

Environmental Justice Issue Brief
New York State Energy Plan 2009

December 2009

1 Overview

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.¹

Governor Paterson has directed New York agencies and authorities to consider the protection of public health and safety, the needs of vulnerable communities, and the role of environmental justice in energy-related decisions. In the context of the Energy Plan, environmental justice analysis and recommendations will focus on improving both the human and physical environment with a particular emphasis on minority and low-income communities, and addressing any disproportionately adverse environmental impacts that may exist as a result of existing or planned facilities located in those communities.

Low-income communities and communities of color have historically been overburdened as a result of air pollution from energy-generating facilities, small stationary sources, and dense traffic. For instance, studies have found that New York City residents in high asthma hospitalization areas were almost twice as likely to be African-American or Latino. Asthma hospitalization rates have also been correlated with density of air polluting facilities, density of polluting land uses and density of truck routes.²

To minimize further burdening these populations, future energy-related decisions made by state agencies and authorities must consider the environmental and health impacts agency actions will have on environmental justice communities. In an effort to develop more robust and effective environmental justice policies and programs, the State will continue to identify areas with disproportionately high rates of poverty, unemployment, and traffic, and areas with greater concentrations of polluting facilities. To determine if there is a correlation between living in overburdened communities and developing health related problems, New York will also continue to study those communities with disproportionately high rates of illnesses such as asthma, cancer, lead poisoning, and diabetes.

Reliability will always be a driving force for most energy-related decisions; however, factors such as public health, sustainability, and environmental justice must also be considered to develop balanced energy policies and programs. The stated objectives of the 2009 Energy Plan support this approach. From 2000 to 2002, New York, and specifically New York City, saw a drastic increase in energy demand with very few new electric generators coming on-line. In response to this increased demand, 11 simple cycle turbines were quickly built in low-income communities and communities of color throughout New York City and on Long Island.³ The summer demand in the Metropolitan area was also relieved by the

¹ U.S. Environmental Protection Agency (EPA). *Environmental Justice*. 2009. <http://www.epa.gov/compliance/environmentaljustice/index.html>

² See discussion in section 3.1 below.

³ *UPROSE v NYPA*. 729 N.Y.S.2d 42. (N.Y. App. Div, 2001).

temporary siting of smaller diesel generators. These facilities were built where there was existing infrastructure that could support their construction within the limited time available; with few exceptions, the sites were in low-income communities and communities of color. Most of the turbines and generators were built in urban areas and on waterfronts in neighborhoods with limited open space and waterfront access. While most burn natural gas, these units nevertheless emit tons of particulate matter, nitrogen oxide and other pollutants and are less efficient than combined cycle generators. To reduce the risk of overburdening communities of color and low income communities in the future, siting procedures should provide for thorough environmental review and effective participation of concerned stakeholders in the decision-making processes.

Statewide demand for energy will continue to increase, and there will always be some impacts and burdens caused by energy production. However, the State can help to ease the burdens on environmental justice communities by avoiding the clustering of polluting facilities to the extent practicable.

This Issue Brief summarizes key environmental justice and public health burdens and considerations of energy siting, permitting, supply development, and delivery. It also highlights potential approaches and actions that could be considered to improve the quality of life in environmental justice communities.

2 Federal and State Environmental Justice Policies

2.1 Definition of Environmental Justice

The environmental justice movement was born in the 1980s when communities of color became aware of inequitable concentrations of undesirable land uses in their communities.⁴ Environmental justice became a national issue in 1982 when approximately 500 demonstrators gathered in Warren County, North Carolina, to protest the siting of a polychlorinated biphenyl (PCB) landfill in a predominately African-American and low-income community. This protest led to several studies pertaining to environmental justice and two major environmental conferences, which further increased awareness of environmental justice issues. The First National People of Color Environmental Leadership Summit, held in October 1991 in Washington, D.C., produced the "Principles of Environmental Justice" and the "Call to Action," two foundational documents of the environmental justice movement.⁵ These two documents formed the basis of many of the environmental justice policies in place today. Their focus is two-fold: to achieve environmental equity, and to empower meaningful community participation in decision-making.

On February 11, 1994, President William Clinton signed Executive Order 12,898 addressing environmental justice concerns. This groundbreaking order directed federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs on minority populations and low-income populations. The Order also directed federal agencies to identify ways to prevent discrimination by race, color or national origin in any federally funded programs dealing with health or the environment. Executive Order 12,898 was designed to assess and address the demographic issues associated with federal actions and to improve public participation procedures.

The U.S. Environmental Protection Agency (EPA) has defined environmental justice as:

“... the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. **Fair treatment** means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. **Meaningful involvement** means that: (1) people have an opportunity to participate in decisions about activities that may affect their environment and/or health; (2) the public’s contribution can influence the regulatory agency's decision; (3) their concerns will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected.”⁶

⁴ Cole, Luke W., Foster, Sheila R. *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement*. 2001.

⁵ Bullard, Robert D. *Environmental Justice in the 21st Century*. <http://www.ejrc.cau.edu/ejinthe21century.htm>

⁶ U.S. Environmental Protection Agency (EPA). *Basic Information [about Environmental Justice]*. <http://www.epa.gov/compliance/basics/ejbackground.html>

The New York State Department of Environmental Conservation (DEC) adopted this definition in 2003 under its Commissioner Policy on Environmental Justice and Permitting.⁷ Advancing and achieving environmental justice requires identifying environmentally overburdened communities, providing for meaningful input in decision-making processes, and taking steps to reduce the burdens and increase the benefits to environmental justice communities.

2.2 New York Environmental Justice Policies and Programs

New York has identified potential environmental justice areas based on demographic information from the 2000 US Census data. The DEC developed and implemented a Commissioner Policy on Environmental Justice and Permitting (CP-29) which provides guidance for incorporating environmental justice concerns into the DEC environmental permit review process and the DEC application of the State Environmental Quality Review Act (SEQRA). Other State agencies are also beginning to incorporate environmental justice considerations as part of an interagency task force established by Governor Paterson.⁸

2.2.1 Identification of Environmental Justice Areas in New York

DEC currently classifies environmental justice areas based on location of low-income and minority populations. Potential environmental justice areas (PEJAs) are U.S. Census blocks (200 to 500 households) that, in the 2000 U.S. Census, met one or more of the following criteria:

- 51.1 percent or more of the population in an urban area reported themselves as members of minority groups.
- 33.8 percent or more of the population in a rural area reported themselves as members of minority groups.
- 23.59 percent or more of the population in an urban or rural area had incomes below the federal poverty level.

DEC has a custom Geographic Information System (GIS) application for assessment of PEJAs. GIS data analysis and mapping are important tools because they can provide information necessary to identify environmental justice communities or communities of concern. Maps can be used to visually represent the distribution of environmental hazards, health outcomes, or other factors in communities. Maps can also be used to show the spatial variations in quality of housing stock, land use and transportation patterns, and other factors.

GIS mapping work is being reviewed and expanded to identify criteria beyond demographics that will help to further refine the classification of PEJAs. For example, available data indicate that many of the communities identified as PEJAs potentially 1) have a higher density of facilities or facility pollution; 2) have high asthma rates or suffer from higher health disparities; 3) are located in non-attainment areas for Clean Air Act criteria pollutants; 4) have higher truck traffic or vehicle miles traveled (VMTs); and 5) have less open space per capita. Inclusion of other factors may be explored in the future.

⁷ DEC. *Commissioner Policy 29, Environmental Justice and Permitting*. 2003. http://www.dec.ny.gov/docs/permits_ej_operations_pdf/ejpolicy.pdf

⁸ DEC. *Environmental Justice Interagency Task Force*. 2009. <http://www.dec.ny.gov/public/47153.html>

As discussed in Chapter 3, evidence of disproportionate concentrations of certain pollutants, particularly in urban environmental justice communities, has prompted DEC, working with other state agencies, to conduct more detailed GIS analyses of these PEJAs and to develop more detailed environmental justice maps. DEC will be able to use this data in conjunction with its facility siting and permitting processes to relieve environmental strains and better serve New Yorkers who are burdened by disproportionate levels of air and water pollution.

2.2.2 Environmental Justice and Siting Procedures

CP-29 promotes the fair and meaningful involvement of all people in the DEC environmental permit process by providing public access to DEC permit information. Incorporating environmental justice concerns into DEC's permit review process enables community groups in PEJAs to more effectively participate in the environmental permit review process.

The DEC CP-29 policy applies to certain applications for major projects and major modifications for the permits authorized by the Environmental Conservation Law, including Article 19, Air Pollution Control (implemented by 6 NYCRR Part 201 et seq.). Permits authorized by delegation for sources subject to the federal requirements of Prevention of Significant Deterioration (PSD) are subject to a review process under federal regulations, and will undergo an environmental justice analysis consistent with EPA policy and guidance. Sources subject to the federal requirements of PSD will also be subject to state permits that trigger the requirements of CP-29.

The DEC screens permit applications to identify whether the proposed action is in or near a potential environmental justice area and determines whether potential adverse environmental impacts related to the proposed action are likely to affect the area. Those applications which may impact a PEJA are reviewed consistent with CP-29, requiring coordinated review of the application with other state agencies, enhanced public participation and public involvement. In those instances where there is a positive declaration as determined under SEQRA, an assessment of community character- that includes the display and evaluation of Health Outcome Data of the potential environmental justice area- is conducted. See the Health brief for a full description of the Health Outcome Data analysis. Incorporation of the CP-29 aspects in the permit review process encourages broader evaluation of environmental impacts and consideration of community concerns along with other scientific evidence available during the course of review.

2.2.3 New York Environmental Justice Interagency Task Force

Environmental justice issues and considerations transcend traditional department lines and require collaboration among agencies to ensure effective, comprehensive solutions. To that end, Governor Paterson established the Environmental Justice Interagency Task Force (Task Force) in June 2008 and charged the Task Force to develop an action plan in consultation with state agencies and authorities in order to integrate solutions to environmental justice issues into the day-to-day business of these organizations. The Task Force has held an open stakeholder process with multiple opportunities for interested advocates and community members to be involved. The Task Force has also developed processes through which input can be gathered in ways that empowers stakeholders. The Task Force also welcomed stakeholders to submit recommendations developed separately from the working group process. The information developed during this process formed the basis for the draft Task Force recommendations and the draft Agency Action Agendas. The Task Force will present final Agency Action Agendas and Statewide Policy Recommendations to Governor Paterson by late summer 2009.

2.2.4 New York Energy Proceedings

An assessment of impacts to certain environmental justice communities was commenced in the regulatory process at the Public Service Commission's (PSC) *Energy Efficiency Portfolio Standard Proceeding (EEPS)*.⁹ The proceeding has put in place utility and NYSEDA programs to help meet the State's electricity efficiency target of a 15 percent reduction in projected state-wide electricity use by 2015.

In the May 2007 Order instituting the EEPS proceeding, the PSC charged the active parties with considering environmental justice concerns in program design. Meeting with environmental justice leaders, the PSC and other interested parties in the proceeding, heard concerns about the disproportionate number of electric generation peaking units in environmental justice neighborhoods and a request that reliance on such units be studied with the goal of using demand response and energy efficiency measures to reduce this reliance. A working group was convened to consider how demand response could be integrated with energy efficiency and how these specific environmental justice concerns could be addressed. With the active participation of environmental justice community members and State agencies, specific peaking units in or adjacent to environmental justice communities, and their characteristics, have been identified.¹⁰

Recognizing the importance of pursuing demand response initiatives, particularly downstate, the PSC instituted a new proceeding in February 2009, to promote demand response measures that may reduce reliance on inefficient peaking units with high emission rates.¹¹ New York City is the focus of this initial effort. The next phase of this proceeding will produce an assessment of demand response potential through 2015 and the operation of generating units in environmental justice areas, among other issues. In assessing benefits and costs, the PSC directed Con Edison to assess the impacts on environmental justice areas that might result from reduced reliance on peak generation units. The PSC also directed Con Edison to identify a funding source for demand response programs. This ruling is expected to help identify areas of concern and will guide the implementation of clean targeted demand-side management in environmental justice communities.

