

Preliminary Analysis by DEFEND OUR HEALTH  
of Shortcomings in Proposed Revisions to Federal Regulations for the  
**National Emission Standards for Hazardous Air Pollutants (NESHAP) for  
the Synthetic Organic Chemical Manufacturing Industry (SOCMI),**

also known as the Hazardous Organic NESHAP (or HON) rule,  
by the U.S. Environmental Protection Agency pursuant to the Clean Air Act  
24 April 2023

**Summary.** The proposed HON rule, while long over-due and a major step in the right direction, falls far short of meeting the environmental justice commitments of the Biden Administration and the requirement to protect human health from toxic air emissions under the Clean Air Act. This rule, *assuming it's timely adopted as proposed without any weakening changes*, would:

1. Perpetuate **environmental racism** by leaving more than 1.6 million Black and Brown resident, representing 64% of the impacted community, facing serious cancer risk;
2. Only reduce the number of people facing **serious cancer risk** by 21% and those facing **significant cancer risk** by 75%, contrary to EPA policy to strive to eliminate such risk<sup>1</sup>;
3. Fail to limit future increases in toxic air emissions due to **petrochemical plastics**, which drive most chemical manufacturing, with production projected to double in next decade;
4. Fail to **sufficiently reduce toxic fugitive emissions** by not requiring all available control technologies, e.g., leakless equipment, infrared monitoring, and automated leak detection.

[Individual lifetime cancer risk is “serious” at the 1 in 1 million risk level, “significant” at the 10 in 1 million risk level, and “unacceptable” at or above 100 in 1 million risk level. See below.]

**Background.** The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to further reduce industrial air emissions of hazardous air pollutants (HAPs) if the residual health risks remaining after technology-based controls are applied still exceed the 1 in 1 million level for cancer risk to the maximum exposed individual over their lifetime. 42 U.S.C. §7412(f)(2)(A). Under a court-ordered timeline, EPA recently reassessed cancer and other health and environmental risks, as well as the current state of air pollution control technology, for more than 50 different HAPs emitted by about 200 synthetic organic chemical manufacturing plants in the United States, many of which are located in Texas and Louisiana.

Finding that the trigger level for cancer risk (and other risks) was exceeded, EPA announced its intent to revise its so-called HON rule to significantly reduce toxic air emissions from the synthetic organic chemical manufacturing industry.<sup>2</sup> On April 6, 2023, a pre-publication version

---

<sup>1</sup> In EPA's landmark benzene NESHAP adopted in 1989, which was memorialized by the Clean Air Amendments of 1990, the agency stated: “In protecting public health with an ample margin of safety under section 112, EPA strives to **provide maximum feasible protection** against risks to health from hazardous air pollutants by (1) **protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately 1 in 1 million** and (2) limiting to approximately no higher than 1 in 10 thousand [100 in 1 million] the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years.” (emphasis added) (54 FR 38044).

<sup>2</sup> U.S. Environmental Protection Agency (April 6, 2023). Biden-Harris Administration Proposes to Strengthen Standards for Chemical and Polymer Plants, Dramatically Reduce Cancer Risk from Air Toxics. News Release.

of EPA's analysis and proposed rule was posted on EPA's website.<sup>3</sup> A public hearing will be scheduled some time in May, with the date set 21 days following the formal publication of the proposed rule revision in the Federal Register, as part of a 60-day public comment period.

**Benefits of Proposed Rule.** To EPA's credit, and notwithstanding the major shortcomings detailed further below, the proposed rule advances several provisions that advance the aim of improving public health and environmental justice, which include:

- Significant reductions in HAPs emissions through new mandatory controls on sources;
- Even tighter controls on ethylene oxide (EtO), a very potent, known human carcinogen;
- Elimination of cancer risk above the 100-in-one-million risk level for 87,000 people;
- A 91% reduction in cancer risk for 342,000 people above the 50-in-one-million risk level;
- An 80% reduction in overall cancer incidence, i.e. the number of likely cancer cases;
- Tighter controls on flares designed to burn off toxic gases instead of being released;
- Closing the loophole that allows releases during start-up, shut-down and maintenance;
- Mandatory fence-line monitoring for six HAPs, with action levels that trigger more; and
- A community-wide risk assessment of combined risk from other sources and industries;

**Shortcomings of Proposed Rule.** Despite these projected gains, the proposed rule would fail to fully meet the goals and requirements of environmental justice and clean air policies. (And that's assuming that the proposed rule is timely adopted and enforced without weakening changes that result from chemical industry lobbying and delays from industry lawsuits.)

