



State of Oregon Department of Environmental Quality

## Written Comments

July 10 2019, Cleaner Air Oregon Hazard Index 2019  
Advisory Committee Meeting

### Commenters

Name	Representing
Christine Kendrick	City of Portland
Diana Rohlman, PH.D. Susan Katz, MD Jessica Nischik-Long, MPH	Oregon Public Health Association Physicians for Social Responsibility Oregon Public Health Association
Kathrine Salzman Jessica Applegate	Eastside Portland Air Coalition
Kathryn VanNatta	Northwest Pulp and Paper Association
Paul Lewis Jae P. Douglas	Clackamas, Multnomah and Washington Counties
Sharla Moffett	Oregon Business & Industry (OBI)
Steven A. Anderson	City of Salem Neighborhood Associations
Thomas R. Wood	Stoel Rives
Tori Cole Mark Riskedahl Huy Ong Lisa Arkin	Neighbors for Clean Air Northwest Environmental Defense Center OPAL Environmental Justice Oregon Beyond Toxics



## Bureau of Planning and Sustainability

Innovation. Collaboration. Practical Solutions.

July 29, 2019

Delivered via electronic mail to: [Keith.Johnson@state.or.us](mailto:Keith.Johnson@state.or.us)

Attn: Keith Johnson, Cleaner Air Oregon Program Manager  
Oregon Department of Environmental Quality

### **RE: Written comments regarding July 10, 2019 Non-Cancer Hazard Index Rulemaking Advisory Committee Meeting**

Dear Keith Johnson,

The purpose of this letter is to follow up on the July 10, 2019 Cleaner Air Oregon (CAO) Non-Cancer Hazard Index Rulemaking Advisory Committee Meeting convened to:

- Provide information and grounding for evaluating Oregon's Hazard Index for noncancer health effects as proscribed by Oregon legislature (SB 1541)
- Provide input regarding the State's proposed approaches to designating chemicals requiring a more health protective compliance threshold for reducing noncancer health risks.

This letter highlights important concepts and considerations Oregon Department of Environmental Quality (DEQ) and Oregon Health Authority (OHA) should keep in mind to ensure public health protection and improved accountability.

### **Technical Advisory Committee**

SB 1541 allows the Environmental Quality Commission (EQC) to set lower allowable risk levels for certain chemicals expected to have developmental or other severe human health effects after convening and receiving information from a Technical Advisory Committee (TAC) composed of persons with technical expertise in toxic air contaminant risk assessment. DEQ and OHA followed this process with the TAC convened in October and December 2018. It is unclear how DEQ should consider recommendations from this additional Rulemaking Advisory Committee. We strongly encourage consideration of the TAC comments and recommendations well documented in the publicly available meeting notes.

### **Option 1 is Most Protective of Public Health**

Option 1 with all 184 contaminants with noncancer health effects regulated at the same Risk Action Level (RAL) of a Hazard Index (HI) at 3 is most protective of public health compared to Option 2. An HI of 1 is truly the most protective RAL for public health. However, given the



City of Portland, Oregon | Bureau of Planning and Sustainability | [www.portlandoregon.gov/bps](http://www.portlandoregon.gov/bps)  
1900 SW 4th Avenue, Suite 7100, Portland, OR 97201 | phone: 503-823-7700 | fax: 503-823-7800 | tty: 503-823-6868

*Printed on 100% post-consumer waste recycled paper.*

limitations placed on risk thresholds by SB 1541, Option 1 as proposed by the TAC is the most health-protective option available.

As discussed by the TAC, there is no available science-based approach to define “other severe human health effects”. All noncancer human health effects from chemicals can be considered severe depending on the person, dose, environment, and a wide range of factors affecting vulnerability and sensitivity. The TAC did not make a majority recommendation on severe. Option 2 makes a designation for developmental or reproductive health effects but no other severe human health effects.

### Resources and Transparency

To implement CAO, DEQ and OHA need to work within legislatively, appropriated program resources. Option 1 has simpler risk calculations compared to Option 2 which would reduce DEQ’s administrative work to review and manage risk analyses, permits, and enforcement. Communication of Option 2 results and risk allowances for permits would also require increased costs and time for public engagement which DEQ is responsible for within CAO. Communication of method two would take more time and resources to explain and most likely result in additional follow up questions to work through with the public.

Transparency, accessibility and accountability are important to public health protection and should be considered when developing rules. Communication with the public needs to be direct and clear. Simpler risk calculations will allow for more efficient information sharing and can help support increased public understanding. Transparency also improves the ability to evaluate effectiveness of the CAO program, another requirement on DEQ’s resources to implement CAO.

---

Given the limitations SB 1541 overlaid on CAO, Option 1 is the best method available to protect public health from severe noncancer health impacts. This approach also improves accountability and requires less resources for DEQ.

Thank you for your work in organizing this Rulemaking Advisory Committee and dedication to this process.

Sincerely,



Christine Kendrick  
Smart City PDX Coordinator/Air Quality Lead  
Bureau of Planning and Sustainability  
City of Portland





Oregon Public  
Health Association

Oregon Public Health Association  
818 SW Third Avenue, #1201, Portland, OR 97204  
[www.OregonPublicHealth.org](http://www.OregonPublicHealth.org)

Oregon Department of Environmental Quality  
Attn: Keith Johnson, Cleaner Air Oregon Program Manager  
700 NE Multnomah Street, Suite #600  
Portland, Oregon 97232

July 20, 2019

Re: Comments on Proposed Cleaner Air Oregon Rules

Dear Mr. Johnson:

Thank you for the opportunity to comment on the Cleaner Air Oregon rules relating to existing source noncancer hazard index throughout Oregon. We appreciated the questions drafted by DEQ and OHA to help guide the discussion of the committee. We have included our thoughts on each question below, along with additional comments. At the meeting on July 10, 2019, DEQ and OHA posed the following questions, in bold.

1. **Are there any additional questions about the information and options presented today?** We are grateful for the work done by DEQ and OHA; the target organ spreadsheet compiling available hazard index values is very useful. We would ask what health-based rationale exists to go with setting a higher hazard index?
2. **What are your thoughts about the options? What stands out? What is missing?** Option 1, regulating all chemicals at an HI of 3, is the most health-protective and most grounded in health-based standards. Furthermore, this option provides a clear definition of how industry will be regulated. From a community engagement standpoint, option 1 provides the most transparent method, which will help communities better understand what air toxics are being emitted, and how they are being regulated. In terms of what is missing, there was no mention of how the ultimate rule-making around hazard indices will be communicated to communities impacted by industrial air emissions. DEQ and OHA should consider working with community liaisons to determine how rule-making will be communicated.
3. **What are the important concepts and considerations that agencies should keep in mind?** OPHA believes it is important that when having discussions about hazard index, be clear about what the values mean. An HI = 1 is the level at which scientists begin to see detrimental human health effects. Increasing values mean increasing levels of risk. As shown in the slides from the meeting, HI > 1 means that air emissions may harm human health. Only when the HI < 1 does the definition state that air emissions are not expected to harm human health. This should be clearly communicated in all discussions around hazard indices.
4. **Are there additional definitions of “severe” that agencies should consider? What suggestions do you have?** We appreciated the thoughts and comments of the Technical Advisory Board, as they struggled to define what a ‘severe effect’ might be. We suggest that any “severe” effect be one that

causes adverse health effects: we offer some potential definitions here, grounded in public health and toxicology.

- Persistent and/or bioaccumulative chemicals. For example, lead, which is listed as one of the toxic air contaminants, is known to bioaccumulate within the human body [World Health Organization, 2018]. As such, bioaccumulative chemicals have the potential to be emitted at low levels but build up in the human body over time. In this scenario, a low-level chronic exposure could result in toxicity. It is also important to note that some of the toxic air contaminants on this list have no known level at which they are considered safe, lead included [World Health Organization, 2018].
- Chemicals causing long-lasting harm, to include kidney disease, hepatotoxicity and cardiovascular disease. While initial research on air quality focused on respiratory health, with acute toxicity often reversible, current research has shown long-lasting harm from exposure to air toxics [West et al., 2016]. We also note that pollution-related disease has contributed to economic losses [Landrigan 2017; Landrigan et al. 2018].
- Chemicals known to alter the epigenome and cause heritable, detrimental health effects. Emerging research shows that adult exposures can cause generational effects [Hatchwell and Grealley, 2007]. For example, this has recently been documented with mercury and arsenic [Cardenas et al., 2015; Koestler et al., 2013]
- Chemicals with behavioral health effects. It is unclear if chemicals with associated behavioral health issues, to include lead, fall under the category of developmental toxicity. For example, while there are well established examples of the danger of elevated lead exposure, less known but equally important, are the associated detrimental behavioral effects of lead exposure. Research has shown even low-level lead exposure to be correlated with increased hostility and increased incidence of depression, even in adults [Bouchard et al. 2009; Naicker et al., 2018.] This was unfortunately highlighted in 2015, following the arrest and subsequent death of Freddy Gray in Baltimore, MD [Worland, 2015].
- Chemicals with known toxicity to the endocrine system, as tested in animal models; also called endocrine disrupting chemicals.
- Chemicals known to metabolize or transform into more toxic compounds. For example, phenanthrene is a polycyclic aromatic hydrocarbon associated with increased respiratory toxicity. However, phenanthrene can be metabolized into more toxic metabolites [Pulster et al. 2017].

