State of Oregon Department of Environmental Quality

Oregon Environmental Quality Commission special meeting

April 24, 2020

Rulemaking, Action Item A

Cleaner Air Oregon Hazard Index

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DEQ Recommendation to EQC

DEQ recommends that the Environmental Quality Commission adopt the proposed rules and rule amendments in Attachment A as part of Chapter 340, Division 245 of the Oregon Administrative Rules.

Proposed EQC motion language:

"I move that the commission adopt the proposed rules and rule amendments as seen in Attachment A of this staff report as part of Chapter 340, Division 245 of the Oregon Administrative Rules."

Introduction

DEQ proposes the following changes to OAR 340, division 245 that would:

- Adjust the benchmark, or Risk Action Level, at which existing facilities regulated under the Cleaner Air Oregon program must take action to reduce noncancer risk from 158 noncancer toxic air contaminants. This action would lower noncancer Risk Action Level benchmarks for 158 toxic air contaminants from a Hazard Index of 5 to a Hazard Index of 3.
- Provide a calculation for existing facilities to estimate site-specific risk if they emit a mix of noncancer toxic air contaminants that are regulated at both a Risk Action Level of a Hazard Index of 3 and a Hazard Index of 5.

Request for other options

During the public comment period, DEQ asked for public comment on whether there are other options for achieving the rules' substantive goals while reducing the rules' potential negative economic impact on business.

Overview

DEQ proposes these Hazard Index rules, which amend existing program rules that established the Cleaner Air Oregon program, a state health risk-based air toxics regulatory program that adds requirements to DEQ's air quality permitting. In April 2018, the Oregon legislature enacted Senate Bill 1541, which authorized and funded the CAO program and set parameters and requirements for future program rules.

SB 1541 established benchmarks, or Risk Action Levels, at which existing permitted facilities must take action to reduce emissions or demonstrate best available controls are in place. SB 1541 also establishes a process for the Environmental Quality Commission to identify certain chemicals expected to have developmental or other severe human health effects. For these chemicals, SB 1541 allows DEQ to set benchmarks at existing facilities for Risk Action Levels (RALs) lower than a Hazard Index (HI) of 5, but no lower than 3. The commission must also establish standards and criteria for the degree of these adjustments.

In addition, SB 1541 also requires that the Environmental Quality Commission convene and consider recommendations from a technical advisory committee before adjusting HI benchmarks for certain chemicals expected to have developmental or other severe human health effects. DEQ convened a Technical Advisory Committee, a Rules Advisory Committee, and a Fiscal Advisory Committee for this rulemaking and considered their science- and policy-based recommendations.

The committees considered toxic air contaminants (identified in the existing CAO program rules) with noncancer effects and how to adjust RALs, or benchmarks, that would apply to emissions from existing facilities. The proposed HI rules lower benchmarks for 158 toxic air contaminants from a RAL of an HI of 5 to an HI of 3. The proposed rules also provide a formula for calculating a Risk Determination Ratio for facilities which emit a mix of toxic air contaminants regulated at a Risk Action Level of HI 3 as well as HI 5. This proposed rulemaking does not change the methods by which the CAO program addresses cancer risk. Facility CAO risk assessments must consider cancer and noncancer risks separately.

Background

Hazard Indices, Toxicity Reference Values, and Risk Action Levels

Noncancer health risk from multiple air contaminants is measured using a Hazard Index, or HI. A HI number is calculated by comparing the amount of each chemical present in the air with the amount of each chemical that is not expected to harm health. An HI at or below 1 means a person breathing a facility's emissions is not expected to experience health effects. An HI greater than 1 means a person breathing a facility's emissions is more likely to experience health effects.

Amounts of chemicals that are not expected to harm health are calculated values known as Toxicity Reference Values, or TRVs. In the context of noncancer risk, TRVs represent concentrations of chemicals that are equivalent to a Hazard Quotient of 1 based on an individual chemical. The sum of Hazard Quotients for multiple individual chemicals is the HI representing total noncancer risk from all chemicals emitted by a facility.