2.3 Examples of Environmental Justice Principles in Other States

Eighteen states and the District of Columbia have incorporated environmental justice into the review processes of state agency decisions,¹² and thirty-one states and the District of Columbia have adopted

⁹ PSC. *Case No. 07-M-0548: Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard*. May 16, 2007. <http://documents.dps.state.ny.us/public/Common/ViewDoc.aspx?DocRefId={625676B8-D6A2-4AB9-8D53-5426AB4BDD6D}>

¹⁰ PSC. *Case No. 09-E-0115. Working Group VIII -Summary Report on Environmental Justice Turbine Analysis/Initial Assessment*. Issued on May 29, 2009. <http://documents.dps.state.ny.us/public/Common/ViewDoc.aspx?DocRefId={56849A3A-CAE5-46BC-93C6-416E7C8DE65C}>

¹¹ PSC. *Case No. 09-E-0115. Proceeding on Motion of the Commission to Consider Demand Response Initiatives*. Issued on February 17, 2009. <http://documents.dps.state.ny.us/public/Common/ViewDoc.aspx?DocRefId={1CE8543B-6AF8-4399-A45F-1783D707BE6C}>

¹² For a comprehensive survey of environmental justice statutes, regulations, and policies, see *Environmental Justice for All: A Fifty-State Survey of Legislation, Policies, and Initiatives*. As of 2004, every state with the exceptions of Idaho, Iowa, Kansas, Maine, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Vermont, and Wyoming, has some element of Environmental Justice incorporated into its legislation, policy and/or initiatives. American Bar Association. *Environmental Justice for All: A Fifty-State Survey of Legislation, Policies, and Initiatives*. 2004. <http://www.abanet.org/irr/committees/environmental/statestudy.pdf>

environmental justice considerations in statutes and Agency Action Guidelines, reflecting an increased focus on protecting the health of vulnerable populations.¹³

Incorporating environmental justice considerations into energy siting and permitting decisions is an important way for states to protect the health and the environment of disproportionately burdened communities. California offers specific examples of appropriate ways to include environmental justice considerations.¹⁴ California's Energy Commission (CEC) addresses environmental justice concerns when siting new energy sources¹⁵ and can be a model for New York. Though there is no formal statutory requirement, the CEC has been providing environmental justice-related information to applicants under the California Environmental Quality Act (CEQA) when reviewing and analyzing applications for siting power plants and related facilities.¹⁶ The Commission's approach consists of: (1) specific public outreach efforts, in conjunction with the Public Adviser's Office, to notify, inform and involve community members, including non-English speaking people; (2) analysis of the applicable demographics to determine the percentage of minority and low-income population living in the potentially affected area; and (3) assessment of the potential environmental and health impacts of the proposed project.¹⁷ According to the CEC's "Staff Approach to Environmental Justice" guidance document, when developing a potential environmental and health impact assessment, technical staff will:

- Describe the existing setting.
- Analyze "unique circumstances," if any, of the affected population.
- Analyze the project's direct, indirect and cumulative impacts.
- Assess and recommend appropriate mitigation.
- Determine whether the project creates an unavoidable significantly adverse impact on the affected population and, if so, consider whether the impact is disproportionate.¹⁸

¹³ Despite non-uniform incorporation of principles of environmental justice in the US, this report highlights the national trend towards including EJ considerations in state legislation, policy and initiatives. American Bar Association. *Environmental Justice for All: A Fifty-State Survey of Legislation, Policies, and Initiatives*. 2004. <http://www.abanet.org/irr/committees/environmental/statestudy.pdf>

¹⁴ See Section 650410.12 of the CA Government Code for the definition of environmental justice. (Cal. Pub. Res. Code § 25550). The regulations then promulgated by the California Public Utilities Commission required the development of disproportionate impact data, including census demographic information, distribution of low-income and minority populations within six (6) miles of a proposed site and identification of available health studies concerning potentially affected populations within a six-mile radius of the proposed power plant site (Cal. Code Regs. Tit. 20 § 2022(b)(4)). This code expired January 1, 2007.

¹⁵ California Energy Commission. *California Energy Commission Environmental Justice, Frequently Asked Questions*. 2008. http://www.energy.ca.gov/public_adviser/environmental_justice_faq.html

¹⁶ California Energy Commission. 2008.

¹⁷ California Energy Commission. 2008.

¹⁸ California Energy Commission. *California Energy Commission Staff Approach to Environmental Justice*. 2009.

3 Disproportionate Burdens Affecting New York’s Environmental Justice Communities

To illustrate New York’s need to work towards improving the quality of life in environmental justice communities, this section outlines some of the burdens that low income communities and communities of color may face on a daily basis. Often, environmental justice communities house power plants, substations, refineries, roadways, ports, airports, waste transfer stations, cement kilns, sewage treatment plants and other facilities that collectively release a wide range of pollutants that have a negative effect on the health of individuals living in the community and the community’s natural environment. Because of the industrial nature of these polluting facilities, their presence also contributes to higher truck traffic rates, and in many cases, lowers property values and dampens efforts toward sustainable positive economic development. Low income communities, especially in urban areas, typically have less open space or waterfront access, and limited access to other resources such as adequate health care, nutritious food and adequate housing.

Although the State alone cannot alleviate all environmental and economic burdens in environmental justice communities, it can promote individual and corporate efforts to address environmental effects polluting entities have on these areas. Energy-related burdens are one of a myriad of issues affecting these communities. In the future, environmental justice considerations must be reflected in agency actions, such as permitting and siting power plants—particularly coal and oil powered plants—that have significant environmental impacts. Because environmental justice issues touch so many other policy areas, the opportunity for comprehensive environmental justice reform is great. Clean energy jobs, urban renewal, sustainable development, environmental remediation, and economic justice are just a few of the many goals that could be promoted and accomplished when State agencies and authorities consider environmental justice issues.

The discussion and data below show that there are communities in New York that are more vulnerable to additional environmental burdens which provides a policy basis for taking a different approach to energy related decisions in these communities.

3.1 Potential Health Effects and Disparities

3.1.1 Exposure to Air Emissions, Health Effects of Air Pollution, and Potential Disparities

One of the risks associated with energy use and production is the potential for adverse health effects from air pollution resulting from the burning of carbon-based fuels. When carbon-based fuels are burned, pollutants including sulfur dioxide, oxides of nitrogen, carbon oxides, particulate matter, ozone and volatile organic compounds are released into the air. Exposure to air pollutants can cause health effects

such as respiratory and cardiovascular abnormalities,¹⁹ but the likelihood and severity of these effects depend on factors such as the amount, duration, and frequency of exposure.

In a study done in the Bronx by researchers at the New York University School of Medicine, it was found that on days when air pollution, particulate matter levels, nitrogen oxide levels, and sulfur dioxide levels were at their highest, the severity of asthma symptoms doubled among the studied individuals.²⁰ Some studies have also shown a strong correlation between air pollution and cardiovascular diseases in women.²¹ The distribution of some sources of air emissions among communities of differing socioeconomic status and ethnic/racial make-up has been studied. A number of studies that have used GIS techniques to map industrial facilities and to examine the demographics of the areas where the facilities are located, have concluded that inactive hazardous waste sites and facilities that are listed on the Toxic Release Inventory (TRI) are more likely to be located in low-income minority areas.²² Low income communities and communities of color may have greater exposure to air pollutants due to a greater presence of air emissions sources in these communities, and residents of these communities exhibit some health outcomes at greater rates.

It is difficult to know the precise source of local air pollution, and to assign with certainty, the potential health impacts exclusively caused by energy use and production alone. This is because air pollution or environmental impacts from energy-related sources cannot be separated from other sources, including industrial processes, waste transfer stations, and inactive hazardous waste sites. The relationship between adverse health impacts and facility emissions depends on the amount of emissions, the toxicity of the emitted chemicals, exposure levels and the health conditions of exposed populations. The types of chemicals emitted and their toxicity vary among different permitted facilities. Two facilities with the same amount of emissions could have different potential health impacts if the toxicity of the chemicals emitted by one facility is much lower than the toxicity from the other facility.

3.1.2 Health Disparities

Environmental justice areas in the U.S. and New York are burdened by higher rates of certain diseases and health conditions. In New York, non-Hispanic blacks have higher mortality rates from asthma, heart disease, diabetes, stroke, colorectal cancer, prostate cancer, and female breast cancer than other groups.²³ Blacks also experience higher maternal mortality, infant death, and lower birth weight rates than other groups.²⁴ Hispanics in New York have higher hospitalization rates than non-Hispanics, and higher

¹⁹ Schragger, Thomas F., *Asthma and Air Pollution*, Toxicology Source. 2009. <http://www.toxicologysource.com/scitox/asthmasoot.html>; Miller, K.A., et al., *Long-Term Exposure to Air Pollution and Incidence Of Cardiovascular Events In Women*. 356 *New Eng J Med*, (2007).

²⁰ Schragger. 2009.

²¹ Miller. 2007.

²² For a critical review of the methods and results of these studies, see Juliana Maantay, *Mapping Environmental Injustices: Pitfalls and Potential of Geographic Information Systems in Assessing Environmental Health and Equity*, 110. *ENVTL HEALTH PERSP*. 2002. <http://www.ehponline.org/members/2002/suppl-2/161-171maantay/EHP110s2p161PDF.PDF>.; Morello-Frosch, R, Pastor, M, Porras, C, Sadd, *Environmental Justice and Regional Inequality in Southern California: Implications for Future Research*. *Environ Health Pers* 110 (Suppl. 2):149-154, 2002.

²³ Department of Health (DOH). *New York State Minority Health Surveillance Report*. 2007. http://www.health.state.ny.us/statistics/community/minority/docs/surveillance_report_2007.pdf. The report uses the following ethnicity groupings - Black non-hispanic and White non-hispanic.

²⁴ DOH. 2007.

asthma mortality rates than non-Hispanic whites.²⁵ Nationally, current asthma prevalence rates are higher among people with household income below the federal poverty threshold than among those with higher household incomes.²⁶ Income disparities are also associated with differences in the occurrence of elevated blood lead levels, low birth weight, and heart disease.²⁷

These health disparities are thought to result largely from the complex interaction of economics, as well as biological, behavioral, and environmental factors. For example poor nutrition, limited access to health care and substandard housing conditions may make impoverished children less resilient to toxins present in the natural environment.²⁸ Higher incomes permit increased access to medical care, enable people to afford better housing and live in safer neighborhoods, and increase the opportunity to engage in health promoting behaviors.

3.1.3 Asthma Disparities

Asthma disproportionately affects low-income communities and communities of color. Between 2003 and 2005, the age-adjusted asthma death rate among non-Hispanic Black New Yorkers and Hispanic New Yorkers was more than 4.6 times higher and 3.8 times higher, respectively, than that among non-Hispanic White New Yorkers.²⁹ Asthma hospitalization rates vary geographically across New York, with New York City having the highest asthma hospitalization rate among the regions of the State.³⁰ In low income ZIP codes in New York City, asthma hospitalization rates are higher than in high income ZIP codes.³¹ Asthma hospitalization rates for ZIP codes in New York are available at the DOH public web site: <http://www.health.state.ny.us/diseases/asthma/index.htm>.³²

²⁵ DOH. *New York State Asthma Surveillance Summary Report*. 2007.

http://www.health.state.ny.us/statistics/ny_asthma/pdf/2007_asthma_surveillance_summary_report.pdf

²⁶ National Surveillance for Asthma – United States, 1980-2004. U.S. *Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Reports Vol. 56, no. SS-8*. 2007. <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5608a1.htm>

²⁷ U.S. Department of Health and Human Services. *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: U.S. Government Printing Office, November 2000. <http://www.healthypeople.gov/Document/pdf/uih/uih.pdf>

²⁸ L. Bruce Hill & Martha Keating. *Children at Risk: How Air Pollution from Power Plants Threatens the Health of America's Children*. 2002. www.catf.us/publications/reports/Children_at_Risk.pdf

²⁹ DOH. *New York State Asthma Surveillance Summary Report*. 2007.