5. **What else should DEQ and OHA consider? We have included our thoughts on the materials provided by DEQ and OHA, as well as thoughts related to the discussion during the meeting.** Based upon our review of the Technical Advisory Committee comments, and our own experience in public health and toxicology, we strongly support the suggestion by the Committee to include reproductive toxicity effects under the category of a developmental toxin. Below are additional considerations for DEQ and OHA:

- a. *Provide transparency around how an HI is calculated for a facility.* During the meeting there was confusion related to how a facility-wide HI would be calculated. It is our understanding that there are 12 organ systems that are assessed. It is also our understanding that a single reference dose is assigned to each chemical; this dose refers to the health effect that occurs at the lowest concentration. Therefore, a chemical may affect the respiratory system, but also be a developmental toxin and cause hepatotoxicity, but will only be included in the HI calculation for the respiratory system. Providing simple examples of this may be useful moving forward, both for industries and for impacted communities.

- b. *Clearly communicate what a hazard index is, and how it addresses risk.* There was concern raised during the discussion that perhaps more science and research was needed to determine if a hazard index of 3 versus 5 should be used. As we stated during the meeting, the spreadsheet developed by DEQ and OHA is excellent, especially in connection with the inclusion criteria developed. Ultimately, this committee is not being asked to evaluate the state of the science, nor to issue a call for additional research. This committee is being asked what levels of risk the state of Oregon should impose upon its residents. From a toxicological standpoint, chemical toxicity is assessed via a standard dose response curve. There are levels at which no toxicity is observed, the lowest level at which toxicity is observed, etc. These values are not absolutes, but rather speak to increasing levels of risk. For example, we can think of aspirin. For the majority of the population, no toxicity is seen when consuming 2 aspirin every 6 hours. However, significant toxicity, up to and including death, can be seen when large amounts of aspirin are consumed. This is the crux of the discussion regarding hazard indices.

From a public health perspective, we are charged with promoting healthier, happier, longer lives. Further, we ascribe to health across the lifespan, and promoting the health of future generations. As such, knowing that risk of hazardous health effects increases past a hazard index of 1, we cannot justify using a risk level 5 times higher than where harmful effects are first seen. To that end, we recommend regulating all chemicals at a hazard index of 3.

- c. *Address concerns of regulations being overly protective.* There have been concerns raised that an HI of 5 is overly protective, due to implied assumptions within the calculations. Given the breaths of toxicities associated with a single chemical (a single chemical may be a carcinogen, endocrine disruptor and developmental toxin), we argue that a hazard index is actually insufficient to protect human health. As discussed in the meeting, a hazard index is based on the lowest concentration of a chemical known to cause toxic effects. As shown in the meeting, a chemical may have a high respiratory toxicity – this would then set the HI. However, the chemical may also have developmental, cardiovascular and behavioral effects at higher concentrations; these are not regulated by the HI toxicity system. Hypothetically, a source could emit a chemical at a concentration hazardous to a secondary toxicity endpoint; this would not be regulated as the chemical would only be ‘counted’ towards the HI maximum under its primary toxic endpoint.
- d. *Concerns around differential regulation of toxic air contaminants.* As mentioned by the Technical Advisory Board, differential regulations may push emitters to avoid chemicals regulated at an HI = 3, in favor of chemicals differentially regulated at an HI = 5. This then would shift use to chemicals perhaps in the same class, with potentially similar health effects, but with less regulation. In sum, this could result in a scenario where the regulations are being followed, but human health is negatively affected.
- e. *Ensure regulations continue to address health-based standards.* From the beginning of this process, the Cleaner Air Oregon rule-making process has been challenged to create regulations based in science, to choose health-based standards that are protective of Oregon residents. There is no one level that will be protective of all residents, yet we have the opportunity to set standards that are protective of the majority of the population, focusing specifically on children and the immunocompromised. We know that exposures in our lifetime can be passed on to our children, and their children.

As public health professionals, our membership is accustomed to fielding questions based about exposure and risk of detrimental health effects. Sadly, there is a dearth of evidence related to the toxicity of individual chemicals, and even less when analyzing chemical mixtures. DEQ and OHA have done a substantial amount of work identifying and collating hazard index values for 184 chemicals. With this database, **DEQ and OHA have a unique opportunity to utilize best available science to set health-based industrial air emissions standards.**

We appreciate the opportunity to be involved in this process. We have referred to several sources in this response – full citations are provided below.

Sincerely,



Diana Rohlman, PhD  
Healthy Environment Section  
Oregon Public Health Association



Susan Katz, MD  
Physicians for Social Responsibility



Jessica Nischik-Long, MPH  
Executive Director  
Oregon Public Health Association

## References

Bouchard MF, Bellinger DC, Weuve J, et al. Blood Lead Levels and Major Depressive Disorder, Panic Disorder, and Generalized Anxiety Disorder in US Young Adults. Arch Gen Psychiatry. 2009;66(12):1313–1319. doi:10.1001/archgenpsychiatry.2009.164

Cardenas, A., Koestler, D.C., Houseman, E.A., Jackson, B.P., Kile, M.L., Karagas, M.R. and Marsit, C.J., 2015. Differential DNA methylation in umbilical cord blood of infants exposed to mercury and arsenic in utero. Epigenetics, 10(6), pp.508-515.

Hatchwell, E. and Grealley, J.M., 2007. The potential role of epigenomic dysregulation in complex human disease. TRENDS in Genetics, 23(11), pp.588-595.

Koestler, D.C., Avissar-Whiting, M., Houseman, E.A., Karagas, M.R. and Marsit, C.J., 2013. Differential DNA methylation in umbilical cord blood of infants exposed to low levels of arsenic in utero. Environmental health perspectives, 121(8), pp.971-977.

Landrigan, P.J., 2017. Air pollution and health. The Lancet Public Health, 2(1), pp.e4-e5.

Landrigan, P.J., Fuller, R., Acosta, N.J., Adeyi, O., Arnold, R., Baldé, A.B., Bertollini, R., Bose-O'Reilly, S., Boufford, J.I., Breyse, P.N. and Chiles, T., 2018. The Lancet Commission on pollution and health. *The Lancet*, 391(10119), pp.462-512.

Naicker N, de Jager P, Naidoo S, Mathee A. Is There a Relationship between Lead Exposure and Aggressive Behavior in Shooters? *Int J Environ Res Public Health*. 2018 Jul 6;15(7):1427. doi: 10.3390/ijerph15071427. PubMed PMID: 29986448; PubMed Central PMCID: PMC6068756.

Pulster, E.L., Main, K., Wetzel, D. and Murawski, S., 2017. Species-specific metabolism of naphthalene and phenanthrene in 3 species of marine teleosts exposed to Deepwater Horizon crude oil. *Environmental toxicology and chemistry*, 36(11), pp.3168-3176.

West, J.J., Cohen, A., Dentener, F., Brunekreef, B., Zhu, T., Armstrong, B., Bell, M.L., Brauer, M., Carmichael, G., Costa, D.L. and Dockery, D.W., 2016. What we breathe impacts our health: improving understanding of the link between air pollution and health.

Worland, Justin. Cities like Baltimore Still Suffer From the Toxic Legacy of Lead Contamination. *TIME Magazine*. May 7, 2015. Available from: <https://time.com/3845837/baltimore-lead-contamination/>

World Health Organization. Lead poisoning and health. 23 August 2018. Available from: <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health>



Eastside Portland Air Coalition

July 29, 2019

RE: Comments for Hazard Index Rulemaking Advisory Committee  
Via Electronic Mail to johnson@deq.state.or.us

Dear DEQ,

Please consider the following comments when making decisions about risking community health in regard to industrial air toxics:

### **Working within the parameters of SB 1541**

A benchmark for non-cancer health impacts set at an Health Index number (HI) of 1 is the definition of health-protective.