TRVs for both cancer and noncancer effects are available from the regulatory toxicity literature for approximately 259 of the approximately 600 toxic air contaminants regulated under CAO. DEQ obtained TRVs from a specific set of authoritative sources identified in CAO rules. These authoritative sources include:

- Ambient Benchmark Concentrations adopted by Oregon DEQ in 2018 based on recommendations made by DEQ's Air Toxics Science Advisory Committee
- U.S. Environmental Protection Agency's (EPA) Integrated Risk Information System
- U.S. EPA's Provisional Peer-Reviewed Toxicity Values
- Agency for Toxic Substances and Disease Registry
- California's Office of Environmental Health Hazard Assessment

CAO rules list TRVs based on noncancer effects for 182 toxic air contaminants (OAR 340-245-8030, Table 3).

Risk Action Levels, or RALs, are those levels of risk (not concentrations) above which facilities must take some action related to their air toxics emissions. Each benchmark established in SB 1541 serves as a RAL with a specific HI value. If the noncancer risk related to a facility's emissions exceeds the relevant HI benchmark, then the facility would have to take some action to decrease those emissions and reduce risk.

Hazard Index Technical Advisory Committee

SB 1541 directs the EQC to convene a Hazard Index Technical Advisory Committee of health and toxicological experts to address and provide recommendations regarding technical aspects of the HI rulemaking. DEQ and Oregon Health Authority staff worked together to recruit seven expert volunteers. DEQ and OHA identified and recommended to the EQC five of the committee members who had relevant technical skill sets and recommended an additional two at-large members based on specific criteria from a group of external experts who applied online.

On July 12, 2018, the Environmental Quality Commission appointed the following seven candidates to serve on the Technical Advisory Committee for the CAO Hazard Index rulemaking effort:

- Dr. Amy Padula, University of California at San Francisco
- Dr. John Vandenberg, National Center for Environmental Assessment, U.S. Environmental Protection Agency
- Dr. John Budroe, California Office of Environmental Health Hazard Assessment
- Dr. Steven Gilbert, Institute of Neurotoxicology and Neurological Disorders, and University of Washington
- Dr. Perry Hystad, Oregon State University
- Dr. Kathryn Kelly, Delta Toxicology (at-large)
- Dr. Neeraja Erraguntla, American Chemistry Council (at-large)

For the members' qualifications and skill sets, please go to the Hazard Index Technical Advisory Committee web page, located here:
https://www.oregon.gov/deq/Regulations/rulemaking/Pages/acaohi2019.aspx

The committee met Oct. 23, 2018, and Dec. 4, 2018. Prior to and during these meetings, DEQ and OHA staff provided the committee members with technical and administrative information regarding a list of chemicals regulated under the CAO program rules that are expected to have noncancer effects. Agencies asked the committee to review the information and provide input to assist agencies in determining which chemicals had developmental and/or other severe health effects and should be assigned a benchmark of an HI lower than 5, but not lower than 3. DEQ and OHA staff were available during and outside meetings to address committee questions and concerns. Agency staff did not direct the committee member decision-making or recommendations, except to explain that the agencies would not be able to consider recommendations that were inconsistent with statute or resources allocated by the Oregon legislature to implement Cleaner Air Oregon. Both meetings were open to the public, and were managed by a third-party facilitator.

DEQ and OHA staff also provided the committee with an initial list of the target organs affected by each chemical, which staff compiled in a Target Organ Spreadsheet. DEQ obtained toxicological information for the spreadsheet from the list of authoritative sources identified in OAR 340-245-0300(1)(a) through (e). DEQ and OHA drafted a set of inclusion criteria for determining which types of toxicological information could consistently be judged as credible, accurate, and complete. DEQ and OHA then shared these inclusion criteria with the members for the committee's input. Agency staff incorporated the resulting recommendations into the final inclusion criteria, which agency staff then used to conduct quality assurance peer-review of the data contained in the Target Organ Spreadsheet.

