The Waste Crisis, Disposal Without Air Pollution

1987 Ozone: New Jersey's Health Dilemma

1986 Indoor Air Pollution

1985 Fifteen Years of Air Pollution Control in NJ: Unanswered Questions

1984 The Effects of Resource Recovery on Air Quality

1983 The Effects of Acid Rain in NJ

1981 How Can NJ Stimulate Car and Van Pooling to Improve Air Quality?

1980 (October) Ride Sharing, Car– and Vanpooling

1979 What Are the Roles of Municipal, County, and Regional Agencies in the New Jersey Air Pollution Program?

1978 How Can NJ meet its Energy Needs While Attaining and Maintaining Air Quality Standards?

1977 How Can NJ Grow While Attaining and Maintaining Air Quality Standards?

1976 Should NJ Change its Air Pollution Regulations?

1974 Photochemical Oxidants

1973 Clean Air and Transportation Alternatives to the Automobile and Will the Environmental Impact Statement Serve to Improve Air Quality in NJ?

1972 The Environmental Impact on Air Pollution: The Relationship between Air Quality, Public Health, and Economic Growth in NJ

1971 How Citizens of NJ Can Fight Air Pollution Most Effectively with Recommendations for Action

1970 Status of Air Pollution from Mobile Sources with Recommendations for Further Action

1969 Status of Air Pollution Control in NJ, with Recommendations for Further Actions

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