In order to protect human health, benchmarks for ALL chemicals regulated under Cleaner Air Oregon (CAO) with non-cancer health impacts should be set at an HI of 1.

Any benchmark measuring non-cancer health impacts set above an HI of 1 will not be protective of human health and is not grounded in scientific consensus.

An HI of 5 and the proposed reduction to an HI of 3 for certain chemicals emitted by existing facilities are *by definition* not health protective and are therefore not in keeping with the original mandate of Cleaner Air Oregon.

The benchmarks set in SB 1541 were part of concessions made during legislative negotiations in order to secure funding for CAO. This was a pure policy decision with no basis in scientific and healthcare standards.

The legislature has, in this instance, tasked the agencies with protecting human health by applying a metric that is *by definition* harmful to human health. Because of these contradictory parameters, the agencies have no choice but to do the best they can to fulfill their mission and to get as close as possible to the mandate put forward in Cleaner Air Oregon: protecting public health from toxic air contaminants.

Lowering an HI from 5 to 3 will reduce the level of any contaminant in the air and will be more protective of human health. DEQ, OHA and Oregon businesses should be doing everything they can to protect our communities and ecosystems from toxic industrial chemicals.

## **Standards & Criteria: The Technical Advisory Committee**

**We support the majority opinion of the Technical Advisory Committee** to consider reproductive health effects as developmental health effects.

**We support the majority opinion of the Technical Advisory Committee** to use hazard, rather than dose, to identify toxic air contaminants with developmental or reproductive effects & to consider a toxic air contaminant to have developmental or reproductive effects even if it also causes other health effects at lower doses.

**We are not surprised the majority of the Technical Advisory Committee** noted that there is no science-based process available to determine which chemicals have “other severe human health effects.”

The unscientific nature of the policy standards set in SB 1541 was highlighted when the Technical Advisory Committee panel of expert scientists had to spend the better part of their first meeting parsing the difference between science and policy and overcoming their confusion and dismay at the unethical nature of *a mandate to protect health using metrics that are by definition harmful to human health*.

The TAC also spent a large portion of their meeting time trying to configure a working definition of the ambiguous and relative notion of “severe human health effects.” They could not, or would not, it’s hard to tell. It was not their job to interpret legislative intent, however they were convened and given the authority to establish science-based criteria for this rulemaking. The Committee’s reluctance and inability to reach a consensus on a workable definition for “severe health effects” is a disappointment.

Two TAC suggestions made during this discussion are notable:

- > Apparently the scientific term of art for “severe” health impacts is “adverse.” \*\*\*(see footnote)
- > In an attempt perhaps to call the question, a TAC member suggested the panel come up with a list of health impacts that are *not* severe. The Committee could not. It was later suggested that their inability to do so made a logical case for assigning an HI of 3 to all chemicals with non-cancer health effects.

Given their authority as field experts, the TAC could have simply decided to define “severe health effects” according to the scientific term of art: as adverse effects that are harmful to human health. And then applied the same criteria of using hazard to identify toxic air contaminants with severe health effects.

In the absence of a solid working definition of what constitutes “other severe health effects,” we believe it is essential for DEQ to err on the side of caution. It is not up to impacted individuals or communities to bear the burden of proving the severity of their physical and attendant psychological distress. It is up to the regulatory agencies and regulated industries to protect communities from harmful toxins, to prevent further harm, and to use the best available health science to do so. Where there may be uncertainty, our protective agencies must always err on the side of caution.

Nothing in SB 1541 precludes the use of the Precautionary Principle.

Since the agreed upon scientific definition of caution - in this case the HI benchmark of 1 - was rejected by the legislature (for existing facilities), it is up to DEQ to seize the option made available by the statute and reduce the HI for all 184 toxic air contaminants with non-cancer toxic reference values to the lowest level allowed by law, from 5 to 3.

### **Standards & Criteria: One Organ System or More**

**We will object to any rule that** plays hunt and peck and lowers the HI for some contaminants and not others based on the number or type of organ systems impacted.

The body is a complex living system. Separating the body into its component parts, i.e. discrete organs or organ systems, is for taxonomic and analytical purposes only and does not create a true picture of the interactive and interdependent functions of the human body. Damage the lungs, the whole body suffers; damage the kidneys, the whole body suffers, etc. Damage to one vital organ burdens the entire system and makes the whole body vulnerable to decline, disability and further disease. We might add that this is also true of the human body’s integral relationship with the health of the environment. Organs and organ systems do not function in isolation, cannot accurately be separated and are completely interdependent.

In regulatory language, a “target organ” or “organ system” is also only isolated for purely taxonomic and analytical purposes. Any justification for lowering the HI from a 5 to a 3 cannot legitimately be based on the number or type of organ/systems impacted. One affected organ system impacts the health of the whole.

In other words, please do not allow a chemical to linger at an HI of 5 because it “only” impacts one target organ or organ system. This is never the case in real life.

### **Standards & Criteria: Prioritize Protecting the Most Vulnerable**

TRVs do not take into consideration the pre-existing body burden a person may have from exposure to environmental toxins nor any physical vulnerabilities associated with previous illnesses or genetic predisposition. In these cases, severity of health impacts from toxic air

contaminants will be exacerbated. If OHA's statistics are correct - that 1 out of 2 people can expect a cancer diagnosis in their lifetime and that the primary causes of illness and death in Oregon are from pulmonary and cardiovascular diseases - these types of pre-existing vulnerabilities are ubiquitous.

Gearing regulation toward the most vulnerable populations ensures that everyone will be protected from any severe health impacts.

### **In Addition:**

Please be wary of the potential for existing industrial facilities to switch out one toxic chemical for another similar one that may have similar health impacts but less scientific data available. Or, they may choose a chemical that is similar but not regulated by CAO. DEQ can preempt these possibilities by applying an HI of 3 to all chemicals with non-cancer health impacts as allowed by statute and by calling unregulated contaminants into the program as needed.

Maintaining a current list of Toxic Risk Values for all chemicals regulated under CAO is essential.

**Eastside Portland Air Coalition supports DEQ's proposal to set a Health Index benchmark of 3 for all 184 toxic air contaminants with non-cancer TRVs for existing facilities.**

Doing so satisfies all the parameters established by the agencies for this rulemaking, being:

- Consistent with statute;
- Workable within recently adopted rules;
- Workable within legislatively appropriated program resources (e.g. limited staff and funds to operate the program; while there is a lot of toxicological research that could be done, this takes a lot of time and resources not provided by the legislature);
- A timely rulemaking.

### **\*\*\* Footnote:**

SEVERE: *adjective*, very great; intense.

ADVERSE: *adjective*, preventing success or development; harmful; unfavorable.

You might try treating this as a linguistic problem. As you know, language is the backbone of legislative intent. The legislature, perhaps unwittingly, perhaps deliberately, employed a very subjective descriptor to create a class of what are **in effect** a set of adverse human health

effects. We think this allows DEQ a lot of leeway to come up with a working definition of “severe” that is applicable within both legal and regulatory contexts, and grounded in both the mandate of Cleaner Air Oregon and the mission statements of the participating agencies. You could simply assume that the legislative intent was for you to establish a class of air contaminants that cause ADVERSE health effects; and you could righteously assume that they expected both agencies to approach this rulemaking with the utmost scientific rigor.

Comparing the definitions above, you can see how “adverse” is rightly the scientific term of art for describing the parameters of various health impacts. It is qualitative and establishes criteria for what makes something bad. “Severe” is a mostly subjective valuation, although there is probably universal agreement when it comes to the severity of certain health issues: cancer has a severe (and adverse) impact on the human body; heart disease has a severe (and adverse) impact on the human body; as with pulmonary disease - it is both severe in its impacts as well as adverse. It could be legitimately argued that if something bad is severe, it will automatically be adverse. And if something is adverse, it will also be severe. In the end, both words try to indicate how and in what manner something (a health effect) is bad. They’re not quite twins, but they are certainly very close siblings and usually turn up at all the same parties.

We recommend the agencies adopt the standard scientific language for what is colloquially referred to in SB 1451 as “severe human health effects.” It is up to industrial facilities to prove that someone’s adverse health crisis is not severe.

**We recommend DEQ and OHA look at the remaining 43 toxic air contaminants not expected to have developmental or reproductive health effects for other adverse human health effects, using the appropriate science-based term of art.**

Thank you for your time, energy and including Eastside Portland Air Coalition in this very important process.