A majority of committee members recommended or agreed that:

- Developmental and reproductive effects be assessed as a single effect because they are very closely related, rather than separately.

- Hazard identification, rather than dose response, is the appropriate metric to use for classifying a chemical as a developmental toxic air contaminant. Toxic air contaminants should be deemed to have developmental effects even if developmental effects are not the most sensitive impact. For example, a toxic air contaminant may have a TRV that is based on kidney damage, but at a higher concentration developmental effects also occur.
- Determining which health effects, outside of those that cause developmental and reproductive effects, can be considered "severe" is too difficult a task without knowing the legislative establishment of other criteria associated with the word "severe", since the scientific literature classifies health effects by the organ or system affected (e.g., neurological, developmental, respiratory). Defining "severe" is largely a policy decision, not a scientific one. The majority of the committee agreed that whether an effect is severe or not is dependent on the individual person; some individuals might suffer permanent damage or death from exposure to a chemical that might only cause minor health effects to other individuals. 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.

Other opinions and input were expressed by individual members. Documentation of this information in committee meeting minutes and in member comment letters received after those meetings can be found here.

Hazard Index Rules Advisory Committee and Fiscal Advisory Committee

DEQ convened the Hazard Index Rules Advisory Committee, which included 19 of the previous 2016-2018 CAO rules advisory committee members or their current replacements. The RAC met on July 10, 2019, to review and discuss two options presented by DEQ. These options were presented as illustrative examples of what HI rules could look like for the committee to discuss, not as explicit rule options themselves:

1) Option 1: Adjust the benchmark of all 182 toxic air contaminants that have noncancer toxicity reference values to an HI of 3. All of these chemicals have an effect on one or more target organs/systems, which include kidney, liver, blood, endocrine system, musculoskeletal system, eyes, skin, central nervous system, peripheral nervous system, cardiovascular system, immune system, respiratory system, reproductive system, gastrointestinal system, and developmental effects. Since any human population will contain some members for which any of the above effects could have a severe health effect, all 182 toxic air contaminants could be considered to have developmental or other severe health effects.
2) Option 2: Adjust the benchmark of toxic air contaminants that have developmental and/or reproductive effects to an HI of 3. Leave the existing benchmarks of the remaining toxic air contaminants without developmental and/or reproductive effects unchanged at an HI of 5.

Several members expressed support for Option 1. None of the members fully supported Option 2. DEQ received many additional comments and suggestions from members.

DEQ invited all Rules Advisory Committee members to serve as members of the Fiscal Advisory Committee. The Fiscal Advisory Committee is required to consider the potential fiscal impacts of the proposed Hazard Index rules, whether there is a significant fiscal impact to small businesses, and if there is, provide suggestions on how that impact to small businesses might be mitigated.

On Sept. 13, 2019, DEQ shared draft rules, reflecting input from the Technical and Rules Advisory Committee, with Fiscal Advisory Committee. These draft rules also included proposed modifications identified by DEQ staff. The Fiscal Advisory Committee met Sept. 23, 2019, and, generally, did think the proposed HI rules would cause fiscal impacts, but were divided on the question of whether or on not small businesses would be significantly impacted. The committee also gave recommendations on possible mitigation strategies for small businesses. A more detailed account of the fiscal discussions are available in the FAC meeting summary, and also in the section entitled "Advisory committee fiscal review".

Conclusions applied to proposed HI rule revisions

After reviewing and considering all the input provided by all three Advisory Committees, DEQ is proposing 158 noncancer air toxic contaminants to be regulated at a RAL of an HI of 3 for existing facilities. DEQ's proposal considers four criteria for the 158 noncancer air toxic contaminants to be regulated at an HI of 3 (Table 1).

Table 1.