The following critical deficiencies must be corrected before EPA adopts a final HON rule:

## **1. The Proposed Rule Would Perpetuate ENVIRONMENTAL RACISM, Contrary to the Environmental Justice Policies of the Biden Administration and U.S.**

**About 1.6 million people of color would still face serious cancer risk** at the one-in-one-million level simply by living within 10 kilometers (6.2 miles) of toxic air emissions emitted by regulated sources from chemical manufacturing plants, *after adoption of the proposed rule.*<sup>4</sup>

**People of color represent 64% of the total population at serious risk of cancer** (at the one-in-one-million level), after controls are in place on HAPs emissions from 111 chemical

---

<https://www.epa.gov/newsreleases/biden-harris-administration-proposes-strengthen-standards-chemical-and-polluters-plants>

<sup>3</sup> U.S. Environmental Protection Agency (April 6, 2023). Proposed Rule (pre-publication version). Synthetic Organic Chemical Manufacturing Industry: Organic National Emissions Standards for Hazardous Air Pollutants (NESHAP) - 40 CFR 63 Subparts F, G, H, I.

<https://www.epa.gov/stationary-sources-air-pollution/synthetic-organic-chemical-manufacturing-industry-organic-national>

<sup>4</sup> Ibid. Table 31, page 382. As many as 3.6 million people of color could face serious cancer risk if they live within 50 kilometers (31 miles) of a regulated chemical plant but EPA has not yet released its demographic analysis to confirm the proportion of the larger population at risk of cancer at the 1 in 1 million level who are people of color.

plants.<sup>5</sup> That disproportionate impact is more than 1.5 times the national average since people of color make up about 40% of the U.S. population.

Latinx community residents, who make up 37% of this at-risk population, are over-represented at nearly twice the national average of 19% of the U.S. population. About 917,000 Latinx residents would still face serious cancer risk if the HON rule was adopted as proposed. This represents only a 4% reduction in the number of people at serious risk of cancer after rule adoption.

African-American community residents, who make up 23% of this at-risk population, are over-represented at nearly twice the national average of 12%. About 583,000 Black people would still face serious cancer if the HON rule was adopted as proposed. This represents only a 16% reduction in the number of people at serious risk of cancer after adoption of the proposed rule.

People would also remain disproportionately at-risk of cancer based on socio-economic status if they lived within about 6.2 miles of a regulated chemical plant. For those who would still face serious cancer risk at the 1 in 1 million level after regulation:

- 18% (or 474,000 people) live in poverty compared to national average of 13%;
- 20% (or 513,000 people) have a low educational level (i.e., are more than 25 years old and without a high school diploma) compared to national average of 12%; and
- 9% (or 214,000 people) are linguistically isolated compared to 5% nationally.<sup>6</sup>

For the 29,000 people who live within 10 km (6.2 miles) of 13 chemical plants and would still face a *fifty-times higher cancer risk* (50-in-one-million) after controls are imposed:

- 46% (or 14,281) are people of color, still above the national average of 40%; and
- 29% (or 9,000 people) are Latinx residents, compared to 19% national average.<sup>7</sup>

In its analysis of the proposed HON rule, EPA succeeds at *identifying* environmental justice concerns,<sup>8</sup> consistent with Executive Order 12898, which states:

“To the greatest extent practicable and permitted by law ... each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.”<sup>9</sup>

However, contrary to environmental justice policies and Clean Air Act requirements, EPA fails to adequately *address* environmental justice concerns.

---

<sup>5</sup> Ibid. Table 31, page 382.

<sup>6</sup> Ibid. Table 31, pages 382-3.

<sup>7</sup> Ibid. Table 32, pages 383-4.

<sup>8</sup> Ibid. Pages 368-409.

<sup>9</sup> The President, Executive Order 12898 (February 11, 1994). Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations.

<https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>

EPA defines 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.” EPA defines the concept further: “[F]air treatment means **no group of people should bear a disproportionate share of the negative environmental consequences** resulting from industrial, governmental and commercial operations or policies.”<sup>10</sup> (emphasis added)

Yet, as documented above, people of color will still bear a disproportionate share of exposure to hazardous air pollutants and resulting cancer risk if the HON rule is adopted as proposed.