Sincerely,

Katharine Salzmann &  
Jessica Applegate



Northwest Pulp & Paper  
ASSOCIATION

July 29, 2019

VIA EMAIL: [Macmillan.susan@deq.state.or.us](mailto:Macmillan.susan@deq.state.or.us)

Susan MacMillan  
Cleaner Air Oregon  
Oregon Department of Environmental Quality  
700 NE Multnomah Street, Suite 600  
Portland, OR 97232-4100

***RE: NWPPA Comments on Cleaner Air Oregon Hazard Index Rulemaking***

Dear Ms. MacMillan:

Thank you for the opportunity for the Northwest Pulp & Paper Association (NWPPA) to provide comment on the Cleaner Air Oregon Hazard Index Rulemaking as a member of the Rules Advisory Committee.

**NWPPA represents five Oregon mills and hundreds of employees.**

The Northwest Pulp & Paper Association (NWPPA) is a 63 year-old regional trade association representing 12 member companies and 16 pulp and paper mills and various forest product manufacturing facilities in Oregon, Washington and Idaho.

NWPPA members are at the forefront of air quality efforts. Our members have embraced technically advanced and scientifically sound controls on air emissions over the past 20 plus years. We are proud of our dedication to efficient and environmentally sound processes. We are committed to the hard work, expense and discipline it takes to contribute to our communities.

This letter is one more step in a long effort to cooperate with the department to provide additional resources and insights to address air toxics at our facilities. We have worked with the department for over three years to develop an effective enhancement to Oregon's air toxic's program.

**DEQ's proposed options 1 and 2 for changes to the Hazard Index (HI)**

**Overarching comment**

NWPPA believes that neither DEQ's HI Options 1 nor 2 align with the intent of Senate Bill 1541 (2018). The bill states developmental and other severe effects (paraphrased) should be considered when lowering the HI from 5 to 3.

Both of the Department's two proposals expand the intent of the legislation during the program implementation phase. It is important to note that the hazard index changes only apply to the start-up phase of Oregon's unique air toxics program and are a test period to allow adaptive management of Oregon's complex CAO program.

We ask that the Department consider our suggested approach outlined below.

**Specific comments and discussion**

We understand the CAO TAC proposed to reduce the enforceable HI from 5 to 3 for substances classified as having reproductive or developmental toxicity in order to provide additional protection to fetuses and children. However, of the 141 substances that are affected by this proposal, only 26 substances have a toxicity value defined by a developmental or reproductive outcome.

If the intent of the proposed reduction in enforceable HI is to protect against reproductive and developmental outcomes to an HI of 3, then toxicity values for reproductive and developmental outcomes should be used as a starting point for this adjustment. For substances that are regulated based on endpoints other than reproductive or developmental toxicity, it is because other significant toxicological outcomes have been found to occur at doses lower than reproductive or developmental outcomes. The result is that the concentration of a substance that relates to an HI of 3 for reproductive and developmental outcomes may actually be less stringent than an HI of 5 related to the toxicological endpoint that occurs at the lowest dose.

Below is an example of our reasoning using carbon disulfide.

Carbon disulfide		
CAO TRV (based on neurological endpoint)	800	ug/m3
Concentration at HI 5*	4000	ug/m3
*This is the current enforceable standard		
EPA IRIS		
NOAEL for Developmental Effects	1,244,000	ug/m3

Calculated RfC [NOAEL/(UF x 100)]	12,440	ug/m3
Concentration at HI 3	37,320	ug/m3
OEHHA		
NOAEL for Developmental Effects	50,000	ug/m3
Calculated RfC [NOAEL/(UF x 10)]	5000	ug/m3
Concentration at HI 3	15,000	ug/m3

Applying an HI of 3 to the original, neurological endpoint based TRV produces an enforceable limit of 2,400 ug/m3, which is far lower than needed to be protective of the stated endpoints of developmental and reproductive toxicity at a HI of 3, which are potentially 37,320 ug/m3 as per US EPA IRIS or 15,000 ug/m3 as per OEHHA.

Applying a broad reduction of HI values from 5 to 3 for substances that are not regulated based on reproductive or developmental outcomes does not specifically address the intended goal of providing additional public health benefit in this area. In order to specifically address these outcomes, HI values should relate directly to the toxicological endpoint of interest. For each substance that does not have a TRV based on reproductive or developmental toxicity, one should be developed before adjusting the HI value. However, it should be noted that as demonstrated in the above example, for many substances, regulating to an HI of 3 for reproductive and developmental endpoints may actually be less stringent than regulating to an HI of 5 for the endpoint that occurs at the lowest dose.

## Conclusion

Again, thank you for the opportunity to provide comment to the Hazard Index rulemaking process as a member of the Rulemaking Advisory Committee. I can be contacted to answer any questions at 503-844-9540 after August 5, 2019.

Sincerely,



Director of Regulatory and Government Affairs  
Northwest Pulp & Paper Association

---

**From:** Paul Lewis  
**Sent:** Monday, July 29, 2019 4:39 PM  
**To:** JOHNSON Keith; MACMILLAN Susan  
**Cc:** Marni Kuyl; Tricia Mortell; Nadege DUBUISSON; Jae P DOUGLAS; John WASIUTYNSKI  
**Subject:** Cleaner Air Oregon RAC Comments

Dear Keith,

Comments from Multnomah and Washington Counties on the recent RAC are below.  
Thanks for your consideration

July 29th, 2019 **Delivered via electronic mail to:**

Oregon Department of Environmental Quality  
Attn: Keith Johnson, Cleaner Air Oregon Program Manager, 700 NE  
Multnomah Street, Suite #600 Portland, Oregon 97232

Re: Comments on July 2019 Cleaner Air Oregon Advisory Committee Meeting

Please accept the following comments on the July 10th, 2019 Cleaner Air Oregon (CAO) Rulemaking Advisory Committee meeting. This letter represents the collective opinion of the local public health agencies of Multnomah and Washington Counties on the topic of 'Non-Cancer Hazard Index' rulemaking, Section 7 of SB1541, for the Oregon Department of Environmental Quality(DEQ).

The passage of SB 1541 in 2018 required Oregon DEQ to revise portions of the original rules in section 340-245 to comply with section 7 of SB 1541 regarding setting the range of Hazard Index (HI) for certain air toxics. Below we argue that these dangerous air toxics deserve designation as severe and an HI of no more than 3. As a result, when presented by DEQ with the two options for adjusting hazard indices based Risk Action Levels (RAL), we **overwhelmingly support Option 1- to regulate all 184 chemicals with a non-cancer toxicity reference value at a RAL of a hazard index of 3.**

The implementation of option 1 is not only the most health protective option, but also is in direct alignment with DEQ's and, OHA's respective missions, as well as the clear and unambiguous directive from Governor Brown. DEQ's mission states that the agency is to take a lead role in restoring, maintaining and enhancing the quality of Oregon's air, land and water, while being guided by values of public service, health, safety and wellness. In establishing Cleaner Air Oregon, the Governor clearly stated:

“Clean air is fundamental to good health. I am very concerned that federal and state air quality programs do not consider public health in regulating certain classes of industrial air emissions. This must change. Oregonians expect the state to prioritize the health and well-being of them and their families.”

We believe that a hazard index of no greater than 3 be used for any of the regulated air toxics that does not have a temporary and reversible physiological effect and can thus be regarded as having a severe impact on human health. In addition, we also want to address some of the statements that keeping the limits for all of these toxics at a hazard index of 5.

**Legislative Intent of SB1541 does not favor a higher HI.**

The legislative intent of SB 1541 has been questioned as an argument in favor of the higher hazard index for all toxic contaminants. There is little disagreement among those who testified and observed the process during the 2018 legislative session that the final bill was a compromise that assured the launch of the cleaner air program with the concession of increasing the hazard index from 1 to the final range of 3 to 5. Consequently, it is not possible to infer the 'legislative intent' from this history. However, if the legislature had wanted to set the limit at 5 for all chemicals they would have. Instead, they made an exception for developmental/reproductive impacts and other 'severe' impacts. By including the term 'severe' the legislature gave the agency license to include a broad class of toxic contaminants. The agency presented compelling evidence to establish that the more comprehensive list of toxic contaminants in Option 1 have severe health impacts.

### **There is no evidence that job loss would result from HIs of 3.**

Some committee members suggested that the change from a hazard index of 5 to 3 would create job loss. At the time of the Rules Advisory Committee(RAC) meeting, no committee member was able to give a specific example to support this. A study of the South Coast Air District in California published in 1997 specifically refuted this inaccurate fear mongering and documented not job losses, but job gains after the implementation of regulation<sup>3</sup>. Since then, numerous studies have demonstrated the cost savings of environmental regulations<sup>4</sup>. Without evidence or plausible examples, this generalization must be rejected as an argument in favor of accepting additional risk in exchange for jobs.