³⁰ DOH. *Information on Asthma in New York State*. 2009. http://www.health.state.ny.us/statistics/ny_asthma/index.htm

³¹ Department of Health and Mental Hygiene. *2000-2007 Asthma Hospitalization Tables and Figures*. 2009. <http://www.nyc.gov/html/doh/downloads/pdf/asthma/asthma-hospit07.pdf>

³² See the Health and Electricity Production and Energy Use Issue Brief for a detailed discussion of the effects of various pollutants on health outcomes.

In Appendix A, maps of asthma hospitalization discharge rates³³ and PEJAs are shown for the Bronx, Brooklyn, and Albany, Erie and Cattaraugus counties as examples of depicting PEJAs in relation to other factors. The five counties selected differ in land use. Brooklyn and the Bronx are very urban; Albany and Erie counties are a mixture of urban, suburban, and rural areas; and Cattaraugus County incorporates two small cities but is otherwise predominately rural. There does not appear to be a consistent pattern between asthma hospitalization rates and PEJAs. In some cases there is considerable overlap between PEJAs and areas with the highest asthma hospitalization rates, and in other cases there is not. Research is continuing to further assess the relationships between environmental factors and asthma.

A study of asthma hospitalizations in the Bronx identified the location of TRI facilities and major stationary point sources of air emissions (including power plants, major housing complexes, medical centers, and industries that emit criteria pollutants or listed hazardous air pollutants), as well as major industrial zones, limited access highways, and truck routes.³⁴ Using GIS techniques, buffer zones were constructed around these sources of air emissions. It was found that the residents within the buffers were more likely to be hospitalized for asthma than those living outside the buffers, and also were more likely to have low-income, minority status. An extension of this analysis which included actual emissions information from major stationary air pollution sources in the Bronx (rather than simply proximity) found similar associations between living where modeled emission levels were highest and higher asthma hospitalization rates.³⁵

Another study of asthma hospitalization identified four neighborhoods in New York City with consistently elevated asthma hospitalization rates in children.³⁶ The demographic and housing characteristics of the neighborhoods were assessed, and an “environmental load profile” was created from information on locations of TRI facilities, stationary polluting facilities, municipal waste transfer stations, density of truck routes, and information on land zoned for manufacturing or industry. The same assessments were done for areas outside of the high asthma hospitalization areas. The study found that residents of the high asthma hospitalization areas were almost twice as likely to be African-American or Latino than are residents living outside of these areas. The study also found that asthma hospitalization rates were correlated with the percentage of dilapidated or deteriorated housing, density of air polluting facilities, density of polluting land uses, and density of truck routes.

The relationship between ambient air quality and asthma has also been studied. A study of asthma emergency room visits and ambient air quality in New York City found that air quality based on the regional air monitoring network did not differ substantially between an area of the South Bronx and an

³³ DOH hospital discharge data were used to create ZIP code level data for asthma hospital discharges with a principal diagnosis of asthma. Population estimates by ZIP code were obtained by DOS from the Claritas Corporation. Data are available for the three-year period 2005-2007. ZIP code rates per 10,000 population were calculated by dividing the total number of asthma hospital discharges for the three year period by three to get the average number of asthma hospital discharges per year. The average number of asthma hospital discharges was then divided by the population of the middle year (2006) and multiplied by 10,000. Data for a ZIP code that crosses county boundaries are allocated to one county only (the county that contains the largest geographic portion of that ZIP code). County maps display ZIP code level data geographically by quartile. Regional quartiles were calculated separately for the five boroughs (counties) of NYC and the remaining counties of the state. A ZIP codes color indicates the regional quartile it belongs to. A non shaded area indicates that part of that ZIP code predominantly lies in an adjacent county. Rates that are based on less than or equal to 10 discharges (Relative Standard Error [RSE] >30%) are considered unstable. ZIP codes with unstable rates are marked with a plus (+).

³⁴ Maantay, J, Tu, J, & Maroko, A. *Loose-Coupling an Air Dispersion Model and a Geographic Information System (GIS) for Studying Air Pollution and Asthma in the Bronx, New York City*. 19 Int J Environ Health Res. 2009.

³⁵ Maantay et al. 2009.

³⁶ Corburn, J, Osleeb, J, Porter, M. *Urban Asthma and the Neighborhood Environment in New York City*. 12 Heath & Place. 2006.

area of lower Manhattan. However, daily variation in asthma emergency room visits were significantly associated with daily variation in several ambient air pollutants (fine particles, ozone, sulfur dioxide, nitrogen oxides) in the Bronx, but not in Manhattan.³⁷ These results suggest that other factors can modify the effect of general air quality on asthma exacerbations. Some possible factors could include access to preventive asthma medical care, nutrition, housing and proximity to local pollution sources.

Some studies have analyzed respiratory health effects in relation to long term residence in areas with differing average levels of ambient particulate matter. Long term elevated ambient exposure to particulates is associated with reduced lung function growth in children and constitutes a risk factor for premature respiratory morbidity during later life.³⁸ Infants living in areas with high levels of particulate matter (PM) “during their first two months of life had a mortality rate ten percent higher than infants living in the city with the cleanest air.”³⁹ Energy generators as well as fossil-fueled power plants and most diesel-powered transportation sources are major sources of PM pollution. These problems may be aggravated in those environmental justice communities with higher than average levels of air contaminants along with a general increase in exposure to pollution sources, reduced access to healthcare, and limited ability to move away from environmental hazards.

In studies utilizing GIS techniques, different types of facilities that emit air contaminants are grouped together so that it is not possible to look specifically at the contribution of power plants and other sources of electricity generation. While other factors that may influence the rate of asthma hospitalization (such as access to and type of medical care and use of maintenance medication) are not taken into account, these studies do contribute information on the disproportionate presence of sources of air emissions in low income and minority communities and the potential for greater exposure to air pollutants.

3.2 Densities of Facilities with Environmental Permits

Compiling data and enhancing GIS mapping are tools to help locate industrial facilities which may contribute to poor health and other burdens in environmental justice communities. For instance, data on electric generating facilities across New York that burn fossil fuel, landfill gas, solid waste or wood reveal a total of 102 combustion-based electric generating facilities throughout the State. Each of these facilities operates under a Title V permit, a federally required permit for major air emission sources.⁴⁰ Of the 102 facilities, many of them are located in or near PEJAs even though PEJAs only constitute 3.1 percent of the land area in New York State. Sixty four of the power generating facilities, or 63 percent, are located within one mile of a PEJA (the distance or area usually used when conducting an environmental and health assessment); 53 of the facilities (52 percent) are located within 0.5 mile of a PEJA; and 30 of the facilities (29 percent) are located within the boundaries of a PEJA. These data highlight the tendency of

³⁷ NYSERDA. *A Study of Ambient Air Contaminants and Asthma in New York City Final Report 06-02*. 2006. http://www.nyserda.org/publications/Report%2006_02_web.pdf

³⁸ EPA. *EPA/600/P-99/002bf: Air Quality Criteria Document for Particulate Matter*. . 2004. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=87903>

³⁹ L. Bruce Hill & Martha Keating. *Children at Risk: How Air Pollution from Power Plants Threatens the Health of America's Children* 3. 2002. www.catf.us/publications/reports/Children_at_Risk.pdf

⁴⁰ Under the federal Clean Air Act, the minimum emission thresholds for Title V permits are 25 tons/year of NOx or volatile organic carbons (VOC) in the New York City metro area; 100 tons/yr of NOx, or 50 tons/yr of VOC in the rest of the State; 100 tons/year of PM, SO₂, NO₂, or CO; 5 tons/year of lead; 10 tons per year of any other single hazardous air pollutant (HAP); or 25 tons/year of any combination of HAPs. See 6 NYCRR §201-2.1(b)(21). Cf. 6 NYCRR §201-6.1; DEC. *Air Facility Permits and Registrations*. 2009. <http://www.dec.ny.gov/chemical/8569.html>

these facilities to be in or near PEJAs, but are too limited to be used to draw conclusions about environmental or health risks of particular facilities without additional information. Aspects of assessing impacts from facility densities in relation to PEJAs are further discussed in this section.

The maximum air pollutant impacts of primary emissions from large power plants occur beyond the immediate vicinity of the facility due to their relatively tall stacks; that is, at distances beyond 0.5 mile or more away. On the other hand, the maximum air pollutant impacts of smaller, low level sources such as backup generators or peaking turbines occur in close proximity of these sources because of the lower stacks or adjacent structure influences on the stack plumes. This pattern has been consistently observed for essentially all facilities modeled over at least the last two decades, including facilities modeled more recently in Public Service Law Article X proceedings having relatively lower emissions from burning natural gas.

A certain level of environmental justice analysis was done in several Article X cases that were located in PEJAs, with the community of concern (COC) being initially defined within about 1 mile radius around the facility location. In these analyses, COCs had to be further re-defined outside this close proximity distance in order to capture the area of maximum impacts from the power plant, but generally within 3 miles of the facility. While this modeling was done for the permitting of new facilities, the results will be similar in regard to the location of the maximum air pollution impact areas for existing facilities. GIS data can help map these types of energy sources and then other demographic and health data can be added to the GIS maps to identify communities of concern.

As discussed above, several studies have demonstrated correlations between locations of polluting facilities and low-income communities and communities of color. The Natural Resources Defense Council (NRDC) in 2004 reported on the adverse impact of a variety of urban environmental dangers facing U.S. Latino populations, including air pollution emissions from power plants.⁴¹ The NRDC report discussed a study that found that Latino children have the highest asthma rate of any ethnic group in the South Bronx area. Regional air quality and localized air pollution sources both have potential to influence asthma morbidity. On a regional basis, the entire Metropolitan Area is out of attainment with federal air quality standards for PM and ozone. On a more local level, DEC's draft facility density GIS maps, Figures 1-5 below, indicate that some low income communities and communities of color have a greater density of air pollution sources than other communities, which may result in greater exposure to air pollutants.

One way to examine the distribution of potential environmental and health burdens is by mapping the relative densities, i.e. number per square mile, of facilities in different locations that are permitted by DEC. The most important consideration when mapping the densities of permitted facilities is deciding which facilities to use. DEC issues over 20 different types of permits for a wide variety of activities; however, only some of these activities are types that may cause long-term local environmental impacts. These include air emissions; discharges to surface water and groundwater; transportation, storage, management and disposal of solid or hazardous waste; and many other types of activities. Even among facilities with the same type of permit, there are differences that can affect the potential impact to a community such as the chemical composition of pollutants released, dispersion patterns of emissions, or whether emissions occur daily or only for short periods each year. The amount of emissions can also vary substantially for different facilities permitted under the same DEC program. For example, under the air program there are three different levels of permitting based in large part on the amount of emissions expected from a facility. Title V permits cover facilities that are considered to be major air emission

⁴¹ NRDC. *Hidden Danger: Environmental Health Threats in the Latino Community*. 2004. http://www.nrdc.org/health/effects/latino/english/latino_en.pdf

sources such as large power plants. Air State Facility permits cover facilities such as factories with significant emissions potential, but less than Title V facilities.⁴² Air Registrations cover many smaller facilities such as gas stations, auto body shops and dry cleaners.⁴³ State Pollutant Discharge Elimination System (SPDES) permits for water pollution discharges are similarly divided into industrial, municipal, residential, institutional, commercial and stormwater discharges to either surface or ground water.