Further, EPA’s fails to cite and analyze the scientific evidence that shows that people of color are also uniquely susceptible to the health effects of toxic air pollutants, in addition to being more highly exposed, due to the cumulative impacts from a combination with other psycho-social stressors including racism, poverty, lack of access to health care and healthful foods, and more.<sup>11</sup>

Under the Clean Air Act, the unique susceptibility of people of color and low-income people to the adverse effects of hazardous air pollutants should be considered as important health factors. Under EPA’s benzene NESHAP decision, “all of the health factors” must be considered as “EPA strives to provide protection to the greatest number of persons possible to an individual lifetime risk no higher than approximately 1 in 1 million.”<sup>12</sup>

***Recommendation:*** *The proposed HON rule should be strengthened to further reduce hazardous air emissions with the goal of eliminating racial disparities in exposure at all risk levels.*

## **2. Under this Proposal, 5.7 million People would still face SERIOUS CANCER RISK from Exposure to Toxic Air Emissions, Contrary to Clean Air Act Requirements**

Under the proposed rule, serious cancer risk would remain, exposing an estimated 5.7 million people who live within 50 kilometers (31 miles) to lifetime cancer risks of one-in-one-million. (See Table 1 below.) The rule would result in a very modest 21% reduction in the total number of people at this risk level, which would be reduced from 7.2 million to 5.7 million from implementing the rule as proposed.<sup>13</sup>

The proposed rule would achieve only a 75% reduction in the number of people exposed to a significant cancer risk, leaving 570,000 people at that risk level. Under California law, significant risk is defined as a 10 in 1 million lifetime risk level. (See Table 1 and Footnote 16.)

---

<sup>10</sup> U.S. Environmental Protection Agency, Environmental Justice: Learn About Environmental Justice, <https://www.epa.gov/environmentaljustice/learn-about-environmental-justice>

<sup>11</sup> See, for example, Morello-Frosch et al. (2011). Understanding the Cumulative Impacts of Inequalities in Environmental Health: Implications for Policy. *Health Affairs*. 30(5):879-887. <https://pubmed.ncbi.nlm.nih.gov/21555471/>

<sup>12</sup> U.S. Environmental Protection Agency (1989). National Emission Standards for Hazardous Air Pollutant; Benzene. 54 FR 38046.

<sup>13</sup> EPA, Proposed Rule, Table 5, page 151.

For people who live even closer to the chemical plants, within 10 km (6.2 miles), the risk reduction would be even less. Only 10% fewer people would be exposed at the one-in-one-million cancer risk level, reducing the at-risk population from 2.8 million to 2.5 million.<sup>14</sup>

**Table 1. EPA’s proposed rule would still leave millions of people at serious risk of cancer**

Hazardous Air Pollutant Emissions from Synthetic Organic Chemical Manufacturing Industry	Lifetime Cancer Risk for People who Live within 50 km (31 miles) of the Chemical Manufacturing Plants (cancer risk expressed as number in one million)					Cancer Incidence (in cases per year)
	≥ 1	≥ 10	≥ 100	> 100	≥ 1,000	
<b>Cancer Risk Level:</b>	<b>Serious</b> <sup>15</sup>	<b>Significant</b> <sup>16</sup>	<b>Unacceptable</b> <sup>17</sup>			
BASELINE - Number of People at Risk (before HON rule)	7.2 million	2.3 million	150,000	87,000	2,900	2
POST-CONTROL Number of People at Risk (after rule)	5.7 million	570,000	4,700	0	0	0.4
REDUCTION in the At-Risk Population (by proposed rule)	21 %	75 %	96 %	100 %	100 %	80 %

EPA has done more in the past to reduce serious cancer risks from hazardous air pollutants. For example, EPA’s NESHAP reduced cancer risks from benzene emissions from storage tanks to less than 1 in 1 million for 99% of the entire population that lived with 50 kilometers (31 miles) of the air toxics source.

<sup>14</sup> Ibid. Table 31, page 382.

<sup>15</sup> **“Serious”**: The Clean Air Act Amendments of 1990 require that if technology-based standards for hazardous air pollutants “do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a source in the category or subcategory to less than one in one million,” then EPA must adopt emission standards that provide an ample margin of safety to protect public health, considering costs and feasibility. See 42 U.S.C. §7412(f)(2). Further, precedent-setting EPA policy adopted with the Benzene NESHAP in 1989 states that: “EPA strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately 1 in 1 million”. 54 FR 38044-5.

