COLUMBIA CLIMATE SCHOOL | Earth Networks
Interdisciplinary Network on Cumulative Impact
Technical Engagement

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New York State Department of Environmental Conservation
Office of Environmental Justice
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Via email (alanah.keddell-tuckey@dec.ny.gov)

RE: Additional Input Following EJ Siting Law Regulations Input Session

Director Keddell-Tuckey:

Thank you for the invitation to attend the input session held on September 16, 2025 to discuss the implementation of the Environmental Justice Siting Law (EJ Siting Law) (Chapter 840 of the Laws of 2022, as amended by Chapter 49 of the Laws of 2023). The Interdisciplinary Network on Cumulative Impact Technical Engagement at Columbia University (INCITE Network) is a research network which seeks to advance methods of assessing cumulative health, environmental, and pollution burdens in disadvantaged communities through an interdisciplinary approach. The INCITE Network submits this additional input in response to the questions raised by the New York Department of Environmental Conservation (DEC) at the session.

A. Criteria to Include in the Existing Burden Report

DEC question #1: What objective criteria or screening tools can be used to measure and evaluate existing burdens?

New York State's proposed Disadvantaged Communities (DAC) criteria, which include various environmental stressors, demographic and socioeconomic factors, and community health indicators, would be a useful starting point for building a set of criteria to evaluate existing burdens. However, some key health stressors were considered but excluded from the DAC criteria, in some cases because of DEC's concern with availability, reliability, and consistency in sub-county-level data. To ensure that burdens are accurately described in existing burden reports, we urge DEC to include those additional stressors. Below we offer recommendations to incorporate additional relevant criteria while addressing existing data constraints.

1. Map zip code-level health data to census tracts

For health outcomes currently only available at the zip-code level, such as childhood lead exposure, preterm birth, and birth defects, overlapping zip-code and tract boundaries could be used to create tract-level proxies, allowing inclusion of these indicators in the DAC framework without

altering the overall tract-based scoring system. This approach to addressing data granularity issues has been or will be deployed by federal and state agencies, as well as academic researchers.

For example, the U.S. Department of Housing and Urban Development (HUD) publishes ZIP Code Crosswalk Files,[1] which provide tract-to-ZIP correspondence with population-based weights, and the Census Bureau provides ZIP Code Tabulation Areas (ZCTAs) that can facilitate tract-level estimation. HUD uses this data to determine program eligibility and refine analysis of neighborhood needs to determine resource allocation. Collaborative research from HUD and GIS research faculty at the University of Maryland describes using ZCTA to tract mapping to apply data in public health studies.[2] There are also examples of academic research that have used this methodology.[3]

Methods for this mapping include population-weighted allocation, in which the zip-level value is apportioned to each intersecting tract based on its share of the zip code population, or area-weighted allocation, which distributes values according to the proportion of land area overlap. Hybrid approaches combining population and area weights can also be applied to improve accuracy. While caution is required to ensure that these methods are applied appropriately,[4] doing so could allow DEC to partially incorporate zip-level health metrics into its existing DAC criteria, providing a relative measure of health vulnerability without compromising the tract-level consistency of the model. It is also important to note that the two indicators measured reliably at the zip-level in New York, childhood lead and birth defects, are less directly correlated with the air pollution indicators that the DAC criteria includes. As a result, incorporating these indicators could provide additional, non-redundant information to the health stressor component. For this reason, prioritizing these indicators and using a zip-code-to-tract mapping approach is likely the most effective way to measure and evaluate existing burdens.

Notably, Massachusetts also recently adopted this approach to implement its Environmental Justice Policy: "Because data for these indicators are not reliably available at the census block group level, data will be evaluated at the smallest appropriate geography with the

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[1] *HUD USPS ZIP Code Crosswalk Files*, OFF. POL'Y DEV. & RSCH., https://www.huduser.gov/portal/datasets/usps_crosswalk.html (last visited Oct. 2, 2025).

[2] Alexander Din & Ron Wilson, *Crosswalking ZIP Codes to Census Geographies: Geoprocessing the U.S. Department of Housing & Urban Development's ZIP Code Crosswalk Files*, 22 CITYSCAPE 293 (2020), https://www.huduser.gov/portal/periodicals/cityscpe/vol22num1/ch12.pdf.