To create the maps of facility densities shown in Figures 1-5, DEC included facilities that are in the Regulated Facilities GIS database that have been issued the following types of permits:

- Air Title V
- Air State Facility
- Air facility registration
- Industrial and municipal SPDES
- Radiation control
- Hazardous waste operations
- Solid waste management and disposal
- Mined land reclamation

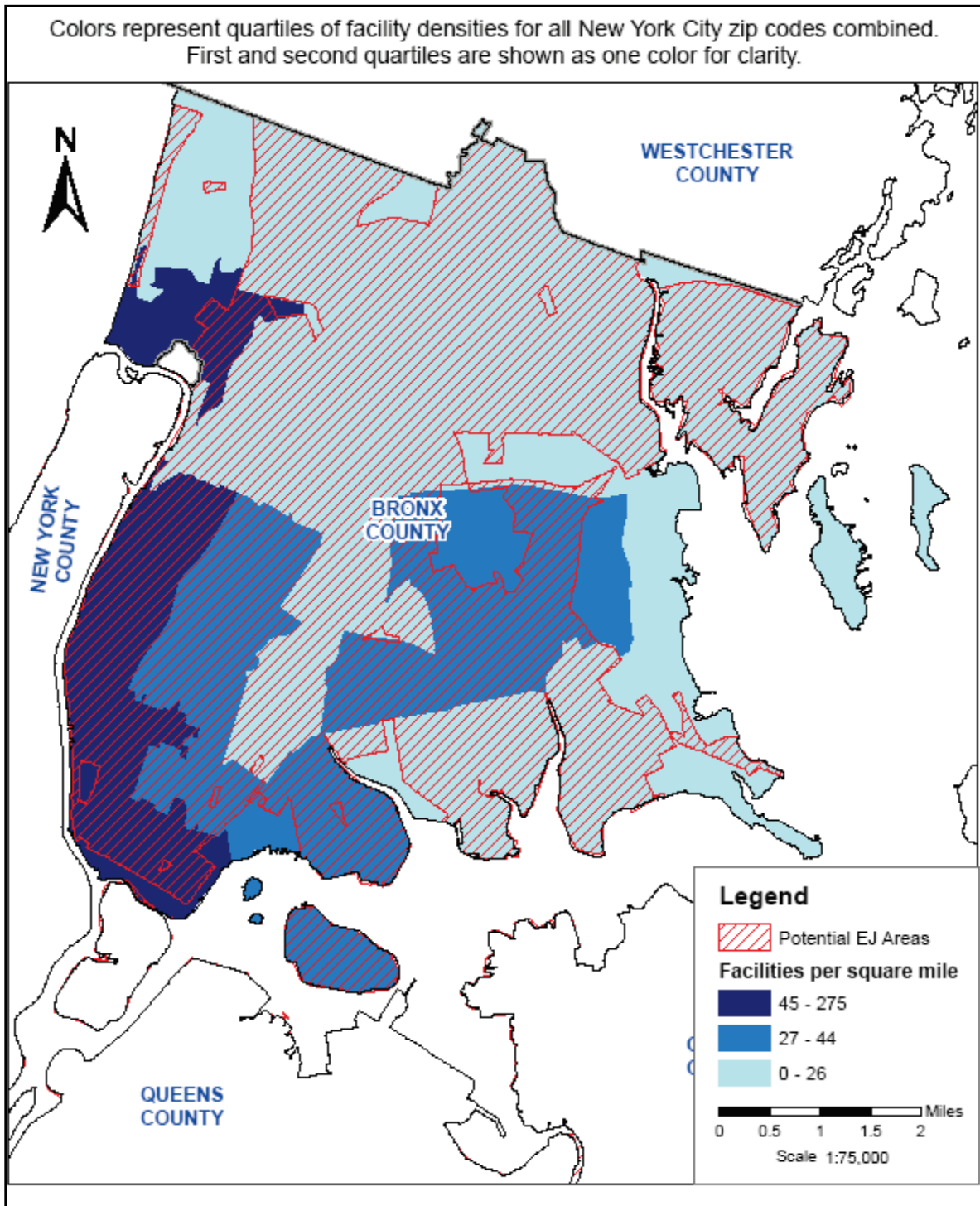
Facilities with Air Registrations were screened to remove schools and residential buildings and the remaining registered facilities were included in the analysis. The facilities were then divided into the nine DEC regions according to their DEC identification numbers. A GIS map of New York ZIP codes was used as a base map for consistency with the DOH maps of asthma hospital discharge rates, and a spatial join tool in ESRI ArcMap 9.2 was used to count the number of facilities in each ZIP code, the area (in square miles) of each ZIP code, and the number of facilities per square mile (facility density) for each ZIP code. The ZIP codes were then ranked according to facility density in two groups: (1) ZIP codes within the five boroughs of New York City; and (2) ZIP codes in the rest of the state outside of New York City. Facility densities in New York City were ranked separately from the rest of the state because the extremely high population and development density of New York City would skew the rankings to an extent that cities in other parts of the state might not show high facility densities relative to their surrounding areas.

Five counties were selected to use as examples of how GIS could be used to display facility densities to represent the range of land use in New York from dense urban to suburban to rural towns--these are Bronx, Kings, Albany, Erie and Cattaraugus Counties. Examination of these counties indicates that there could be disparities in the distribution of permitted facilities within various parts of the state. Bronx and Kings Counties have some of the highest facility densities in New York City, yet the maps show that the facilities are not evenly distributed across these boroughs. The maps of Albany and Erie Counties, which have densely populated industrial cities surrounded by large suburban and rural areas, could indicate that facilities are more likely to be located in urban areas than in the suburban or rural locations. Further analysis will be needed to determine the extent to which polluting facilities are clustered in certain locations and to pinpoint the factors that have contributed to these results.

⁴² The minimum emission thresholds for Air State Facility permits are 50 percent of the emission amounts established for Title V permits. 6 NYCRR §201-2.1(b)(21). *Cf.* 6 NYCRR Part 201-5.1; DEC. *Air Facility Permits and Registrations*. 2009. <http://www.dec.ny.gov/chemical/8569.html>

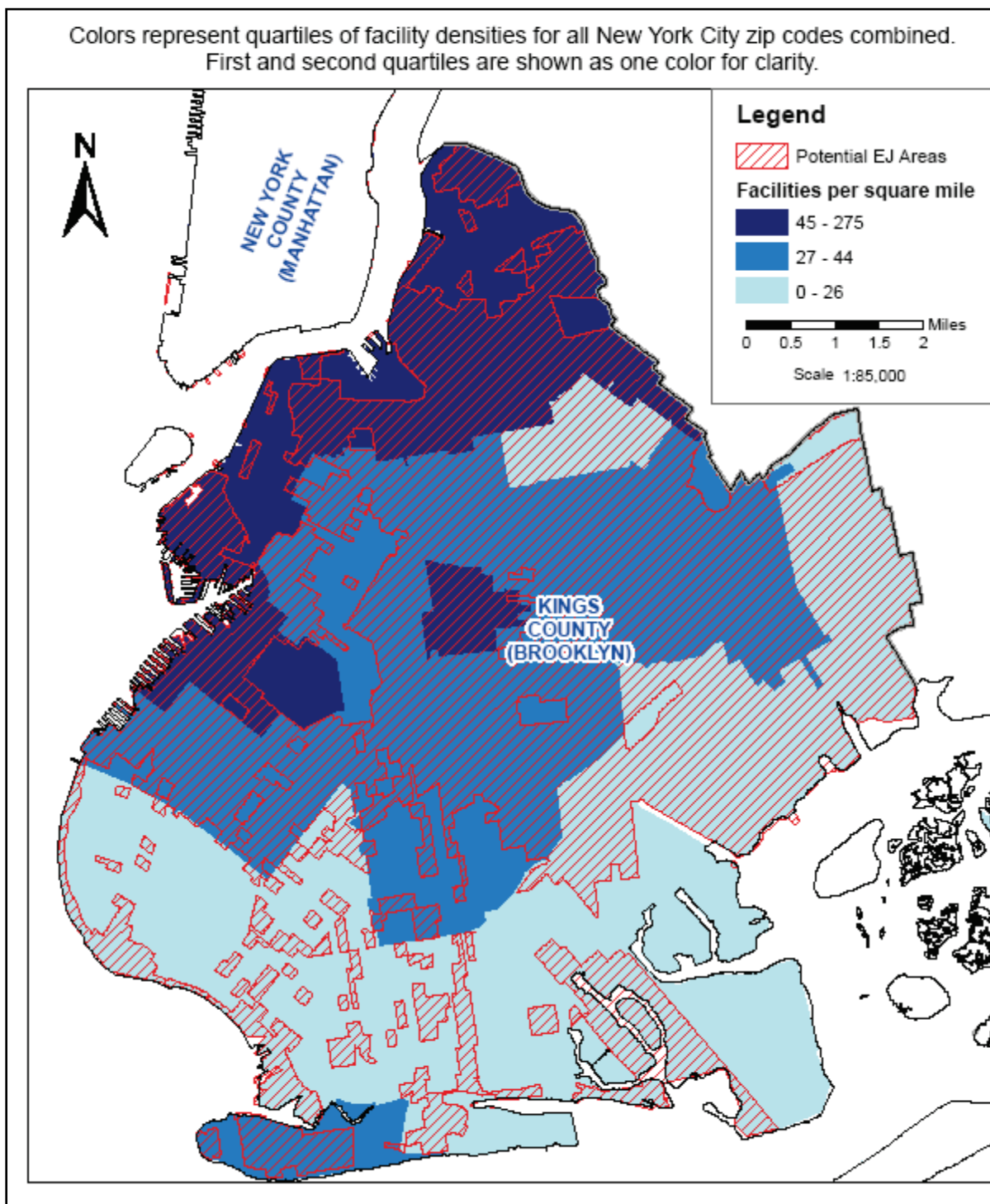
⁴³ 6 NYCRR §201-4.1; *cf.* NYSDEC, NYCRR § 201-4: *Minor Facility Registrations*. 2009. <http://www.dec.ny.gov/chemical/8569.html>

Figure 1. Potential Environmental Justice Areas and Relative Densities of Polluting Facilities Per Square Mile in Bronx Zip Codes