### **The Technical Advisory Committee process met the criteria of SB1541**

The Technical Advisory Committee(TAC) process and the RAC process met the statutory requirements of SB1541. Language in SB 1541 Section 7 - SB 1541 (B)(b) specifically states "the commission shall establish and consider the recommendations of an advisory committee composed, at a minimum of persons with technical expertise in toxic air contaminant risk assessment." The TAC was comprised of experts with educational background in toxicology, epidemiology, and risk assessment and provided relevant technical information. Had the proceedings concluded with only input from the TAC then the agency would have met the statutory requirement. Adding the RAC process goes above and beyond the statutory requirement. Having no compelling scientific or administrative reason to exclude the 43 orphaned-toxic chemicals from the list, the agency should accept the recommendation of its Technical Advisory Committee and adopt Option 1.

---

<sup>3</sup> Berman, E and Bui, L *Clearing the Air: The Impact of Air Quality Regulation on Jobs* Economic Policy Institute, 1997, Washington D.C

<sup>4</sup> U.S. EPA, *The Benefits and Costs of the Clean Air Act from 1990 to 2020: Final Report*, Office of Air and Radiation, March 2011; U.S. EPA, *The Benefits and Costs of the CAA 1990 to 2010: EPA Report to Congress*, Office of Air and Radiation, November 1999; U.S. EPA, *The Benefits and Costs of the CAA, 1970 to 1990: Prepared for U.S. Congress by U.S. Environmental Protection Agency*, October 1997.

### **All human health effects can be considered severe.**

SB 1541 did not define the term "severe" in reference to exceptions that can be established for reducing the HI from 5 to 3. The non-cancer health impacts from chemicals listed in the "target organ spreadsheet" have an effect on one or more target organs/systems. These include, but may not be limited to, kidney, liver, endocrine system, musculoskeletal system, central nervous system, cardiovascular system, immune system, respiratory system, reproductive system, and developmental effects. Depending on the type, magnitude and duration of the exposure, all of these systems can be severely impacted and cause temporary or permanent harm, injury or disability. An important consideration when establishing guidance that permits levels of environmental exposure that could cause harm is the potential impact of uncertainty that can create mental stress for community members. One can imagine the stress a parent might experience knowing that their child has been exposed to a chemical that targets and is known to cause damage to a child's organ or neurological system; a parent under these circumstances could be reasonably be expected to label the exposure and the impact of that exposure severe.

Severity can also depend on the recipient of the dose. For example, as OHA presented, some people have no reaction to a bee sting, while for others a bee sting is life-threatening due to anaphylaxis. There is too much variation in a human population to state that the chemicals identified by DEQ in the target organ spreadsheet can cause no severe reaction for any individual. As a majority of the technical advisory committee stated,

“There is no available science-based process to determine which chemicals are and are not expected to have other severe human health effects. All human health effects can be considered severe.”<sup>5</sup> We count on DEQ to protect the health of the community, including the most vulnerable. The 43 toxic air contaminants (out of 184) that do not meet HI TAC criteria for having developmental or reproductive health effects should also be designated as severe with a HI of no more than 3, according to the evidence presented by OHA and DEQ.

One illustrative example from the list of 43 orphaned-toxic air contaminants that are not expected to have developmental or reproductive health effects, yet should be considered having severe impact, is Phosgene. This infamous chemical was used as a ‘choking agent’ weapon in World War I and was responsible for the majority of chemical warfare deaths during that conflict<sup>6</sup>. While it is hard to imagine allowing a hazard index of even 3 for such a potent toxin; it is impossible to justify a hazard index of 5.

---

<sup>5</sup><https://emergency.cdc.gov/agent/phosgene/basics/facts.asp> accessed 7/22/2019

### **Option 1 is the most health protective**

If a HI is below one, then the potential health effects are assumed to be so low as to probably not be a concern. As a HI value increases beyond 1, there is increasingly greater concern that adverse health effects will occur. From the public health standpoint, an industrial site emitting air pollutants with a known Hazard Index greater than 1 and without available optimal pollution controls is concerning; operating at a level over 3 when better pollution control might be available is disturbing; allowing a default HI of 5 is not defensible in light of the science and the missions of both DEQ and OHA. The original rules as proposed by the agency set an HI of 1 based on sound science and the agencies’ mandate to protect the public’s health. Since setting the HI at a science based protective level of 1 is not permitted by the state legislature, the agency must scrutinize all toxic air contaminants for the potential to cause damage to human organ systems and designate those contaminants as having severe impacts and set the HI at a level no greater than 3.

Thank you for the opportunity to submit comments. We greatly value the ability to participate in the Rulemaking Advisory Committee and will continue to support DEQ and OHA in achieving fair, robust and health protective rules for industrial air permitting in Oregon.

Sincerely,

Paul Lewis, MD, MPH  
Tri-County Health Officer, Cleaner Air Oregon Advisory  
Committee Member

Jae P. Douglas, PhD, MSW  
Multnomah County Environmental Health Director Cleaner  
Air Oregon Advisory Committee Alternate

July 29, 2019

VIA EMAIL

Oregon Department of Environmental Quality  
Attention: Cleaner Air Oregon  
700 NE Multnomah Street, Suite 600  
Portland, OR 97232  
[cleanerair@deq.state.or.us](mailto:cleanerair@deq.state.or.us)

**Re: Comments in Response to the Cleaner Air Oregon Hazard Index Rulemaking  
Advisory Committee Meeting July 10, 2019**

Dear DEQ:

Thank you for the opportunity to comment on DEQ's Cleaner Air Oregon Hazard Index proposal presented at the July 10, 2019, Hazard Index Rulemaking Advisory Committee meeting (RAC). Oregon Business & Industry (OBI) is Oregon's most comprehensive business association representing approximately 1,600 businesses that employ nearly 330,000 people. We represent multiple business sectors including industrial and manufacturing companies that will be significantly impacted by these regulations.

OBI and its predecessor organizations have long been involved in the development of Cleaner Air Oregon and we support its goals of improving air quality, reducing air toxics, and protecting human health while also providing a workable regulatory environment that does not adversely affect Oregon's economy. We appreciate the considerable work DEQ has undertaken in standing up this extensive new air program. We offer the following comments in response to the two Hazard Index (HI) alternatives proposed by DEQ at the July 10 RAC meeting.

DEQ should access the regulatory flexibility provided by statute by implementing a two-step process in which specific chemicals are identified for possible HI adjustment and followed by adoption of rules to evaluate those contaminants according to scientific principles on a source-specific basis. This is not the current DEQ approach, which is more akin to a coarse screening methodology than a scientific evaluation based on contaminant and source-specific standards and criteria. This deviates significantly from the process provided in SB 1541. While we appreciate the ease of presenting a binary choice, we are concerned that neither option, changing the HI for all 184 chemicals from 5 to 3 or reducing the HI for 141 chemicals from 5 to 3, is consistent with the intent or language of SB 1541.

The statute's directive is to employ both a contaminant-specific and source-specific approach. The statute also directs DEQ to adjust a HI only for contaminants that are "expected to have" a severe human health effect. The way DEQ is interpreting and applying this "expected to have" language seems inconsistent, both with DEQ's various deployments of it and with a plain reading of SB 1541. That this language was included specifically in statute makes clear the expectation that DEQ would view it and implement it as a serious and specific consideration. In contrast, the proposed "coarse screening" approach does not seem to give appropriate weight to the statute's language that is merited.

We believe it is in the best long-term interest of DEQ and the CAO program for DEQ to return to the language of the statute, take a hard look at the process you have used so far, and develop scientific standards and criteria for evaluating each of the contaminants before initiating adjustments to the HIs. With respect to DEQ's request for input on the binary choice presented between adjusting all HIs to a 3 or reducing most HIs to a 3, we would prefer the latter option.

Regardless of the scope of DEQ's authority, the agency has an obligation to support and explain its actions. It has come to our attention that discussions of the Technical Advisory Committee (TAC) were limited to DEQ-chosen "authoritative sources" that did not include the most current science. In the words of one TAC member, "it is simply not accepted science practice to exclude valid data from consideration. Particularly when the 'authoritative sources' themselves are not primary scientific resources, but secondary reviews themselves." It is perplexing why DEQ would limit scientifically credible data from being considered in a technical process. Good policy is informed by good science and history is rife with examples of bad policy outcomes where good data and information were excluded or ignored. Both in the context of this rulemaking and as a broader DEQ position, it is inconsistent with the agency's mission that scientifically credible information and valid data be excluded from policy and decision making.