<sup>16</sup> **“Significant”**: A California state law, The Safe Drinking Water and Toxic Enforcement Act of 1986 (commonly referred to as Prop 65), requires warning of exposures to chemicals that pose a significant risk of cancer assuming lifetime exposure. The implementing regulations state that: “For chemicals assessed in accordance with this section, the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure at the level in question.” More than that risk level, which is equivalent to a ten in one million, poses significant cancer risk. See 27 CCR §25703(b).

<sup>17</sup> **“Unacceptable”**: The EPA presumptively defined an unacceptable cancer risk in its final adoption of the NESHAP for emissions of benzene, a known human carcinogen in 1989: “EPA will generally presume that if the risk to that individual is no higher than approximately 1 in 10 thousand is considered acceptable ...” (That’s equivalent to a 100 in 1 million cancer risk level.) However, “EPA may find, in a particular case, that a risk that includes MIR (maximum individual risk) less than the presumptively acceptable level is unacceptable in light of other health risk factors.” See 54 FR 38045. This EPA interpretation was preserved by the Clean Air Amendments of 1990. See 42 U.S.C. §7412(f)(2)(B).

However, the proposed HON rule would provide an equal level of health protection from cancer risk to only 89% of the surrounding population of 50 million people who live the same distance away from regulated chemical manufacturing plants. (See Table 2 below.)

According to Table 2, after controls are imposed, the proposed HON rule would also result in:

- Ten times the rate of cancer incidence compared to the benzene rule; and
- Fifty-seven times the number of people at serious cancer risk than the benzene rule.

**Table 2. The proposed risk reduction is much weaker than EPA’s landmark benzene decision**

Residual Cancer Risk, People who Live within 50 km (31 miles) of Emission Sources, Post-Control				
Carcinogen and Source	Number of People Who Remain at Risk at > 1 in 1 million	Percent of Total Population Protected at < 1 in 1 million	Cancer Incidence Remaining (in cases per year)	Date and Status of EPA decision
Benzene from storage tanks	0.1 million	99 %	0.04	1989 Final
HAPs from SOCMIs plants	5.7 million	89 %	0.40	2023 Proposed

***Recommendation:** The proposed HON rule should be strengthened to further reduce toxic air emissions so that the number of people exposed at or above 1 in 1 million cancer risk is eliminated or reduced to the maximum extent feasible.*

### **3. Rising Demand for PETROCHEMICAL PLASTICS Will Increase Toxic Air Emissions, Cancer Risk, and Environmental Racism from Chemical Plants**

Supplying the ever-increasing production of petrochemical plastics drives the production of synthetic organic chemicals and its emissions of hazardous air pollutants.

The manufacture and use of just seven hazardous chemicals by the chemical industry results in air emissions that contribute 90% of the cancer incidence projected to result *after* the HON rule is adopted as proposed.<sup>18</sup>

Every one of these chemicals is used to make petrochemical plastics and/or plastics additives. (See Table 3 below and Wikipedia entries on “Uses” for each of the seven chemicals.)

Residual emissions of ethylene oxide (EtO), after proposed controls are imposed, drives nearly two-thirds of the projected cancer incidence. The majority of EtO supplies the production of

<sup>18</sup> U.S. Environmental Protection Agency (March 2023). Residual Risk Assessment for the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Source Category in Support of the 2023 Risk and Technology Review Proposed Rule. Table 3-3.1, page 59.  
[https://www.epa.gov/system/files/documents/2023-04/SOCMI\\_RTR\\_risk\\_assessment\\_report\\_withAppendix\\_31M\\_arch2023\\_ToDocket.pdf](https://www.epa.gov/system/files/documents/2023-04/SOCMI_RTR_risk_assessment_report_withAppendix_31M_arch2023_ToDocket.pdf)

polyethylene terephthalate (PET) plastic, known in its fiber form as polyester.<sup>19</sup> Together, plastic bottles (mostly for beverages) and polyester clothing consumer about half of all PET plastic use.

**Table 3. Plastics Production Drives Cancer-Causing Air Emissions from the Chemical Industry**

Hazardous Air Pollutant	Contribution to Cancer Incidence	Primarily Used for Plastics?	Some of the Plastics Made with this Chemical	Major End Markets
Ethylene oxide (EtO)	61 %	YES	PET resin and polyester fiber	Bottles and clothes
Naphthalene	7 %	YES	Phthalate plasticizers; alkyd resins	Flexible vinyl; paints
1,3-Butadiene	6 %	YES	Synthetic rubbers (several)	Tires, hoses, belts, etc.
Acrylonitrile	5 %	YES	PAN, ABS, SAN, ASA; rubbers	Many consumer goods
Benzene	4 %	YES	Polystyrene, phenolic resins, nylon	Packaging, many other
Ethylene dichloride (EDC)	4 %	YES	PVC (vinyl)	Building materials, etc
Chloroprene	3 %	YES	Neoprene rubber	Wetsuits, consumer

The production of plastics, which has grown exponentially, is projected to double again by some time in the next decade.<sup>20</sup> That means that related chemical production and its associated air emissions are also likely to double within ten to fifteen years.