		Number of Toxic Air Contaminants
Developmental Health Effects		133
Other Severe Health Effects	Reproductive Health Effects	116
	Multiple Target Organs	63
	U.S. Department of Transportation Inhalation Hazards	14
Expected to have Developmental and/or Other Severe Health Effects		**158**

Note that the number of toxic air contaminants identified in each Table 1 category do not add up to 158. This is because 114 of these chemicals are found in more than one list; thus, there are multiple lines of evidence indicating that these chemicals are expected to have other severe human health effects, given these proposed categories. These categories are described in more detail below.

Toxic Air Contaminants with Developmental Effects

133 toxic air contaminants are expected to have developmental effects. Developmental health effects are adverse health outcomes in offspring which occur from chemical exposure during development, beginning with parental germ cells and continuing through all following stages of development. As a result of input from the HI Technical Advisory Committee members, if a chemical had a developmental health effect at any dose, then it was classified as a toxic air contaminant with developmental effects, even if the contaminant also caused other health effects at lower doses.

Toxic Air Contaminants with Other Severe Health Effects

Reproductive Health Effects - 116 toxic air contaminants are proposed to be regulated to a benchmark of an HI of 3 because they are expected to have reproductive effects. Reproductive human health effects are closely related to developmental health effects. DEQ is proposing that reproductive effects be classified as other severe human health effects.

Multiple Target Organs – 63 toxic air contaminants are proposed to be regulated to a benchmark of an HI of 3 because the chemical's TRV is based on effects on more than one target organ or organ system.

U.S. Department of Transportation Inhalation Hazards - In response to a concern voiced during the Rules Advisory Committee, DEQ and OHA considered information from the U.S. Department of Transportation, which lists chemicals that are inhalation hazards under Hazard Classes 2.3 and 6.1. These chemicals are "known to be so toxic to humans as to pose a hazard to health during transportation" (49 CFR 173.115). Phosgene is one such chemical that poses an inhalation hazard according to the U.S. DOT. These chemicals pose inhalation hazards during transportation via volatilization, aerosolization, or particulate dispersion.

There are 14 chemicals that are classified by the U.S. DOT as inhalation hazards and that DEQ and OHA listed in the CAO program rules (OAR 340-245-8030) as having noncancer health effects. Several of these overlap with the list of 158 toxic air contaminants with developmental human health effects, reproductive effects, and/or those that affect multiple target organ systems. DEQ is proposing that inclusion of a chemical on the list of "inhalation hazards" be a parameter indicative of a severe human health impact. This means that three toxic air contaminants from the DOT list that are not already listed under other criteria be added to the list of chemicals that DEQ may regulate at an HI of 3. These chemicals are phosgene, chloropicrin, and oleum.

Risk Determination Ratio

The proposed Risk Determination Ratio formula (Equation 1) weights the noncancer risk from a mixture of toxic air contaminants being emitted from an individual air contamination source that

is regulated based on two different benchmarks for excess noncancer risk (i.e. benchmarks of both HI 3 and HI 5). This would allow mixtures of toxic air contaminants that are regulated at two different Risk Action Levels to be equivalently considered in order to calculate a unique risk value for the emissions from that particular source. The Risk Determination Ratio addresses in part requirements of Senate Bill 1541 that direct the commission to establish standards and criteria for determining the degree to which the department can adjust a noncancer benchmark for existing facilities.

Equation 1. Calculating a Risk Determination Ratio.

$$Risk_{HI3} = \sum_{HI3\ chemicals} \frac{Concentration}{Risk\ Based\ Concentration}$$

$$Risk_{HI5} = \sum_{HI5\ chemicals} \frac{Concentration}{Risk\ Based\ Concentration}$$

$$Risk\ Determination\ Ratio = \frac{Risk_{HI3}}{3} + \frac{Risk_{HI5}}{5}$$

HI3 = Toxic air contaminants assigned noncancer TBACT RAL of 3 (OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4 draft).
HI5 = Toxic air contaminants assigned noncancer TBACT RAL of 5 (OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4 draft).
RBC = Risk-based concentration (OAR 340-245-8040, Table 4 draft).