At its root, our concern is about DEQ's process and method of determining what constitutes risk to human health and whether this approach is consistent with current law and scientifically defensible. OBI member facilities will make major investments in technology to comply with Cleaner Air Oregon, which will result in major business impacts to remain economically viable. These facilities provide vital contributions to local communities and to Oregon overall. To require them to comply with regulations that go beyond the spirit and letter of the law is a disservice to our state and its citizens.

OBI members are deeply invested in seeing Cleaner Air Oregon and non-cancer risks associated with their operations implemented in a way that protects human health and the environment. Their facilities are based in Oregon, their employees and employees' families live here, they breathe the same air and recreate in places all Oregonians want to be able enjoy safely.

Thank you, again, for the opportunity to comment on the Hazard Index regulations. We urge DEQ to address these concerning issues in the next iteration of the Cleaner Air Oregon regulations.

Sincerely,

Sharla Moffett  
Director  
Energy, Environment, Natural Resources & Infrastructure

**TO:** Susan J. MacMillan  
Air Toxics Science and Policy Analyst  
Oregon Department of Environmental Quality  
[macmillan.susan@deg.state.or.us](mailto:macmillan.susan@deg.state.or.us)

**FR:** Steven A. Anderson, Advisory Committee Member

**RE:** Comments per July 10, 2019, Advisory Committee Meeting Non-Cancer Hazard Index Rulemaking

First, I want to say thank you to staff for all the hard work to-date. Our meeting on July 10<sup>th</sup> was very informative, presentations were instructive and helpful, and generally our discussions (and clarifications by staff) have provided a clearer focus on how to move forward towards a positive outcome to ensure clean, healthful air in Oregon.

My comments go to the issue raised at our meeting as to air contaminants to be regulated at a Hazard Index (HI) of 3 and those at a HI of 5. Background provided at our meeting included that:

- 184 air contaminants with non-cancer toxicity reference values (TRVs)
- 141 air contaminants of the 184 meet the criteria of the HI Technical Advisory Committee's (HI TAC) criteria for having developmental or reproductive health effects
- 43 air contaminants were not found to have developmental or reproductive health effects
- The HI TAC found, and therefore recommended, that developmental health effect to be classified as an "other severe human health effects" per SB 1541 and be included with reproductive health effects affecting a HI of 3 for these air contaminants
- HI TAC majority opinion was that the "other severe human health effects" in SB 1541 is not a scientifically definable term
- TRVs used to establish standards and criteria to be updated every three years

Therefore, whether these 43 air contaminants (not having developmental or reproductive health effects) are regulated at a HI of 3 or a HI of 5 is primarily a policy decision.

**RECOMMENDATION:** I am recommending that of the 43 air contaminants having respiratory health effects these air contaminants be regulated at a HI of 3; therefore, respiratory human health effects to be considered as a severe human health effect for these air contaminants.

My logic runs this way:

- Air contaminants like Phosgene, Sulfuric acid, Hydrochloric acid, and Hydrogen sulfide (just to mention a few) cause irreversible damage to the lungs
- Lead was one of the original criteria pollutants of the Clean Air Act and it is not regulated here at a health protective HI of 3 for it and its' associated compound air contaminants
- There is policy, as well as science-based health reasons, within the original Clean Air Act to consider respiratory human health effects as rationale for including it as severe per SB 1541
- The risk action levels for respiratory human health effects air contaminants with a HI of 5 are too high to ensure healthful air and health protection. There will be irreversible lung damage at these action levels.

There is strong policy history as well as human health effects data to regulate those 43 air contaminants having respiratory health effects at a HI of 3. The Clean Air Act set the policy direction in 1970 to regulate air contaminants ensuring a healthier airshed and reduction in adverse human health effects. Respiratory protection was a key part of this effort and continues to be today. Respiratory human health effects are severe. Damage to the lungs is irreversible. Damaged air sacks do not recover. Once damaged they remain so throughout one's lifetime reducing oxygen to blood transfer, putting more strain on the heart, and leading to other disease like lung cancer or COPD (Chronic Obstructive Pulmonary Disease).

There were other human health effects discussed at the meeting for inclusion as severe. It was pointed out that the HI TAC looked at 12 systems. So, at this point in time, recognizing that the TRVs will be reviewed again in three years hopefully providing better health effects data (including interactions with other chemicals, multiple effect's health endpoints, bioaccumulation, etc.), I believe that given the uncertain definition for "severe" right now that my suggested inclusion of respiratory human health effects has merit and I have demonstrated that it meets the severe definition, both in terms of policy and science. Therefore, include respiratory human health effects along with developmental and reproductive as severe human health effects causing air contaminants to be regulated at a HI of 3 for these air contaminants.

**IN CONCLUSION:**

- Rulemaking action under SB 1541 defined that reproductive human health effects and other severe human health effects be regulated at a HI of 3
- The HI TAC made the decision to include developmental human health effects as severe and a list of 141 air contaminants to be regulated at a HI of 3
- I am recommending that DEQ and the EQC, as part of their rulemaking here, add respiratory human health effects as a severe human health effect and regulate those air contaminants of the 43 in question at a HI of 3

There is strong policy and scientific-based human health effects data to support including respiratory human health effects considered as severe for the associated air contaminants exhibiting this human health effect. Furthermore, the higher risk action levels under SB 1541 if respiratory human health effects air contaminants were not included as severe would result in ambient air concentrations for these air contaminants clearly at levels where adverse health effects will occur, even for short-term exposure. This is well supported in the scientific, air quality, and toxicological literature.



July 29, 2019

**VIA EMAIL**

Oregon Department of Environmental Quality  
Attn: Susan J. MacMillan  
700 NE Multnomah Street, Suite #600  
Portland, OR 97232  
[macmillan.susan@deq.state.or.us](mailto:macmillan.susan@deq.state.or.us)

**Re: Comments in Response to the Cleaner Air Oregon Hazard Index Rulemaking  
Advisory Committee Meeting of July 10, 2019**

Dear Susan:

I am writing as the spokesperson for Oregonians for Fair Air Regulations, a coalition of business and manufacturing associations representing over 1,700 businesses in Oregon and approximately 250,000 employees, including nearly 75,000 manufacturing jobs. This coalition of Oregon businesses repeatedly submitted public comments during the Cleaner Air Oregon (“CAO”) Rulemaking Advisory Committee (“RAC”) process and remains dedicated to the development of a successful regulatory program for all Oregonians. Oregonians for Fair Air Regulations, however, is concerned with DEQ’s limited general approach and proposed options that are beyond the scope of the agreed upon statutory language approved by the Legislature in 2018. At the close of the Hazard Index (“HI”) Rulemaking Advisory Committee (“RAC”) meeting on July 10, 2019, the Department requested that RAC members submit comments on what was discussed. This letter is in response to that request.

Oregonians for Fair Air Regulations supports the goal of creating a predictable regulatory program capable of reducing air toxics and protecting public health without harming Oregon’s economy and overburdening our agencies. However, any such effort must be consistent with the statutory authority granted DEQ by the Legislature in SB 1541. DEQ lacks the discretion to do other than what was mandated by the Legislature. As outlined below, the two options that DEQ presented at the RAC meeting both contravene the Legislature’s clear intent. Instead, the RAC should have been provided one option, consistent with SB 1541, that requires a source-specific approach and includes only the chemicals “that are expected to have: (a) Developmental human health effects associated with prenatal or postnatal exposure; or (b) Other severe human health effects, nothing more.

Please accept our comments below in the constructive spirit in which they are intended. Oregonians for Fair Air Regulations appreciates the work that DEQ and OHA have done to date and offers these comments with the hope of ensuring that we end up with a program that best serves Oregonians while remaining true to the Legislature's intent.

**SB 1541 Requires a Source-Specific Approach for HI Adjustment Based on Established Regulatory Standards and Criteria**

The sole purpose of the HI RAC was to consider rulemaking intended to implement Section 7 of SB 1541. That portion of the statute, reproduced verbatim below, outlines a specific process and sets substantive requirements for the benchmark adjustment rulemaking.

SECTION 7. (1) Notwithstanding section 2 (2)(b) of this 2018 Act, the Department of Environmental Quality may regulate an existing air contamination source pursuant to section 3 or 4 of this 2018 Act based on a benchmark for excess noncancer risk that is adjusted to equal a Hazard Index number other than 5, if the department determines that the existing air contamination source emits a material amount of one or more toxic air contaminants that are identified by the Environmental Quality Commission by rule to be toxic air contaminants that are expected to have:

(a) Developmental human health effects associated with prenatal or postnatal exposure; or

(b) Other severe human health effects.