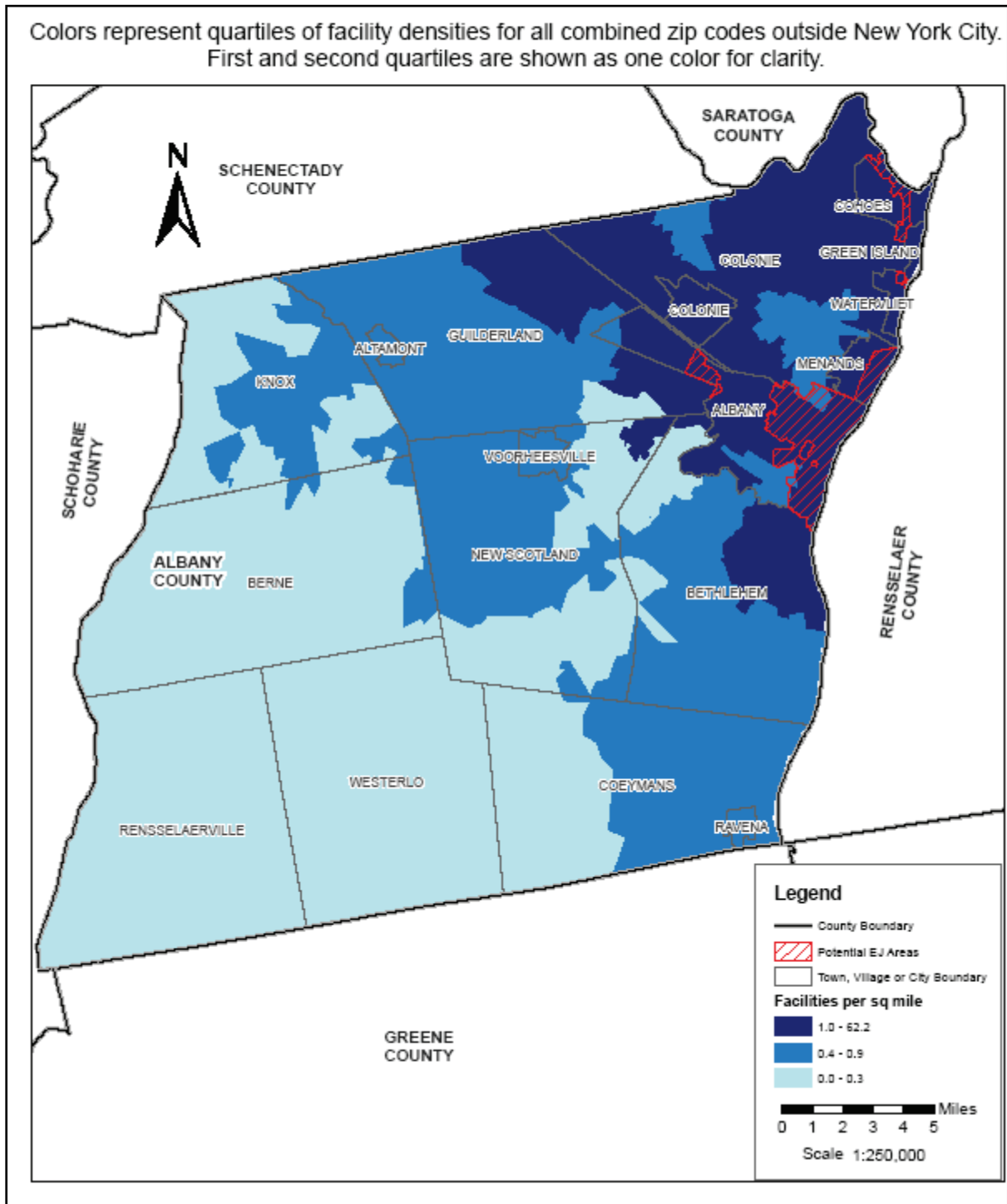
Source: DEC, U.S. Census Bureau, 2000 U.S. Census.

Figure 2. Potential Environmental Justice Areas and Relative Densities of Polluting Facilities Per Square Mile in Kings County Zip Codes



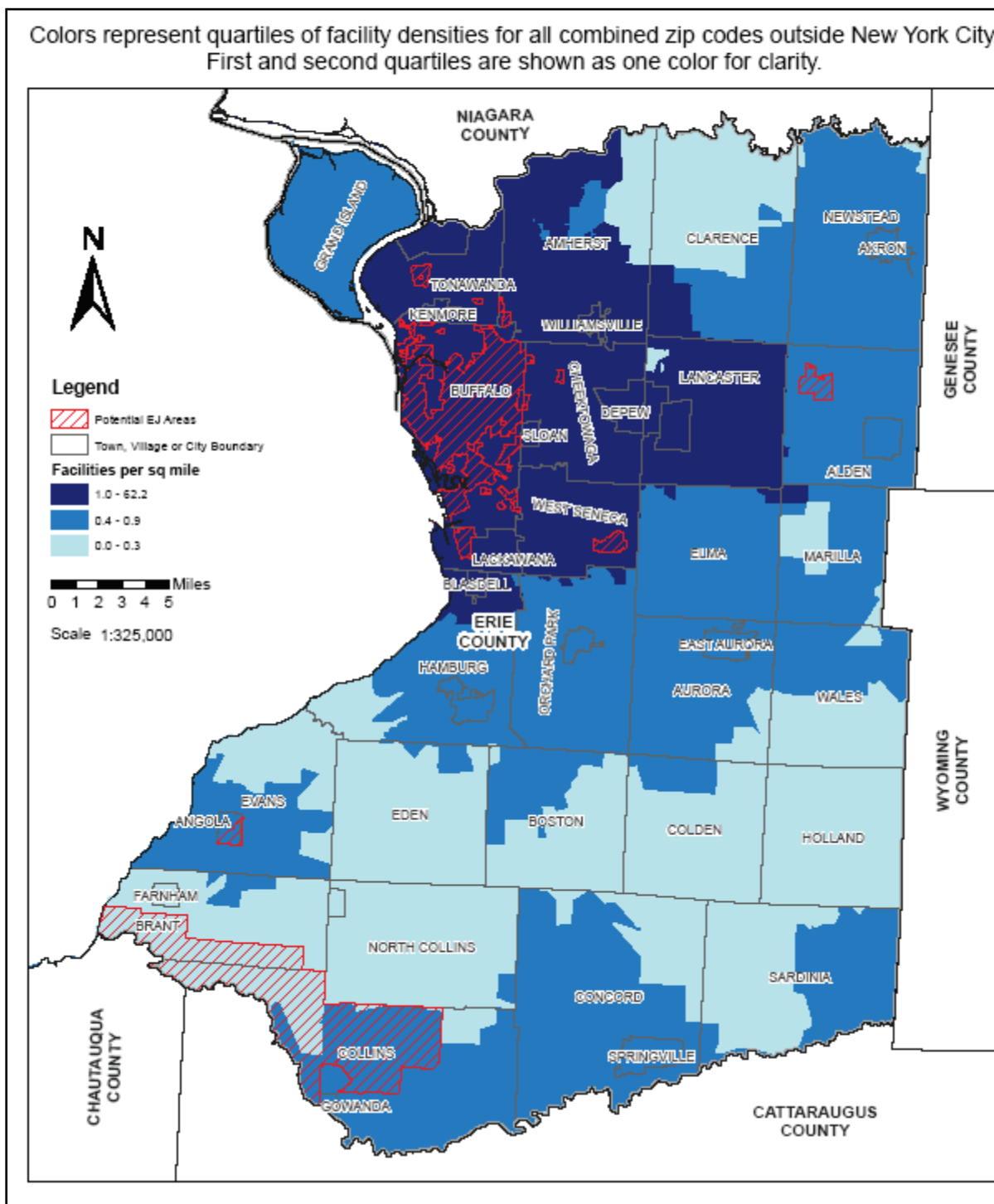
Source: DEC, U.S. Census Bureau, 2000 U.S. Census.

Figure 3. Potential Environmental Justice Areas and Relative Densities of Polluting Facilities Per Square Mile in Albany County



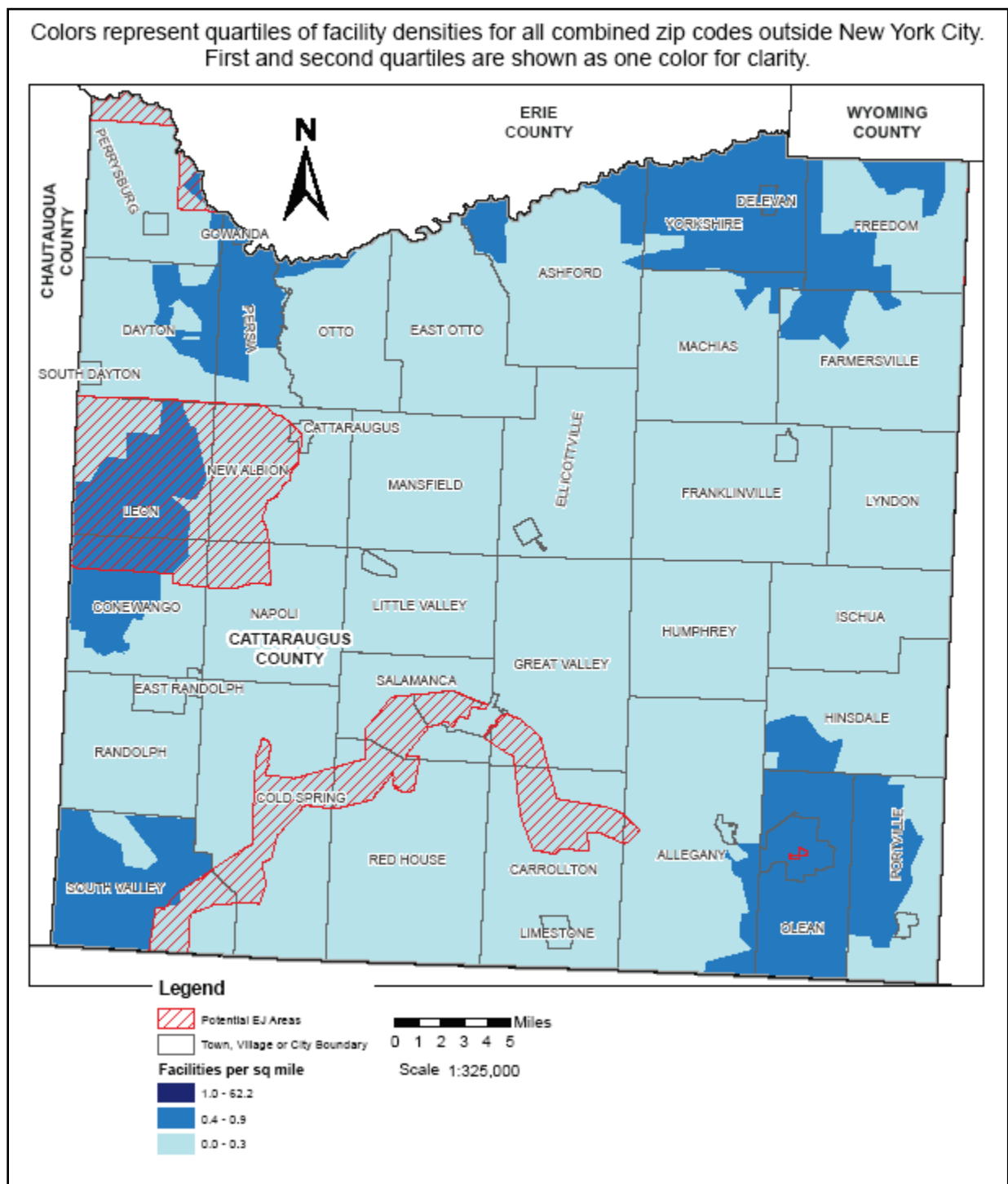
Source: DEC, U.S. Census Bureau, 2000 U.S. Census.

Figure 4. Potential Environmental Justice Areas and Relative Densities of Polluting Facilities Per Square Mile in Erie County Zip Codes



Source: DEC, U.S. Census Bureau, 2000 U.S. Census.

Figure 5. Potential Environmental Justice Areas and Relative Densities of Polluting Facilities Per Square Mile in Cattaraugus County Zip Codes



Source: DEC, U.S. Census Bureau, 2000 U.S. Census.

Mapping the relative densities of DEC-permitted facilities is a powerful analytical tool for designating EJ communities of concern; however, it does have limitations when used by itself. For example, a list of facilities with air permits and registrations does not address all the potential sources of air pollution in an area. Many small emitters, e.g., auto body shops, restaurants, are completely exempt from registration or permitting and would not be captured by maps of permitted DEC facilities. Mobile air pollution sources (cars, trucks, trains, ships, and off-road vehicles) are also unrepresented by mapping these facilities. The same limitations apply to analyses of facilities with SPDES or solid waste permits. There are many small facilities that are not permitted or registered yet still have the potential to produce emissions that can affect nearby residents. Emissions can also vary in type and magnitude among facilities, even for the same permit type, which can add a substantial degree of uncertainty to conclusions based on facility locations.