Statement of Need

Proposed Rule or Topic	Discussion
What need would the proposed rule address?	The proposed rule addresses provisions of SB 1541 that allow DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. The proposed rules base the RALs, or benchmarks, for existing sources emitting these chemicals on a noncancer HI value of 3, if the chemical is expected to cause developmental or other severe human health effects.
How would the proposed rule address the need?	The proposed rules establish more protective standards for these chemicals based upon a review of available scientific evidence from authoritative sources. The rules will apply to existing facilities that emit toxic air contaminants that have noncancer effects. Facilities would calculate their emissions and the potential noncancer health risk the emissions pose to nearby people. If the noncancer risk is above RALs set in the rules, the facility would need to reduce the risk or take other actions.
How will DEQ know the rule addressed the need?	CAO program health risk assessments will give DEQ and OHA a detailed understanding of the potential health impacts of toxic air contaminants from existing facilities, including those causing noncancer human health effects. Promulgating these rules, as directed by SB 1541, enables action when exposure to chemicals that are known to cause developmental or other severe health impacts would be above an HI of 3.

Rules Affected, Authorities and Supporting Documents

Lead division
Cleaner Air Oregon/ Air Quality, Headquarters

Program or activity
Cleaner Air Oregon

Chapter 340 action

Adopt				
340-245-0320				
Amend				
340-245-0005	340-245-0020	340-245-0050	340-245-0200	340-245-8010
340-245-8030	340-245-8040			

Statutory Authority - ORS				
468.020	468A.025	468A.050	468A.155	2018 Or. Laws Chapter 102.
468.065	468A.040	468A.070	468A.315	

Statutes Implemented - ORS				
468.065	468A.015	468A.035	468A.050	468A.155
468A.010	468A.025	468A.040	468A.070	468A.315
2018 Or. Laws Chapter 102				

Legislation
Senate Bill 1541, approved in April 2018, established the basis for this Hazard Index rulemaking.

Documents relied on for rulemaking

Document title	Document location
Cleaner Air Oregon rulemaking Staff Report	https://www.oregon.gov/deq/regulations/rulemaking/pages/rcleanerair2017.aspx

Fee Analysis
This rulemaking does not involve any fees in addition to those already required under the Cleaner Air Oregon program.

Statement of Fiscal and Economic Impact

This Hazard Index rulemaking proposes amendments and updates to the existing Cleaner Air Oregon program rules, adopted by the Environmental Quality Commission in November 2018. In the program rules, a noncancer hazard index benchmark (known as the "Risk Action Level") for existing facility risk assessments of 5 was adopted, as established in Senate Bill 1541 (SB 1541) enacted by the 2018 Oregon legislature. In addition to establishing program requirements for CAO rules, SB 1541 includes a provision that allows the Department to develop regulations to set lower noncancer hazard index benchmarks for certain toxic air contaminants that are expected to cause severe human health impacts. This language is contained in Section 7 of SB 1541.

The proposed HI rules would amend the existing CAO program rules by changing the RALs for certain noncancer toxic air contaminants and adding implementation requirements to the existing CAO program rules. The proposed rules are only applicable to existing permitted facilities, and would:

- Lower the TBACT Risk Action Levels for 158 contaminants from an HI 5 to an HI 3, out of a total of 182 contaminants with noncancer health effects regulated under the CAO program;
- Establish a methodology to calculate a TBACT Risk Action Level for existing facilities that emit a mixture of noncancer toxic air contaminants regulated at both HI 3 and HI 5; and
- Update other associated Risk Action Levels that are based on the TBACT Action Level (Risk Reduction Level, Immediate Curtailment Level).

Adoption of the proposed HI rules is not expected to generate significant fiscal impacts. Fiscal impacts considered can be positive or negative. As examples, reducing health costs to the public would be a positive impact, and increasing costs of regulatory compliance for businesses would be a negative impact.