(2) The adjusted benchmark for excess noncancer risk applicable to an air contamination source described in subsection (1) of this section may be equal to a Hazard Index number determined by the department based on standards and criteria set forth by the commission in rule, but may be no less than a Hazard Index number of 3.

(3)(a) The commission shall adopt rules necessary to implement this section. The rules must, at a minimum:

(A) Identify toxic air contaminants for which the department may apply an adjusted benchmark for excess noncancer risk under subsection (1) of this section; and

(B) Establish standards and criteria for determining the degree to which the department may adjust the benchmark for excess

noncancer risk applicable to an individual air contamination source described in subsection (1) of this section.

(b) Before adopting rules under this section, the commission shall establish and consider the recommendations of an advisory committee composed, at a minimum, of persons with technical expertise in toxic air contaminant risk assessment.

The statute very specifically prescribes the envisioned process for and requirements governing the benchmark adjustment rulemaking. Section (3)(a) requires the Environmental Quality Commission (“EQC”) to develop rules that achieve two separate but related objectives. First, subpart (A) of Section (3)(a) directs the EQC to identify specific toxics for which DEQ may apply an adjusted benchmark.<sup>1</sup> So the first step of any rulemaking undertaken by DEQ to implement SB 1541 must be to derive a list of those toxics for which, under appropriate circumstances, DEQ may adjust the benchmark. Second, subpart (B) of Section (3)(a) of the statute directs the EQC to adopt rules which “establish standards and criteria” for DEQ to apply when “determining the degree to which” to customize the benchmark applicable to “an individual air contamination source.” So the second step is for the EQC to adopt rules governing how DEQ may determine, on a source specific basis, whether to reduce the benchmark from 5 to 3.

SB 1541 thus unambiguously establishes the following ground rules, to which both the EQC and DEQ are bound, for the benchmark adjustment rulemaking:

- SB 1541 does not authorize the EQC to adopt rules that automatically reduce the benchmark for all sources.
- SB 1541 directs the EQC to adopt rules by which DEQ may, pursuant to defined standards and criteria, adjust the benchmark applicable to a specific source.

DEQ’s presentation at the July 10, 2019 RAC meeting revealed that DEQ is poised to propose a set of HI adjustment rules that directly contravene SB 1541. The options that DEQ presented to the RAC would, instead of applying a discretionary source-specific process, apply a “one size fits all” determination to automatically reduce the HI for all Oregon sources subject to CAO, without exception and without reference to source-specific standards and criteria. DEQ’s proposed approaches are not at all what the Legislature contemplated when it enacted SB 1541. The Legislature’s repeated use of the word “shall” in Section 7 of SB 1541 to describe the

---

<sup>1</sup> SB 1541 employs the term benchmark. In adopting the Cleaner Air Oregon rules subsequent to the adoption of SB 1541, DEQ used the term Risk Action Level or “RAL.” In this letter we employ the statutory term, benchmark.

rulemaking process and scope underscores that the Legislature specifically decided not to bestow authority upon DEQ or the EQC to unilaterally change the benchmark for all sources. Any proposal for a wholesale change of all noncancer benchmarks for all sources is thus plainly inconsistent with the statute. We are concerned that the regulatory options presented by DEQ at the RAC meeting ignore the unambiguous Legislative precepts for the benchmark adjustment rulemaking in favor of an unauthorized move to shift most or all toxics from a benchmark of 5 to a benchmark of 3, and to make the revised benchmark automatically applicable to all sources without reference to any established standards or criteria. Such an approach is well beyond the authority provided to DEQ and the EQC under the statute.

### **SB 1541 Requires a Source-Specific Analysis of Emissions**

We are equally concerned that the concepts presented by DEQ at the RAC meeting are inconsistent with the clear Legislative intent that DEQ perform a chemical-specific analysis. Section 7(1) of SB 1541 authorizes the EQC to adopt rules authorizing the decrease of the benchmark from 5 to 3 for a toxic emitted by an individual existing source if: (a) the Department determines that the source emits a material amount of a toxic, and (b) that toxic has been identified by the EQC by rule to be expected to have either developmental human health impacts associated with prenatal or postnatal exposure or other severe human health impacts. The allocation of these responsibilities is telling. It is DEQ in its regulation of an existing source that must determine whether that source emits a material amount of a particular toxic or toxics that have been identified by the EQC as being expected to have a developmental or other severe health effect and, if so, whether to adjust the benchmark for that source. This passage reinforces the structure established in Section 7(3)(a) by which the EQC adopts a procedure (including specific standards and criteria) for considering on a site-specific basis whether to reduce the benchmark from 5, but DEQ must assess a source to determine whether it is appropriate to implement that procedure on a site-specific basis. Neither of the regulatory options introduced by DEQ at the RAC meeting followed this procedure notwithstanding it being clearly laid out in the statute.

### **SB 1541 Requires a Chemical-Specific Analysis**

SB 1541 does not direct or even authorize the EQC to adopt rules that reduce the benchmark for excess noncancer risk from 5 to 3 for all chemicals. Instead, the statute mandates that DEQ may, for a specific source, adjust the benchmark for only those toxics that the EQC determines have emissions which are “expected to have” a deleterious effect. Moreover, SB 1541 states such deleterious effect must be either a developmental human health effect or another severe human health effect. In order to determine that any specific toxic would be “expected to have” a developmental or other severe effect, it is necessary for DEQ to assess which chemicals, when emitted from a particular source, would be expected to have such an impact in the absence of reducing the benchmark from 5 to 3. Where a chemical already has a Risk Based Concentration (“RBC”) that reflects highly protective assumptions, then that chemical cannot be “expected to

have” the severe effects that merit a reduction of the benchmark.<sup>2</sup> Similarly, at the RAC meeting, DEQ and OHA stated that they were contemplating an option of changing the benchmark from 5 to 3 for all 141 chemicals that have any indication of developmental or reproductive effects, regardless of whether such effects were the primary risk driver for those chemicals or whether those chemicals are credibly expected to present a risk of those impacts at a benchmark of 5. Such an approach is clearly inconsistent with the statute.

### **SB 1541 Does Not Authorize Reducing Benchmark Unless RBC is Based on Developmental Impacts**

During the RAC meeting DEQ and OHA explained that it was proposing to reduce the benchmark from 5 to 3 based on developmental health effects even if the Toxicity Reference Value (“TRV”) was not based on developmental health effects. Such an approach would greatly distort the intent of SB 1541. Based on this approach, a chemical such as acetaldehyde, for which the noncancer TRV is based on respiratory effects and which has an uncertainty factor of 300 applied to it (both chronic and acute) would be considered a developmental toxic and the benchmark would be reduced from 5 to 3 under either proposal floated at the RAC. However, because the non-cancer TRV and RBC were set based on impacts to respiratory effects, the result of DEQ’s rule would be to artificially lower the benchmark without regard to the statutory criteria. Under the words of the statute, a benchmark should only be reduced if the target organ/system that resulted in the establishment of the TRV/RBC was developmental impacts. Under that clear reading of the statute, acetaldehyde would not have its benchmark reduced from 5 to 3 as the TRV was not based on developmental impacts. DEQ’s proposed approach would inappropriately divorce the benchmark from the TRV derivation process.

### **SB 1541 Does Not Extend to Reproductive Effects**

In the RAC meeting, DEQ appeared to assume that the reference to developmental impacts in Section 7(1)(a) included reproductive effects. However, as one of the members of the Technical Advisory Committee (“TAC”) noted in her comments to DEQ and OHA:

[T]here is a well-established toxicological difference between reproductive toxicity (i.e., effects on sexual function and fertility) developmental toxicity (*i.e.*, effects on the developing embryo or

---

<sup>2</sup> DEQ cannot reasonably propose that the EQC identify every chemical with an RBC as “expected to have” a severe effect without a benchmark adjustment. In its own response to public comments on the CAO rules, DEQ explained that DEQ and OHA wrote “the [CAO] rules with the goal of designing a program that protects the health of sensitive populations such as children, pregnant women, elderly people, and people with chronic health problems.” Concerning the RBC’s, DEQ emphasized that “the Risk Based Concentrations set for each chemical are based on values developed by authoritative sources using an approach that is intended to be protective of the most sensitive health endpoints in sensitive populations.”

fetus, or post-natal development), maternal toxicity, and so forth. These are terms of art known to any toxicologist that the Department is requesting we disregard.<sup>3</sup>

Clearly, there is no authority to read the statute to include words that are not there. DEQ cannot simply assume that when the Legislature chose certain words (“developmental human health effects”), the Legislature instead meant something much broader (developmental and reproductive human health effects). To do so would defy the established rules of statutory interpretation. In considering an approach to the current rulemaking, DEQ must distinguish between those chemicals that have developmental impacts and those that have reproductive impacts. Any adjustment to a benchmark based on Section 7(1)(a) must be limited to those chemicals for which the basis of the TRV is developmental health effects, not reproductive health effects. Any other approach violates the statute.