At present, PEJAs are defined by demographic factors, based on data from the U.S. Census and thresholds of poverty and percentage minority population set forth in DEC Commissioner Policy 29.⁴⁴ The major metropolitan areas of New York all include areas that meet the criteria for PEJAs. The facility density maps created herein include overlays of PEJAs for comparison. Potential EJ Areas are usually found in urban areas, as shown in the maps of Bronx (Fig. 1) and Kings (Fig. 2) Counties, which are mostly shown as PEJAs. Similarly, the maps of Albany (Fig. 3) and Erie (Fig. 4) Counties show the PEJAs are primarily located in the cities of Albany, Watervliet, Cohoes and Buffalo. However, as shown in the map of Cattaraugus County, PEJAs can also be found in rural areas, particularly in counties that have Native American reservations within their borders such as parts of the Allegany, Cattaraugus, and Oil Springs Reservations of the Seneca Nation of Indians appear in the map of Cattaraugus County (Fig. 5).⁴⁵

To examine whether specific types of facilities are over-represented in PEJAs in New York, one method that could be pursued would be a comparison of the density of environmental facilities inside and outside PEJAs. Geographic areas could be assigned to five or six groups based on population density so that the most densely populated PEJAs would be compared to the most densely populated non-PEJAs, and the least densely populated PEJAs would be compared with the least densely populated PEJAs. In conducting this analysis, decisions would have to be made as to the type of facilities to include in the analysis, and geographical considerations, such as level of geography and size of geographic units. As the DEC environmental justice program works with the New York State Interagency Task Force on Environmental Justice to map environmental justice areas, techniques will be developed to refine the analysis of factors such as facility density, demographics, public health and population density to determine which communities have the greatest need for enhanced environmental protections.

3.3 Socio-Economic Impacts

More than 2.6 million people live in New York with incomes below the federal poverty level.⁴⁶ Many low income residents live in older housing units which are less energy efficient and may be heated by older, more polluting boilers. The State's climate, with cold, snowy winters and hot, humid, summers, generates a high demand for heating fuels and electricity for cooling. The price of energy and transportation has a significant effect on low-income consumers. A review of energy expenditures among

⁴⁴ DEC. *Commissioner Policy 29 on Environmental Justice and Permitting*. 2003. <http://www.dec.ny.gov/public/36929.html>

⁴⁵ Seneca Nation of Indians. *Reservations*. 2008. <http://www.sni.org/res.html>

⁴⁶ Division of Housing and Community Renewal (DHCR), Office of Community Development. *New York State Weatherization Assistance Program; Program Year 2009 State Plan: April 1, 2009 - June 30, 2010*. 2009. <http://www.dhcr.state.ny.us/Publications/WeatherizationPlan09/wsp09.pdf>

income levels shows that the percentage of energy expenditures decreases as income increases.⁴⁷ Those with the lowest income had the highest share of energy spending.⁴⁸

3.4 Housing

New Yorkers are more likely to live in rental housing than are the residents of any other state. Census data cited by the New York Weatherization Plan shows that 47 percent of occupied housing units in the State are rental units. Among large states, only California approaches this figure, at 43 percent. Most households in New York that are eligible for energy cost assistance or the Weatherization Assistance Program live in rental housing. Households with incomes below the poverty level are especially likely to live in rental housing and to live in older units. Twenty four percent of renter households have incomes below the federally established poverty level. Seventy-seven percent of those living below this level live in housing built before 1970.⁴⁹

New York's housing stock is one of the Nation's oldest. More than 70 percent of housing units in New York were built before 1970. This means that most housing in the State was built at a time when energy costs were low and technologies to make housing energy-efficient were unavailable or unused. The 2000 US Census shows that about half of New York's households use utility-supplied gas and about one-third of households in the state heat their homes with oil. Renters are far more likely than homeowners to use electricity for heat, a more expensive heating source than natural gas or oil.⁵⁰ More than 72 percent of all residential units that heat with electricity – some 443,000 households – are rental. These units are more commonly located in multifamily housing built in the 1960s and 1970s. Given the income level of residents in these units, and the fact that many of those units were built using inferior energy conservation techniques, it is reasonable to conclude that some of New York's poorest residents are paying the highest energy bills as a percentage of their income.

3.5 Energy Costs and Economic Effects of Carbon Reduction Strategies

Many of the State's best energy efficiency and renewable development programs have both positive and negative effects on low-income communities. Taken at face value, these programs appear to only increase the cost of energy for consumers with low- and middle-income consumers bearing a greater burden from these increased costs. However, the Regional Greenhouse Gas Initiative (RGGI) is expected to benefit New Yorkers by reducing greenhouse gas emissions over time and creating a pool of funding for energy efficiency programs that will lower energy bills.⁵¹

The Congressional Budget Office has estimated that a cap-and-trade policy that achieved a 15 percent reduction in carbon dioxide emissions would raise the costs of energy and energy-related products annually by an average of \$680 (in 2006 dollars) for the 20 percent of households with the lowest incomes (those with incomes below about \$27,000, in 2008 dollars, for a family of three). According to

⁴⁷ U.S. Bureau of Labor Statistics. *Précis*. 2006. <http://www.bls.gov/opub/mlr/2006/06/precis.pdf>

⁴⁸ U.S. Bureau of Labor Statistics. 2006.

⁴⁹ DHCR. 2009.

⁵⁰ DHCR. 2009.

⁵¹ Regional Greenhouse Gas Initiative. 2009. http://www.rggi.org/states/program_info/New_York

Congressional Budget Office estimates, the impact of those cost increases is the equivalent of a 3.3 percent reduction in the real (inflation-adjusted) after-tax income (inflation-adjusted) of the 20 percent of households with the lowest incomes. In contrast, the richest 20 percent of households (those with incomes above \$106,000 in 2007 dollars for a family of three) would experience the equivalent of a 1.7 percent reduction in real after-tax income, or about half as much.⁵²

Restrictions on greenhouse-gas emissions, whether achieved through a cap-and-trade system that directly limits annual emissions or a carbon tax, are necessary to avoid unacceptable economic and environmental costs from global climate change. These policies aim to limit the free discharge of greenhouse gases into the atmosphere at the lowest possible cost by providing market signals encouraging energy efficiency and the development of clean alternatives to fossil fuel. At the same time, however, these measures raise the price of energy and energy-related products and services.⁵³ If nothing is done to protect people of limited means, low income communities will be unduly burdened by the higher costs of electricity.⁵⁴ It is therefore necessary to make sure that resources are available to shield low-income households from the increased strain of raising energy costs.

3.6 Land-Use Impacts

Many older generation sources, especially coal fired plants, and other industrial sites are contaminated and have become brownfields – leaving land fallow in communities for years without being cleaned up or utilized, contributing to blight and stymieing economic revitalization. Some power plant and industrial sites are likely to create contaminated soil that will remain polluted years after the power plant closes down.⁵⁵ However, with proper site remediation, brownfields could be reused in a variety of ways, some of which may support the State’s clean energy agenda. For example, brownfields could be used for renewable energy facilities, such as concentrated photovoltaic (PV) arrays and alternative fuels refueling facilities.

Older industrial areas and power plants were often located on large tracts of urban waterfront property due to the wet cooling needed for generating equipment or access to shipping for fuels and materials. These urban industrial areas have become the focus of redevelopment initiatives to create mixed use economic development, employment opportunities, green spaces and waterfront access for environmental justice communities.

A number of mitigation strategies can be deployed to minimize land use impacts. For example, repowering existing energy sources both reduces pollution and reuses property already dedicated to energy. Renewable energy sources like solar panels and urban windmills can be placed on existing buildings and provide many of the benefits of other forms of distributed generation without the pollutants associated with fossil fueled sources. The advance of solar energy technology and the ability to use photovoltaic cells on roofs and other small man-made surfaces⁵⁶ makes urban environments, as well as the more ‘typical’ large solar fields, important potential sources of clean renewable energy.

⁵² Chad Stone & Matt Fielder. Center on Budget & Policy Priorities. *The Effects of Climate-Change Policies on the Federal Budget and the Budgets of Low-Income Households: An Economic Analysis*. 2008. <http://www.cbpp.org/files/10-24-07climate.pdf>

⁵³ Stone & Fielder. 2008.

⁵⁴ Stone & Fielder. 2008.

⁵⁵ EPA. *Clean Energy – Land Resource Use*. 2008. <http://www.epa.gov/cleanenergy/energy-and-you/affect/land-resource.html>

⁵⁶ A.J. Dolman, A. Verhagen & C.A. Rovers eds. *Global Environmental Change and Land Use* 195. 2003.

Urban “heat islands” form as cities cover natural land areas with pavement, buildings, and other surfaces that absorb and retain heat. As a result, the natural cooling effect of trees and vegetation is greatly reduced or lost. Additionally, tall buildings and narrow streets trap and concentrate waste heat from vehicles, factories, and air conditioners. Increasing the amounts of urban green space, tree canopies, and vegetation, can help mitigate the effects of urban heat islands and reduce energy demands.⁵⁷ Trees, green roofs and other green infrastructure⁵⁸ can also lower the demand for air conditioning, thereby decreasing emissions from power plants.⁵⁹

Residents living near green space have higher levels of perceived physical health and well-being than residents with less access to green space.⁶⁰ Tree-lined paths and streets may induce walking and bicycling, reducing vehicular traffic. Green space also acts as a carbon sink in urban communities, therefore helping to mitigate some of the carbon dioxide emissions from power generating sources.

Loss of green space should be avoided, but when losses do occur, mechanisms should be in place to encourage or require creation of new green space in the same neighborhood. Green, open space is critically important in our urban neighborhoods. Health differences in residents of urban and rural municipalities may be partly explained by the amount of green space in their direct living environment.⁶¹ Energy related land-use decisions can be made in ways that encourage and help maintain access to green spaces and minimize disproportionate environmental and health burdens.

3.7 Transportation Impacts

Both stationary and mobile emission sources affect environmental justice communities. In New York, many low income communities experience high traffic volume. Traffic congestion contributes to air pollution and to air quality that does not meet the national air quality standards designed to protect public health. High traffic volumes cause noise pollution in urban neighborhoods – interfering with sleep, conversation- further reducing quality of life. Heavy truck traffic lowers property value at a rate 150 times greater than the same volume of cars.⁶² An increase in heavy truck traffic may also cause damage to nearby homes and buildings through ground level vibrations. Reducing or mitigating the impacts of

⁵⁷ A. Belle Hudischewsky, Sharon Douglas & Jeffrey Lundgren. *Meteorological And Air Quality Modeling To Further Examine The Effects Of Urban Heat Island Mitigation Measures On Several Cities In The Northeastern U.S.* 2001. <http://www.epa.gov/heatisland/resources/pdf/sensitivitiesreport.pdf>

⁵⁸ According to the EPA, green infrastructure is an adaptable term used to describe an array of products, technologies, and practices that use natural systems – or engineered systems that mimic natural processes – to enhance overall environmental quality and provide utility services. As a general principle, green infrastructure techniques use soils and vegetation to infiltrate, evapotranspire, and/or recycle stormwater runoff. When used as components of a stormwater management system, green infrastructure practices such as green roofs, porous pavement, rain gardens, and vegetated swales can produce a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these technologies can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits. EPA. *Green Infrastructure: Policies and Resolutions*. 2009. <http://cfpub.epa.gov/npdes/greeninfrastructure/information.cfm#greenpolicy>

⁵⁹ EPA. *Managing Wet Weather with Green Infrastructure*. 2009. http://cfpub.epa.gov/npdes/home.cfm?program_id=298

⁶⁰ EPA. *Managing Wet Weather with Green Infrastructure*. 2009.

⁶¹ Jolanda Maas et al., *Green Space, Urbanity, and Health: How Strong is the Relation?*, 60 *J. Epidemiology & Community Health*. 2006. <http://jech.bmj.com/cgi/content/full/60/7/587>

⁶² Daniel Haling & Harry Cohen. *Residential Noise Damage Costs Caused by Motor Vehicles*. 1559 *Transportation Research Records*. 1996.

traffic in areas of high traffic volume, particularly in environmental justice communities, would improve the quality of life for residents of these neighborhoods.

There is an essential connection between transportation decisions and the impacts such decisions have on different socio-economic groups. There are a variety of means by which environmental justice efforts can merge with transportation planning, including public involvement in transportation decisions so that changes positively impact communities and provide better transportation with improved access to job opportunities, shops and medical facilities.