In developing its proposed HON rule, EPA improperly failed to consider trends in plastic production and the likelihood that the hazardous air emissions it proposes to partially control will significantly increase in the near future. These increases will erode the health protections advanced by the proposed HON rule. Since a significant portion of the use of plastics is problematic or unnecessary,<sup>21</sup> EPA should take action to curb plastics-related chemical production and associated emissions of hazardous air pollutants.

***Recommendation:** EPA should assess future emissions of hazardous air pollutants based on industry's projected growth rates in plastics and chemical manufacturing. To offset these projected increases, EPA should impose caps on chemical production and total emissions of hazardous air pollutants.*

#### **4. The Proposed Rule Fails to Further Reduce TOXIC AIR EMISSIONS by not Requiring Use of Available Technologies that Prevent Equipment Leaks**

The proposed HON rule would only reduce by 70% to 74% the so-called fugitive emissions of hazardous air pollutants from leaking equipment at chemical manufacturing plants.<sup>22</sup> This

<sup>19</sup> Defend Our Health (2022). Problem Plastic: How Polyester and PET Plastic and Can Be Unsafe, Unjust, and Unsustainable Materials, page 18. <https://defendourhealth.org/campaigns/plastic-pollution/problem-plastic/>

<sup>20</sup> Geyer, R., Jambeck, J.R. and Law, K.L. (2017) Production, use, and fate of all plastics ever made. *Science Advances*, 3, 3–8. <https://doi.org/10.1126/sciadv.1700782>

<sup>21</sup> Pew Charitable Trusts, SystemIQ (2020). Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Toward Stopping Ocean Plastic Pollution. [https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave\\_report.pdf](https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf); U.S. Plastic Pact (2022). U.S. Plastics Pact's Problematic and Unnecessary Materials List. <https://usplasticspact.org/problematic-materials/>

<sup>22</sup> EPA, Proposed Rule, Table 4, Page 149.

pollution control rate compares poorly to the 93 % to 99.9% reductions projected from other six other sources of hazardous air emissions such as process vents and wastewater systems.

A typical chemical plant has thousands of equipment connections, each of which routinely leaks, more so if in poor working condition, resulting in significant emissions of hazardous air emissions. On average, an oil refinery or chemical plant will have 12,000 connectors; 7,400 valves; 560 open-ended lines, 100 pumps, 90 pressure relief valves, and 80 sampling connections.<sup>23</sup> Collectively, emissions from leaking equipment are considered “fugitive” emissions, and are often a major source of uncontrolled air pollution.

For its proposed rule, EPA acknowledges that several technologies are used by other industries that could be required in this rule to further reduce hazardous air emissions, especially of ethylene oxide, from leaking equipment. These include requiring the:

- Use of “leakless” (i.e., low-emitting) equipment for valves and pumps;
- Use of optical gas imaging (OGI) (i.e., use of a thermal infrared camera) to find larger leaks faster; and
- Use of leak detection sensor networks (LDSNs) that could potentially identify leaks.<sup>24</sup>

However, in the proposed HON rule, EPA has failed to analyze or require these technologies to further reduce emissions from leaking equipment, but instead weakly asks for comment on whether they should be required and under what conditions, while instead proposing only that chemical plants monitor monthly and manually for equipment leaks.<sup>25</sup>

***Recommendation:*** *In its final rule, EPA should require chemical manufacturers to deploy all available technologies to further reduce emissions of hazardous air pollutants, especially of ethylene oxide. Infrared monitoring and a smart array of leak detectors should be implemented immediately. Leakless equipment could be phased in over time, and made mandatory during turnarounds when plants are shut down for upgrades and major maintenance.*

---

<sup>23</sup> U.S. Environmental Protection Agency (2007). Leak Detection and Repair: A Best Practices Guide. <https://www.epa.gov/compliance/leak-detection-and-repair-best-practices-guide>

<sup>24</sup> EPA, Proposed Rule, Page 412. See also Footnote 174, cited therein.

<sup>25</sup> Ibid. Pages 411-12.