There are approximately 2,701 facilities (private businesses and some government and public entities) that hold air contamination discharge permits and that would be subject to these rules. Under the CAO program, DEQ expects that approximately 15 to 20 total existing facilities will be called-in each year to demonstrate compliance. The proposed rules apply to existing facilities that emit toxic air contaminants with noncancer health effects, when such facilities are called-in to demonstrate compliance with CAO rules. Under the proposed rules, these facilities may be required to reduce toxic air contaminant emissions to a more health-protective benchmark, or Risk Action Level. The proposed rules are expected to have mostly minimal and in some cases insignificant overall fiscal and economic impacts, but could have more significant impacts on a limited number of existing facilities.

The rules also may result in health benefits to the public.

Relationship to Prior Cleaner Air Oregon Fiscal Impact Statement

In the 2018 Fiscal Impact Statement provided by the Oregon Department of Environmental Quality for the CAO program rules, DEQ assumed that 182 chemicals with noncancer

effects emitted from existing sources would be assigned a non-cancer hazard index benchmark of 5.

DEQ used the best available information to estimate potential fiscal impacts for the CAO program rules. Table 2 of this HI Fiscal Impact Statement summarizes information developed for the Cleaner Air Oregon program's Fiscal Impact Statement (presented there as Table 8). That analysis concluded it was not possible to quantify fiscal impacts due to the lack of detailed facility-specific data and completed risk analyses, and therefore the cost of any controls that may be required. A similar conclusion was reached regarding potential fiscal impacts related to benefits to public health in affected communities. However, DEQ determined that CAO rules could cause a significant fiscal impact for small businesses. The CAO Fiscal Impact Statement describes cost mitigation measures included in the proposed rules to reduce the overall potential costs of the CAO regulations to both small and large businesses.

The 2018 Fiscal Impact Statement information is relevant to and informs this current HI rulemaking Fiscal Impact Statement, which is limited to potential fiscal impacts associated with the proposed change to current CAO program rules. This HI rulemaking will affect potential risk reduction activities that existing facilities may be required to undertake if they emit toxic air contaminants designated in these rules as HI3 contaminants and if their assessed risk exceeds the revised RALs of these rules. The impact would be incremental if the facility would also exceed the existing benchmark of HI5. New facilities are unaffected by these rules, and are regulated based on an HI of 1. While exact cost impacts remain unquantifiable (consistent with the conclusions of the CAO program Fiscal Impact Statement), the overall fiscal impacts of this HI rulemaking are anticipated to be significantly lower due to the limited scope of impact of these proposed rules when compared to the overall CAO program.

Fiscal and Economic Impact

Adoption of the proposed HI rules is not expected to generate significant fiscal impacts. There may be minimal impacts to some sources. For a limited number of the existing facilities, including small businesses, which are to be regulated under the proposed HI rules, it is possible that the proposed rules could have a more significant impact. However, until more facilities complete health risk assessments that include changes related to the proposed HI rules, exact cost estimates are not quantifiable.

Statement of Cost of Compliance

State and federal agencies

There may be direct impacts to DEQ due to assistance and review of deliverables that will be related to the requirements of the proposed Hazard Index rules. Impacts could include increased review time of analyses and reports for facilities emitting a mixture of chemicals with different benchmarks. However, these impacts are likely to be minimal in light of the larger related resources needed by DEQ to oversee facilities regulated by Cleaner Air Oregon.

Because the Cleaner Air Oregon program rules regulate emissions sources that are privately owned, state and federal agencies are expected to be minimally or not directly impacted by the proposed HI rules. However, existing state and federal agencies that operate facilities that emit toxic air contaminants may be required to reduce toxic air contaminant emissions if the predicted noncancer risk exceeds the proposed TBACT Risk Action Level based on the proposed lowered benchmarks. The impact would be incremental if the facility would also exceed the existing TBACT Risk Action Level of HI 5.