As discussed in the Transportation Issue Brief, strategies that reduce vehicle miles traveled, mitigate congestion, facilitate the shift toward electrification and alternative fuel vehicles, and promote use of public transportation will reduce petroleum use, greenhouse gas and other pollutant emissions, thereby reducing impacts of the transportation sector on environmental justice communities.

3.8 Climate Change Impacts

As discussed in the Climate Change and Health Issue Briefs, the production and use of fossil fuels like coal, oil, and natural gas are the primary sources of greenhouse gas emissions (GHG) that contribute to climate change. In the United States, the effects of climate change may have a disproportionately high impact on low-income communities and communities of color. Climate change could also impose economic burdens such as increasing consumer food costs due to impacts on national and world agriculture. Many of these communities are already overburdened by pollution, higher asthma rates and other environmentally related health problems. Residents of these communities are often financially unable to move or adapt to climate change impacts. Mitigating these impacts at the local and state level, will not only help New York and its residents, but will also contribute to alleviating the effects of climate change on a global scale.

3.8.1 Climate Justice and Health Risks

Climate change may adversely impact human health in many ways that are only beginning to be understood. For example, an increase in hot and humid days in the summer may lead to increased incidence of heat-stress-related illnesses and deaths. Higher summer temperatures also increase the formation of ozone and smog resulting in additional negative health impacts, which may disproportionately impact low income populations.⁶³ In 2006, a heat wave in New York City was reported to be a factor in 140 deaths.⁶⁴ If the U.S and New York do not take action to reduce greenhouse gases, the frequency of heat waves is expected to increase, which would then have severe effects on human health.⁶⁵

Studies assessing climate change impacts on public health indicate that increased heat stress and ozone concentrations may take a significant toll especially among susceptible urban populations such as

⁶³ See the Health, Energy Production and Energy Use Issue Brief for more information.

⁶⁴ Richard Perez-Pena, *Heat Wave Was a Factor in 140 Deaths, New York Says*, N.Y. Times, Nov. 16, 2006. <http://www.nytimes.com/2006/11/16/nyregion/16heat.html>

⁶⁵ NYSERDA. *Research Focused on the Northeastern U.S.* 2009. http://www.nyserda.org/programs/Environment/EMEP/climate_change_science_effects_northeast.asp

children, the elderly and individuals with cardiovascular and respiratory disease.⁶⁶ Some limited evidence from a study in New York City suggests that the health consequences of ozone and other air pollution could be greater in environmental justice communities where a greater number of individuals may be asthmatic compared to other communities compared to other communities with similar air quality.⁶⁷

3.8.2 Sea Level Rise

Some scientists believe that if left unchecked, climate change could result in a mid-century sea level rise of 2.5 to 13 inches.⁶⁸ By the end of the century, sea levels are projected to rise from 4 to 33 inches, depending on the scenario model, putting low-lying coastal areas of the Northeast at increasing risk of erosion as well as flooding during storms.⁶⁹ Coastal flooding is projected to disrupt New York City's infrastructure and transportation system with increasing frequency and to inundate large areas of the City. A recent study for the New York City Panel on Climate Change (NPCC) used global climate models and local geographic information to predict New York City sea levels will rise by 10 to 24 inches.⁷⁰

To the extent that low income and minority communities are located in areas of the state where sea level rise and or storm surge events are expected to take place, such climate change impacts could result in the displacement of many residents in these communities.⁷¹

⁶⁶ In addition to the Climate Change Issue Brief, see also Knowlton, K., et al. *Projecting Heat-Related Mortality Impacts Under a Changing Climate in the New York City Region*. 97 *American Journal of Public Health*. 2007.

⁶⁷ NYSEDA. *A Study of Ambient Air Contaminants and Asthma in New York City Final Report 06-02*. 2006. http://www.nyserda.org/publications/Report%2006_02_web.pdf

⁶⁸ NECIA. *Northeast Climate Impacts Assessment, Climate Change in the U.S. Northeast*. 2006. http://www.climatechoices.org/assets/documents/climatechoices/NECIA_climate_report_final.pdf

⁶⁹ NECIA. 2006.

⁷⁰ New York City Panel on Climate Change. *Climate Risk Information*. 2009. http://www.nyc.gov/html/om/pdf/2009/NPCC_CRI.pdf

⁷¹ U.S. Global Change Research Program. *Global Climate Change Impacts in the United States*. 2009. <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf>

4 Conclusion

Environmental justice is not an issue we can afford to relegate to the margins. It has to be part of our thinking in every decision we make. ~ Lisa Jackson, Administrator, United States Environmental Protection Agency, 2009

Environmental justice can be furthered by adopting policies to encourage and facilitate public participation in decisions, clean energy programs to improve efficiency and clean energy deployment, and targeted programs that ensure environmental justice communities are included in the transition to a clean energy economy.

4.1 Fair and Meaningful Public Involvement

Increasing opportunities for public participation in the decision making process would allow for greater transparency in agency decision making, and would reduce the likelihood that communities will be excluded from the decision making process. Fair and meaningful public involvement would include, among other things, availability of information, continual transparency, and early consultation and collaboration.

Encouraging and facilitating community involvement improves communication and embraces problem solving techniques that foster strong and trustworthy relationships between the community, regulatory agencies, and industries in the energy sector. Greater involvement in the decision making process increases community confidence in agency decisions and ensures that potential problems and possible solutions are addressed early in the process. Increased community involvement provides greater potential for addressing community concerns in energy siting decisions before disputes arise, improves agency relations with communities throughout the state, and helps New York move towards environmental equity.

Strategies to accomplish fair and meaningful public involvement would include:

- Public notice of agency actions provided through list-serves, interested-party alerts, and notices on the internet and at local repositories, in multiple languages where necessary.
- Public service information and announcements posted in educational facilities, community centers and health clinics to raise awareness in communities, including information regarding energy conservation and access to energy efficiency funding for the home and workplace.
- Public meetings held at alternative times and locations to address the needs of working residents and the elderly, and provisions for foreign language translation of facts sheets and other information.
- Through Governor Paterson's Environmental Justice Task Force, the Department of Environmental Conservation, New York Power Authority and New York State Energy Research

and Development Authority have appointed, and other agencies are considering appointing a staff member as the environmental justice/energy liaison or coordinator who will work to improve community involvement. Having an environmental justice point person on staff can ensure that environmental justice communities are involved in future decision making processes and provide input on agency policies and programs.

4.2 Energy Facility Siting

When siting new facilities, assessing disproportionate health risks and environmental impacts could help identify overburdened communities and help develop measures to avoid or mitigate potential impacts in these communities. This could be achieved by: (a) enhancing siting and permitting processes to require a comprehensive environmental and cumulative impact review; (b) improving emissions criteria to reduce health and environmental risks to burdened populations; and (c) providing early and consistent public participation in siting decisions. Additional steps such as encouraging clean energy alternatives with zero increase in air pollution, and providing Technical Assistance Grants (TAG) for impacted communities can reduce disparate impacts of energy siting and permitting decisions.

Public Service Law Article X, which expired in 2003, provided a uniform environmental review and systematic processes, and supported public input with funding of up to \$300,000 for technical assistance to community leaders and interested parties. Article X also required public hearings and allowed for public participation in the administrative hearings regarding the siting of the facility and the environmental review. Additionally, Article X required all energy sources over 80 megawatts to conduct a thorough environmental assessment. Under certain circumstances, current siting regulations under the State Environmental Quality Review Act allow developers to issue a negative declaration thereby relieving them of the obligation of issuing an Environmental Impact Statement or conducting any public outreach. A new siting law or policy could look to include an enhanced public participation plan, technical assistance grants, and a review of impacts to environmental justice communities based upon past experience with Article X.

4.3 Repowering and Upgrading Existing Energy Facilities

Repowering or retrofitting older electric generating facilities or boilers could help to reduce health risks and environmental impacts in environmental justice communities. By creating permitting review assurances, or other incentives for funding and programs, the State could encourage repowering of the State's oldest facilities. For instance, DEC has developed a regulation for the installation of Best Available Retrofit Technology (BART) on stationary sources (not just power plants).⁷² This regulation will require retrofitting and target emitting sources built between 1962 and 1977 that are not controlled under other programs, such as New Source Review (NSR). Repowering or retrofitting old plants can increase electric generation, improve energy efficiency, reuse land already dedicated to energy production, maintain and create jobs, increase the tax base, and reduce energy costs.

4.4 Distributed Generation

Increasing clean distributed generation--including solar, wind, fuel cells, and combined heat and power--can reduce the need for centralized power generation, thereby reducing air emissions from clustered

⁷² See the Environmental Impact and Regulation of Energy Systems Issue Brief for more information.

power plants in environmental justice communities. In New York City and on Long Island, transmission constraints limit the amount of power that can be imported from upstate to meet electricity needs downstate. Distributed generation, in conjunction with reliability criterion, would result in the vast majority of New York City's and Long Island's electricity needs being met with clustered in-City and on-Island power generation facilities. Increasing distributed power generation capacity in these "load pocket" areas would help to reduce the need for dirtier power from central generation facilities. While New York City does not have significant potential to install large-scale renewable resources (with the exception of offshore wind), it does have enormous distributed generation potential that could be exploited to assist in meeting the State's clean energy goals.

4.5 Clean Energy Incentives for Environmental Justice Communities

Targeting the State's clean energy incentive programs to vulnerable populations and low income populations could advance the State's clean energy agenda and maximize the benefits to these communities. Grants provided through the New York State Energy Research and Development Authority, and funds from the Renewable Portfolio Standard, System Benefits Charge, and the Regional Greenhouse Gas Initiative can be used for energy audits of municipal housing developments, design and construction of green buildings, retrofitting older buildings in PEJAs, and retrofitting diesel vehicle fleets. Other funding programs, such as green innovation grants at Environmental Facilities Corporation and environmental justice grants through the Department of Environmental Conservation can be used for green infrastructure in environmental justice communities.

Public service information and announcements are an essential component to changing behavior among all constituents. Public announcements that include information regarding energy conservation and access to energy efficiency funding for the home and workplace can be posted in educational facilities, community centers and health clinics, in multiple languages when necessary, to raise awareness in communities.

As discussed above, energy expenses are an economic drain on low-income communities. Providing incentives, encouraging energy efficiency in affordable housing, and making energy efficiency upgrades available to low income communities can greatly reduce energy related economic burdens. The State could ensure that the RGGI proceeds continue to dedicate funds for energy efficiency in low income communities.

4.6 Clean Energy Jobs and Pathways out of Poverty

Investments in clean energy programs create job opportunities for residents in PEJAs. As discussed in more detail in the Energy Costs and Economic Development Issue Brief, New York's workforce development strategy is in alignment with the employment needs of the State's emerging clean energy industry and includes pathways out of poverty training for residents of environmental justice communities.