[3] John R. Hipp et al., *Block, Tract, and Levels of Aggregation: Neighborhood Structure and Crime and Disorder as a Case in Point*, 72 AM. SOCIOLOGICAL REV. (2007), https://journals.sagepub.com/doi/10.1177/000312240707200501; Michael T. Cudnik et al., *Surrogate Markers of Transport Distance for Out-of-Hospital Cardiac Arrest Patients*, 16 PREHOSPITAL EMERGENCY CARE 266 (2012), https://www.tandfonline.com/doi/full/10.3109/10903127.2011.615009.

[4] For example, some studies flag potential issues with representational errors and spatial mismatching due to zip-code and ZCTA uncertainty. *See* Nancy Krieger et al., *Zip Code Caveat: Bias Due to Spatiotemporal Mismatches Between Zip Codes and US Census–Defined Geographic Areas—The Public Health Disparities Geocoding Project*, 92 AM. J. PUB. HEALTH 1100 (2002), https://pmc.ncbi.nlm.nih.gov/articles/PMC1447194/; Tony H. Grubesic & Timothy C. Matisziw, *On the use of ZIP codes and ZIP code tabulation areas (ZCTAs) for the spatial analysis of epidemiological data*, 5 INT'L J. HEALTH GEOGRAPHICS (2006), https://pmc.ncbi.nlm.nih.gov/articles/PMC1762013/.

understanding that EJ populations are characterized as having vulnerable health if they reside in a community/census tract/zip-code meeting the vulnerable health criteria."[5]

2. Incorporate PLACES data to expand health metrics

In addition to adapting New York zip code-level data, DEC could also incorporate additional health metrics with modeled tract-level estimates from PLACES data, produced by the U.S. Center for Disease Control and Prevention (CDC). PLACES includes health data on diabetes prevalence, obesity, high blood pressure, smoking, binge drinking, housing insecurity, food insecurity, and more. These metrics could be used to address gaps in the current DAC criteria where direct data are unavailable because New York State does not track those indicators by locality. The PLACES interactive mapping tool is available here.

Importantly, one of the stated purposes of PLACES data is to support policy decision-making at local and state levels, which aligns directly with DEC's current regulatory efforts. PLACES estimates are not directly observed but rely on small-area estimation techniques that extrapolate from survey responses. UMass Donahue's Institute of Economic and Public Policy Research completed an application-relevant analysis of small area estimation techniques for municipal environmental health data collection for use by the Massachusetts Department of Public Health's Bureau of Environmental Health Studies.[6] Additional research also supports the validity of small area estimation methodologies to provide model-based data on geographic variations in health indicators at granular levels.[7]

DEC question #3: The law uses the term "disproportionate pollution burden." What does this term mean to you and what health or other related information be considered under this term?

DEC also raised a related question about the health information that should be considered under the term "disproportionate pollution burden." We recommend that DEC consider the DAC criteria and the additional health metrics discussed above when evaluating "disproportionate pollution burden."

[5] *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs*, MASS. 7 (2021), https://www.mass.gov/doc/environmental-justice-policy6242021-update/download.
[6] Susan Strate et al., *Small Area Population Estimates for 2011 through 2020*, UMASS DONAHUE INSTITUTE (2016), https://matracking.ehs.state.ma.us/docs/UMDI_Small_Area_Population_Estimates_for_2011_through_2020.pdf.
[7] Xingyou Zhang et al., *Validation of Multilevel Regression and Poststratification Methodology for Small Area Estimation of Health Indicators From the Behavioral Risk Factor Surveillance System*, 182 AM. J. EPIDEMIOLOGY 127 (2015), https://academic.oup.com/aje/article/182/2/127/93984; Kurt J. Greenlund et al., *PLACES: Local Data for Better Health*, 19 TOOLS FOR PUB. HEALTH PRACTICE (2022), https://www.cdc.gov/pcd/issues/2022/21_0459.htm.

B. "De Minimis" Amount of Pollution for New Permits

DEC question #4: What constitutes a de minimis amount of pollution?

We recommend that DEC define "de minimis" using protective health-based standards to inform the selection of low thresholds of pollution that would constitute a "de minimis amount of pollution." We suggest this as an alternative to defining "de minimis" as "one drop of pollution." Our concern with a "one drop" standard is that this definition would effectively prevent *any* new facility from being built in a DAC, including facilities that would be desirable and serve essential community needs, such as health care clinics. Because the EJ Siting Law does not authorize DEC to make exceptions to the permitting standard for new projects in a DAC (e.g., there is no carve out for facilities serving an essential need),[8] a "one drop" standard could have adverse consequences in DACs.