As of Aug. 21, 2019, state agencies own 24 permitted facilities and federal agencies own seven permitted facilities. Currently there are no permitted facilities owned by Tribal governments.

Local governments

Currently, local governments own or operate 69 facilities requiring an air quality permit, some of which may include toxic air contaminants affected by the proposed HI rules. When called in to demonstrate compliance with the CAO rules, some agencies may choose to perform a more in-depth risk assessment to demonstrate compliance with lower Risk Action Levels, which would increase assessment costs and permitting fees. These potential impacts to local government agencies would be minimal.

Facilities that exceed the proposed Risk Action Levels, but do not exceed the existing Risk Action Levels may be required to reduce risk to demonstrate compliance with lower Risk Action Levels. The impact would be incremental if the facility would also exceed the existing benchmark of HI 5. Depending on the size and nature of the operation, pollution control costs could be much less than, or in some cases the same as, the cost ranges for different types of control equipment found in Table 2.

Table 2 summarizes information developed for the overall Cleaner Air Oregon program's Fiscal Impact Statement. If the calculated noncancer risk were above the new proposed Risk Action Levels (but not the existing Action Levels), the proposed rules could result in additional costs ranging from approximately $13,000 to $18,500,000 for initial equipment including purchase and labor, and ranging from approximately $400 to $7,600,000 in annual operating costs. A facility could offset these costs through other reduction options, such as production changes, product substitution, and pollution prevention actions.

DEQ is not able to quantify these fiscal impacts until additional risk assessments have been completed. Based upon a review of completed risk assessment for facilities in other states, it is likely few existing facilities will incur increased cost as many similar facilities pose little risk.

Public

The existing Cleaner Air Oregon program has the potential to meaningfully impact public health in the state by reducing toxic air contaminant emissions. The toxic air contaminants that are regulated by Cleaner Air Oregon rules are known to increase risk of a wide range of health outcomes including cardiovascular and respiratory illness, lung disease, birth defects,

premature births, developmental disorders, central nervous system damage, intellectual disability, and premature death.

These proposed HI rules may lower the level of community exposures allowed under Cleaner Air Oregon for a subset of regulated toxic air contaminants that are expected to cause developmental problems in babies and children, or cause other severe human health effects. Lowering the level of allowed community exposures to this subset of toxic air contaminants would mean that communities surrounding existing facilities will have greater public health protection than in the current rules.

DEQ and OHA do not currently have enough information about how many people are exposed to specific concentrations of industrial and commercial toxic air contaminant emissions to quantify the reduced health care costs that may result from the proposed rules. In addition, communities are exposed to risk from other sources of air pollution not associated with nearby industrial emissions, such as from vehicle engines, construction equipment and wood burning. It is difficult to estimate the relative actual contribution of toxic air contaminants to disease to know how reducing emissions will translate to improved public health and the associated reduced health care costs associated with these potential improvements at industrial facilities. Therefore, in this analysis it is not possible to predict the total reduced medical costs that would result from the proposed HI rules.

Large businesses - businesses with more than 50 employees

There are approximately 1,152 existing large businesses holding air quality permits. Under the CAO program, DEQ expects that approximately 15 to 20 total sources (mainly larger businesses) will be called in each year to demonstrate compliance. When called in to demonstrate compliance with CAO rules, DEQ anticipates that the proposed HI rules could have fiscal or economic impacts on such businesses. To demonstrate compliance with the CAO rules, some large businesses may choose to perform a more in-depth risk assessment to demonstrate compliance with lower Risk Action Levels, which would increase assessment costs and permitting fees.

If the facility’s noncancer risk exceeds the lower proposed TBACT Risk Action Level (Toxics Best Available Control Technologies), but would not have exceeded the current HI 5 TBACT Risk Action Level, the facility would be required to take action to reduce toxic air contaminant emissions or show that TBACT is in place or will be installed. Taking those steps would have a fiscal impact on such a facility. The impact would be incremental if the facility would also exceed the existing benchmark of HI 5. Incremental additional costs may be incurred if the facility also would exceed the revised Risk Reduction Level or Curtailment Levels, but would not have exceeded the existing levels.