4.7 Protect New York's Low-Income Populations

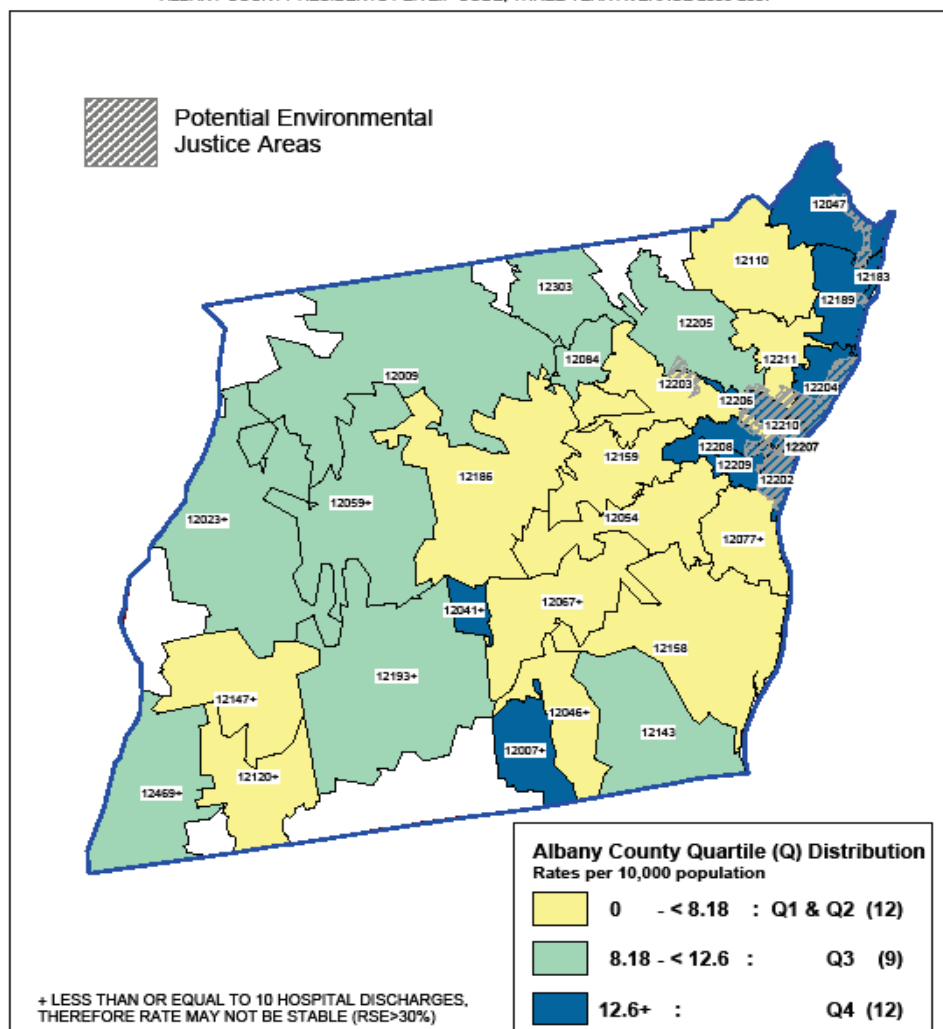
As policy makers consider new carbon policies, low-income customers should be protected from potential price increases. The federal Low Income Home Energy Assistance Program (LIHEAP) and the Weatherization Assistance Program (WAP) provide direct financial assistance and energy efficiency

upgrades to reduce energy costs for low-income families, and should be expanded to reach a larger number of households.

At the state level, new technologies and rate designs can help to create a more equitable rate structure for low-income customers. Deployment of smart grid/advanced metering infrastructure (AMI) would help reduce emissions and may facilitate improved retail energy pricing in New York. Through AMI technology, consumption could be better understood and price signals could be sent from utilities to consumers to inform their decisions on personal energy use. Eventually, these technologies could help the grid operators avoid the use of peaking units and other polluting back-up systems during peak demand days in environmental justice communities as customers could curtail their usage during these high price-high demand days.

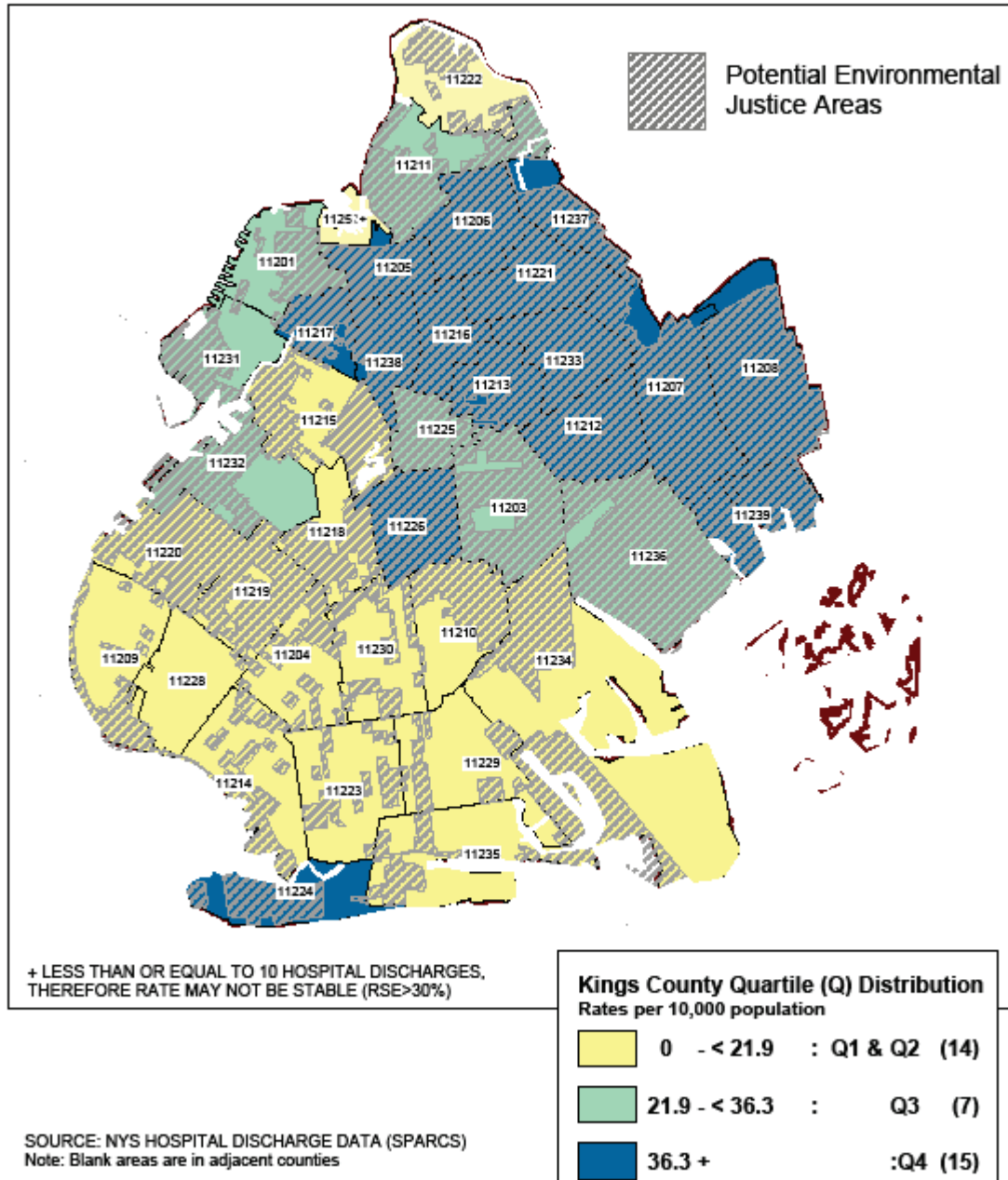
5 Appendix A - Maps of Asthma Discharge Rates and Potential Environmental Justice Areas

NEW YORK STATE ASTHMA HOSPITAL DISCHARGES
 RATES PER 10,000 POPULATION, TOTAL
 ALBANY COUNTY RESIDENTS PER ZIP CODE, THREE YEAR AVERAGE 2005-2007

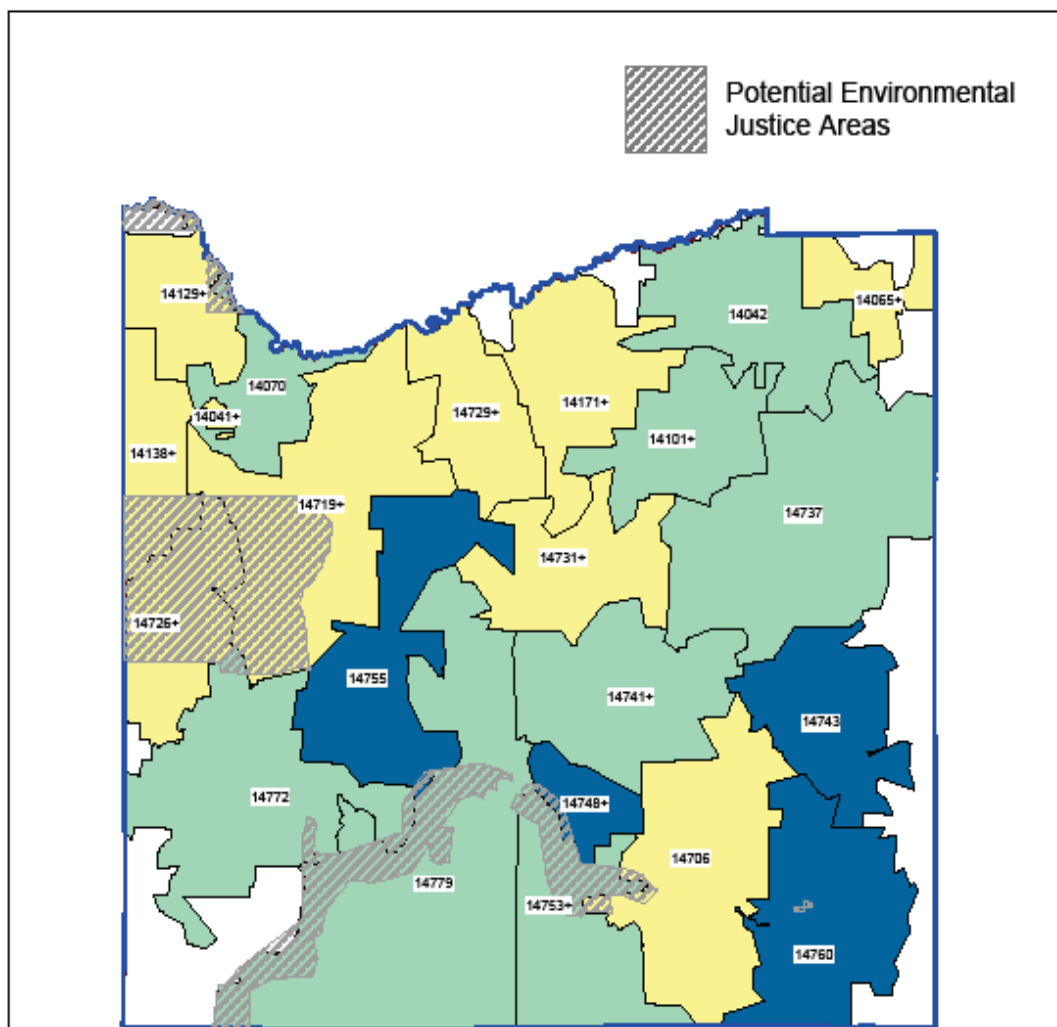


SOURCE: NYS HOSPITAL DISCHARGE DATA (SPARCS)
 Note: Blank areas are in adjacent counties

NEW YORK STATE ASTHMA HOSPITAL DISCHARGES
 RATES PER 10,000 POPULATION, TOTAL
 KINGS COUNTY RESIDENTS PER ZIP CODE, THREE YEAR AVERAGE 2005-2007



NEW YORK STATE ASTHMA HOSPITAL DISCHARGES
 RATES PER 10,000 POPULATION, TOTAL
 CATTARAUGUS COUNTY RESIDENTS PER ZIP CODE, THREE YEAR AVERAGE 2005-2007



+ LESS THAN OR EQUAL TO 10 HOSPITAL DISCHARGES,
 THEREFORE RATE MAY NOT BE STABLE (RSE>30%)

SOURCE: NYS HOSPITAL DISCHARGE DATA (SPARCS)
 Note: Blank areas are in adjacent counties

Cattaraugus County Quartile (Q) Distribution		
Rates per 10,000 population		
Yellow	0 - < 8.18	: Q1 & Q2 (10)
Green	8.18 - < 12.6	: Q3 (8)
Blue	12.6 +	: Q4 (4)

NEW YORK STATE ASTHMA HOSPITAL DISCHARGES
 RATES PER 10,000 POPULATION, TOTAL
 ERIE COUNTY RESIDENTS PER ZIP CODE, THREE YEAR AVERAGE 2005-2007