The INCITE Network has examined public health literature and considered various methodologies for setting "de minimis" pollution thresholds. We suggest the following approach to DEC. Our recommendation is to base de minimis determinations on cancer and noncancer risk benchmarks,[9] which are the most policy-tested cumulative outcome metrics used by the U.S. Environmental Protection Agency (EPA) and by states such as Massachusetts, New Jersey, and California. These benchmarks can integrate multiple exposure pathways (air, water, soil) and express cumulative risk in familiar health-based units such as lifetime excess cancer risk or noncancer hazard risk.

Massachusetts' MATRISt[10] model provides a useful example of this approach, applying the standard EPA-derived lifetime excess cancer risk (typically between 1×10^{-6} and 1×10^{-4}) and hazard index thresholds without adjustment. This framework establishes consistent, interpretable limits, but it does not account for variation in baseline vulnerability across communities.

A key challenge in defining de minimis for cumulative impacts is that population-based risk thresholds do not account for the higher baseline vulnerability of disadvantaged communities. The lifetime excess cancer risk threshold (between 1×10^{-6} or 1×10^{-4} excess cases) captures health outcomes for cumulative exposures for a broad population of interest, but fundamentally underestimates the health burden in disadvantaged communities due to the omission of social stressors and co-exposures. To address this, we propose that DEC adopt an approach that adjusts thresholds used in standard risk tools to correct the underestimate of cumulative risk in such communities. The goal of this method is to preserve the interpretability and health relevance of the standard risk metrics while adjusting their thresholds to reflect real-world vulnerability.

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[8] N.Y. ENV'T CONSERV. LAW § 70-0118(3)(b).
[9] *Guidelines for Carcinogen Risk Assessment*, EPA (2005), https://www.epa.gov/sites/default/files/2013-09/documents/cancer_guidelines_final_3-25-05.pdf; *Calculating Hazard Quotients and Cancer Risk Estimates*, CDC (2025), https://www.atsdr.cdc.gov/pha-guidance/conducting_scientific_evaluations/epcs_and_exposure_calculations/hazardquotients_cancerrisk.html.
[10] *Cumulative Impact Analysis in Air Quality Permitting*, MASS., https://www.mass.gov/info-details/cumulative-impact-analysis-in-air-quality-permitting (last visited Oct. 7, 2025).

The scale factor answers the question: how much does living in a disadvantaged community raise the risk of adverse health effects on top of exposure to environmental toxicants? In practice, DEC could define de minimis as an adjusted health-based threshold that begins with the standard benchmark (e.g., 1×10^{-6} excess cancer risk or HI = 1.0) and applies a scale factor reflecting the excess risk or interaction magnitude associated with disadvantaged communities. For example, if epidemiologic data indicate a 30% greater combined risk due to social and environmental interaction, the corresponding de minimis threshold could be adjusted downward proportionally. This framework would ensure that de minimis levels remain quantitatively interpretable, health-based, and aligned with regulatory precedent, while meaningfully incorporating the EJ Siting Law's mandate to account for cumulative and disproportionate health burdens.

Several methods could be used to derive this scale factor. The first relies on epidemiologic evidence of interaction and effect modification between environmental exposures and social disadvantage. Several studies[11] demonstrate that these exposures interact synergistically, amplifying the health effects of air pollution beyond what additive models predict. Using estimates of relative risk from interaction data (statistical models that estimate health risk modeling both social stressors and environmental exposures) from studies like these, DEC can determine a general added risk of living in a disadvantaged community. This approach offers a strong scientific foundation and immediate applicability using existing literature, though generalizability may be limited due to gaps in pollutant-specific data.

A second method would involve using New York State health and environmental datasets to measure how much health risk increases for residents of disadvantaged communities compared with others. This excess risk could then serve as an empirically derived scale factor for adjusting benchmark thresholds. While this approach ensures relevance to New York's population, it depends on the availability of granular, high-quality data, which is not consistent across all health indicators in the state, as noted above.

A third, longer-term approach involves conducting integrated stressor modeling to identify which specific social and environmental variables, taken from the DAC stressors list, most strongly influence compounded health risk. Though data-intensive, this would allow DEC to refine and update the adjustment factor over time as new evidence and datasets become available.

[11] Kristin M. Osiecki et al., *Utilizing Exploratory Spatial Data Analysis to Examine Health and Environmental Disparities in Disadvantaged Neighborhoods*, 6 ENV'T JUSTICE 81 (2013), https://www.liebertpub.com/doi/10.1089/env.2013.0010; Jessie L.C. Shmool et al., *Social stressors and air pollution across New York City communities: A spatial approach for assessing correlations among multiple exposures*, 13 ENV'T HEALTH (2014), https://doi.org/10.1186/1476-069X-13-91; Sacoby Wilson et al., *Assessment of sociodemographic and geographic disparities in cancer risk from air toxics in South Carolina*, 140 ENV'T RSCH. 562 (2015), https://doi.org/10.1016/j.envres.2015.05.016.