### **The Proposal Does Not Consider the Most Current Science**

In the RAC meeting DEQ indicated that 184 chemicals identified as toxics have TRVs for non-cancer effects and that 141 had some level of developmental or reproductive effect attributed to them. These impacts were summarized in a spreadsheet provided to the RAC. We appreciate the effort that went into creating that spreadsheet as it lays out the basis for the TRVs in a more readable format. However, it also makes clear that the TAC was limited to DEQ’s chosen “authoritative sources.” As multiple TAC members objected, this prevented them in their deliberations from considering the most current science and results in some inappropriate and scientifically unsound conclusions. SB 1541 does not authorize DEQ to ignore the best science. DEQ should not proceed with this rulemaking except where a change in the benchmark is justified by the best, most current science. The failure of the sources deemed “authoritative” to keep up with the current science should not prevent DEQ from adopting an approach that applies the best available science. As one of the TAC members commented, “the process has failed to produce a list of substances that, on a health basis, would require an HI of 3 as opposed to 5 as directed by SB 1541.” Therefore, the proposed options for benchmark adjustment should be revised to reflect the best information available to DEQ. Again, in the absence of the best scientific information indicating that a change in a benchmark is warranted in order to avoid a risk not already addressed through the uncertainty factors, a benchmark should not be changed.

### **The Exceedance Ratio Approach is Sound**

We want to note our support of the practical approach proposed by DEQ for determining weighting impacts for a facility that emits toxics that are subject to more than one benchmark.

---

<sup>3</sup> Comment letter submitted by Dr. Kathryn Kelly dated February 28, 2019.  
<https://www.oregon.gov/deq/Rulemaking%20Docs/caohitaccomments.pdf>.

We believe that if any benchmarks are reduced from 5 to a lower value, it is appropriate to have such an approach and appreciate DEQ including that aspect in its proposal.

### **Conclusions & Recommendations**

The businesses making up Oregonians for Fair Air Regulations are proud of their longstanding and cooperative work with DEQ to reduce air emissions. We encourage the Department to revise its proposal to reflect the comments above. Specifically, we request that DEQ adhere to the process envisioned by the Legislature and memorialized in SB 1541. This requires that the EQC develop a list of toxics for which DEQ may apply an adjusted benchmark. That list should reflect the best science and only include toxics where, at an HI of 5, the best science documents that there are expected to be developmental or other severe effects. Where uncertainty factors have already been incorporated into the TRV or other precautions have been incorporated into the RBC to avoid such risks at an HI of 5, the toxic should not be on the list as a benchmark reduction is not merited. Separate and distinct from developing that list, SB 1541 directs the EQC to adopt procedures to be used by DEQ to establish the individual sources at which, based on site-specific conditions, it is appropriate to apply that reduction to listed toxics emitted by those sources. Although this structure is mandated by SB 1541, it is very different from anything proposed by DEQ at the RAC. The proposal ultimately taken by DEQ to rulemaking must reflect the mandated statutory structure. Aside from the fact that it is legally required, adhering to the statute will result in a better program that better serves DEQ, the public and the regulated community.

We thank you for all of your work to date and your consideration of these comments. Please do not hesitate to call me if you have any questions about this letter.

Sincerely,



Thomas R. Wood

TRW/dlcr

cc: Richard Whitman  
Leah Feldon  
Keith Johnson  
Sharla Moffett  
Mike Freese  
Heath Curtiss  
Geoff Tichenor



July 26, 2019

**VIA EMAIL AT:** johnson.keith@deq.state.or.us

Oregon Department of Environmental Quality  
Attn: Keith Johnson, Cleaner Air Oregon Program  
Manager, 700 NE Multnomah Street, Suite #600  
Portland, Oregon 97232

**Re: Comments on Proposed Cleaner Air Oregon Hazard  
Index Rulemaking**

Dear Mr. Johnson:

Thank you for the opportunity to comment on the Cleaner Air Oregon rulemaking relating to the noncancer hazard index thresholds set for toxic air contaminants throughout Oregon. These comments are submitted on behalf of Neighbors for Clean Air, Northwest Environmental Defense Center, OPAL Environmental Justice Oregon and Beyond Toxics.

I. Every Toxic Air Contaminant on the List Merits an HI of 3

Our organizations firmly believe that the appropriate action would be to maintain a Hazard Index (“HI”) of 1 for all toxic air contaminants regulated within the Cleaner Air Oregon (“CAO”) program. However, in the wake of legislative action, we understand that Oregon Department of Environmental Quality (“ODEQ”) is limited to

considering which of the toxic air contaminants regulated under the program should be regulated for non-cancer risk at a Hazard Index (HI) lower than 5, but no less than 3. According to the technical experts in the fields of toxicology and epidemiology, an HI of 1 is typically considered the threshold for concern in regard to non-cancer effects. The policy choice to base this aspect of the program on a cost-benefit analysis should not undermine the stated overarching goal of CAO: to protect the public from exposure to toxic air contaminants emitted from industrial facilities.

SB1541 mandates that any toxic air contaminant with non-cancer developmental or other severe effects on human health be considered for an HI lowered to 3 rather than 5. The Hazard Index Technical Advisory Committee (HI TAC) members were very clear: discerning the point at which adverse effects become elevated to the point of “severe” is an impossible task. In fact, the term “severe” is meaningless in this context. This is the terminology they use throughout the discussion. Severity can depend on the recipient of the dose. For example, some people have no reaction to a bee sting, while for others a bee sting is life-threatening due to anaphylaxis. There is too much variation in a human population to state that a chemical can cause no severe reaction for any of them. It seems to us that perhaps a more useful term is “adverse,” a word used by many HI-TAC members in discussing the effects of the contaminants listed.

Another reason to maintain similar treatment for this list of contaminants is the risk posed by picking and choosing between chemicals in the same class: HI TAC members articulated concern that regulating one chemical out of a class will cause industrial sources to shift to use of another chemical in the same class that may have similar health effects, but for which less scientific data has been generated. This situation is rampant throughout our economy, with industry outpacing regulators with their slight shifts in chemicals to skirt enforcement. Furthermore, as an HI value is raised higher, the risk is increasingly greater that adverse health effects will occur. It would be very difficult to argue that certain adverse effects merit an HI of 5 or 4 given the exponential growth of the risk that occurs with each level the value is raised. For all these reasons, we believe all of the listed toxic air contaminants should be listed at 3.

## II. Legislative Intent Mandates ODEQ to Take the Recommendation of the Technical Advisory Committee

SB 1541 specifically states that the commission shall establish and consider the recommendations of an advisory committee composed, at a minimum, of persons with

technical expertise in toxic air contaminant risk assessment.<sup>1</sup> Thus we see that the legislative intent was that ODEQ is mandated to take the recommendation of the HI TAC, which was comprised of experts with educational background in toxicology, epidemiology, and risk assessment. This is why our comments lean so heavily on the recommendations of HI TAC members. The statute is silent on how ODEQ should consider the recommendations of the Rules Advisory Committee.

### III. Option 1 is the Only Path that Makes Sense

Between the options ODEQ has offered to the RAC for consideration, Option 1 is both the most health-protective and the easiest for agencies and industry alike to work with, making the choice between Options 1 and 2 an easy one. Maintaining an HI of 3 for the full list of 184 contaminants would require less administrative work for ODEQ, and preclude our concerns outlined above, such as industrial use of different chemicals in the same class to skirt regulations.

We ask the following questions of ODEQ to clarify how Option 2 could be preferable in a program that purports to protect the public from exposure to toxic air contaminants emitted from industrial facilities.

1. Is there any scenario under which option 2 is more health-protective?
2. Can it be said definitively that any of the air toxic contaminants not associated with prenatal or postnatal exposure have no possibility of causing severe human health effects?
3. Which option provides more certainty to industry and is more efficient for the agencies to implement?

We hope that ODEQ will lean heavily on the comments provided by the HI TAC in making their final determination, as required by SB 1541.

Sincerely,

Tori Cole  
Neighbors for Clean Air

Mark Riskedahl  
Northwest Environmental Defense Center

---

<sup>1</sup> § 7 (B)(b).

Huy Ong  
OPAL Environmental Justice Oregon

Lisa Arkin  
Beyond Toxics