C. "Significant Increase" in Pollution for Renewal or Modification Permits

DEC question #5: What constitutes a significant increase in the existing disproportionate pollution burden?

Whether a permit for renewal or modification can be issued under the "significant increase" permitting standard will depend substantially on how the baseline pollution is measured. We urge DEC to specify in its regulations that the baseline against which to measure the project's expected pollution should *not* include the existing facility's current pollution. One approach DEC could take would be to state that the baseline should be equivalent to the "no action" alternative. For example, if DEC were considering an application to renew an operating permit for a polluting facility, the baseline would be measured based on the DAC's pollution burden if the existing facility were no longer there; the "no action" alternative would be no permit renewal, so the facility would have to cease operations. In contrast, if DEC were considering an application to expand an existing facility, the baseline would be set based on the DAC's current pollution burden including the existing facility; the "no action" alternative would be no expansion, but presumably the facility would continue to operate at its current capacity.

Permit processes under the National Environmental Policy Act (NEPA) can serve as an example for DEC. Federal courts have noted, in "many NEPA cases the baseline was expressed as the 'no-action' alternative."[12] One federal case in particular illustrates why this approach would be consistent with DEC's mandate under the EJ Siting Law. In *Ohio Valley Environmental Coalition v. Hurst*, the Army Corps of Engineers re-issued a nationwide permit related to mountaintop mining after the previous permit had expired. The plaintiffs challenged the new permit as violating NEPA. The court concluded that the Corps failed to consider the effects of past actions under its previous nationwide permits: "The Corps' obligation to consider the ongoing effects of past actions is part of its statutory obligation to consider cumulative impacts under NEPA."[13] The court wrote,

> These losses and impacts do not exist in a vacuum; they are not corrected or cured every five years with the renewal of a new nationwide permit. **Nor do these accumulated harms become the baseline from which future impacts are measured.** Before authorizing future activities with such tremendous impacts, the Corps must at least consider the present effects of past activities, which are not, in my common sense judgment, likely to have been successfully mitigated to insignificance.[14]

Establishing the baseline for permit renewals and modifications as the "no action" alternative would ensure that the "significant increase" permitting standard still serves to protect DACs from disproportionate pollution burdens as the EJ Siting Law requires.

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[12] *See, e.g.*, League to Save Lake Tahoe v. Tahoe Regional Planning Agency, 739 F. Supp. 2d 1260 (E.D. Cal. 2010).
[13] Ohio Valley Env't Coalition v. Hurst, 604 F. Supp. 2d 860, 887 (S.D.W.V. 2009).
[14] Ohio Valley Env't Coalition v. Hurst, 604 F. Supp. 2d 860, 887 (S.D.W.V. 2009) (emphasis added).

D. Mitigation or Permit Conditions

DEC question #6: What might be considered suitable mitigation or permit conditions when evaluating proposals for minimization of impacts from projects and/or overall reduction of burdens in potentially impacted DACs?

As we noted in our comments on DEC's proposed regulations to implement the EJ Siting Law's SEQRA amendments,[15] we urge DEC to adopt a hierarchy of mitigation measures when imposing permit conditions.

An appropriate mitigation hierarchy would require, in the following order: (i) consideration of all feasible measures to avoid contributions to pollution in the DAC; (ii) where avoidance is not feasible, consideration of all feasible measures to minimize pollution contributions; and (iii) under appropriate circumstances, provide an additional environmental benefit within the DAC. Such appropriate circumstances could include the introduction of a new or expansion of an existing source of pollution in the DAC.

Critical to the success of any hierarchy is avoiding the allowance of "offsets" if there are feasible avoidance and minimization measures. For example, under this hierarchy it would be appropriate for a facility to propose replacement of a less efficient boiler at the same facility to reduce its emissions of PM2.5 as part of any overall project that might otherwise increase PM2.5 emissions from another source(s), provided it resulted in an overall facility-wide reduction in PM2.5 emissions. Conversely, we would not support an approach that allowed for the PM2.5 reductions from the boiler upgrade to act as a justification (offset) for not requiring feasible avoidance or minimization measures for other pollutant contributions. If NYDEC is to meet its statutory duty to reduce pollution burdens within DACs, it must ensure that feasible reduction measures are pursued for each relevant pollutant.

E. Defining "Essential Environmental, Health or Safety Need"

DEC question #7: What types of facilities should be considered as an essential environmental, health or safety need?

To implement the provision of the EJ Siting Law that allows DEC to waive the requirement to prepare an existing burden report for renewal or modification applications, we recommend that DEC adopt a standard for identifying facilities that serve an essential need rather than providing an exhaustive list of eligible facilities. Social science literature on critical infrastructure provides a helpful reference point for DEC when setting this standard. In particular, literature focusing on

[15] *Available at* https://climate.law.columbia.edu/sites/climate.law.columbia.edu/files/content/INCITE%20Network%20-%20Comments%20on%20Proposed%20Part%20617%20%28May%207%2C%202025%29.pdf.

social infrastructure—or, facilities that serve the "social well-being" of a community[16]—may supply an appropriate standard.

For example, one study defines essential needs as "[t]he accessibility of services such as education, health care, food, and cultural amenities [that are] crucial for a community's vitality, livability, and cohesion" and notes that "every community will have different service they consider essential" which "reflect the local and cultural needs."[17]

Consistent with the statutory language that the facility would serve an "essential environmental, health, or safety need *of the disadvantaged community*," the standard should emphasize that only facilities which narrowly serve the needs of the community would qualify for this existing burden report waiver. For example, a facility like a landfill, which serves the needs of an entire region but only burdens the DAC, would not meet the criteria for a waiver. On the other hand, facilities like an elementary school or health care clinic, which specifically serve the needs of the communities in which they are located, could be considered for a waiver.

To supplement the standard, we support the inclusion of a non-exhaustive list of facilities that would be automatically granted a waiver if under a certain size (for example, 20,000 square feet). These might include:

- Health care facilities, such as hospitals or urgent care clinics.
- Fire, rescue, and ambulance services, and associated infrastructure.
- Designated earthquake, hurricane, or other emergency shelters.
- Homeless shelters and affordable housing.
- Community social and educational facilities, such as schools, community centers, libraries, and houses of worship.
- Supermarkets and other facilities to support access to food.[18]

DEC could also consider including a non-exhaustive list of facilities that would be automatically required to prepare an existing burden report and would not be considered for a waiver. These might include:

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[16] *See* Fabio De Felice et al., *Critical Infrastructures Overview: Past, Present and Future*, 14 SUSTAINABILITY (2022), https://doi.org/10.3390/su14042233; *see also* Thomas Matte et al., *NPCC4: Climate Change and New York City's Health Risk* (2024), https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.15115.

[17] Tom M. Logan & Seth D. Guikema, *Reframing Resilience: Equitable Access to Essential Services*, 40 RISK ANALYSIS 1538 (2020), https://onlinelibrary.wiley.com/doi/full/10.1111/risa.13492.

[18] This list was compiled using various sources defining essential needs and essential public facilities, including state laws and social science literature. *See e.g.*, Oregon Structural Specialty Code, Table 1604.5; Tom M. Logan & Seth D. Guikema, *Reframing Resilience: Equitable Access to Essential Services*, 40 RISK ANALYSIS 1538 (2020), https://onlinelibrary.wiley.com/doi/full/10.1111/risa.13492; Hamid Ravaghi et al., *Scoping Review of Community Health Needs nd Assets Assessment: Concepts, Rationale, Tools and Uses*, 23 BMC HEALTH SERVS. RSCH. (2023), https://link.springer.com/article/10.1186/s12913-022-08983-3#Sec24; Fabio De Felice et al., *Critical Infrastructures Overview: Past, Present and Future*, 14 SUSTAINABILITY (2022), https://doi.org/10.3390/su14042233; Thomas Matte et al., *NPCC4: Climate Change and New York City's Health Risk* (2024), https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.15115.

- Warehouses and major transit hubs, such as airports or bus depots.
- Landfills and waste or wastewater treatment facilities.
- Peak power plants and liquefied natural gas terminals.

As a general matter, we urge DEC to construe "essential need" narrowly when considering whether to waive the requirement to prepare an existing burden report. We recognize that this requirement will strain DEC's capacity but we believe there are other effective ways to manage its workload. For example, we would support DEC regulations that would allow applicants to jointly prepare an existing burden report for projects in the same DAC, or to rely on an existing burden report that was recently prepared for the same DAC by another applicant.

We appreciate the opportunity to submit this input. We hope that these comments will enhance DEC's ability to meet the mandate of the EJ Siting Law and we welcome any further discussion or engagement beneficial to DEC in its efforts.

Sincerely,

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