Depending on the size and nature of a large business's operation, pollution control costs could be much less than, or in some cases the same as, the cost ranges for different types of control equipment found in Table 2. Table 2 summarizes information developed for the Cleaner Air Oregon program’s Fiscal Impact Statement and presented there as Table 8. If a large business's noncancer risk were above the new proposed Risk Action Levels (but not the existing Action Levels), the proposed rules could result in additional costs ranging from

approximately $13,000 to $18,500,000 for initial equipment including purchase and labor, and ranging from approximately $400 to $7,600,000 in annual operating costs. A facility could offset these costs through other reduction options, such as production changes, product substitution, and pollution prevention actions.

However, determining which permitted facilities would incur this incremental cost requires a completed risk assessment. Because no risk assessments of existing facilities have been completed, DEQ does not have adequate information to estimate potential total costs to existing facilities being regulated under the proposed HI rules.

Small businesses – businesses with 50 or fewer employees

There are approximately 1,046 small businesses with air permits that are subject to these rules. These businesses include asphalt plants, auto body shops, chromium electroplaters, dry cleaners, ethylene oxide sterilizers, grain elevators, gas stations, lumber mills, metal fabricators, metal foundries, and surface coaters.

In addition, there are 503 businesses with AQ permits that have not provided DEQ with information on the number of employees at each business, but are likely to be small businesses with 50 or fewer employees. The majority (397) of these businesses with unknown numbers of employees are gasoline stations with convenience stores, or other types of gasoline stations that may also provide other services such as vehicle repair and selling automotive oils and replacement parts. Thirty (30) of the 503 facilities are dry-cleaning businesses. These types of businesses are likely to have 50 or less employees. Of the 503 businesses with unknown numbers of employees, 492 have Basic or General ACDP permits. As described below, DEQ will likely perform Level I risk assessments for facilities having Basic or General permits, which will mitigate costs to those businesses.

Under the CAO program, DEQ expects that approximately 15 to 20 total sources (mainly larger businesses) will be called in each year to demonstrate compliance. When called-in to demonstrate compliance with CAO rules, DEQ anticipates that the proposed HI rules could have fiscal or economic impacts on such small businesses. If the facility's noncancer risk exceeds the lower proposed TBACT Risk Action Level, but would not have exceeded the current HI 5 TBACT Risk Action Level, the facility would be required to take action to reduce toxic air contaminant emissions or show that best available control technologies for air toxics are in place or will be installed. Taking those steps would have a fiscal impact on such a facility. The impact would be incremental if the facility would also exceed the existing benchmark of HI 5. Incremental additional costs may be incurred if the facility also would exceed the revised Risk Reduction Level or Curtailment Levels, but would not have exceeded the existing levels.

Many of the small businesses subject to the Cleaner Air Oregon rules would only be required to submit triennial reports of toxic air contaminant emissions and would face no additional cost from these proposed rules.

Some small businesses may be required to further reduce toxic air contaminant emissions through either permit limits, pollution prevention or pollution control equipment if risk is

above the lower Risk Action Level. The impact would be incremental if the facility would also exceed the existing benchmark of HI 5. However, DEQ does not have adequate data to estimate how many small businesses may be required to comply with a lower Action Level as a result of the proposed HI rules. In addition, many permitted small businesses with General or Basic permits are currently not being called in to complete risk assessments.

Therefore, the exact fiscal impact of the proposed HI rules cannot be calculated, but is expected to have minimal additional fiscal impacts to small businesses.

Cost of Compliance for Small Businesses

1. Estimated number of small businesses and types of businesses and industries with small businesses subject to proposed rule.

There are approximately 1,046 documented small businesses in Oregon subject to CAO rules as of August 2019. These businesses include asphalt plants, auto body shops, chromium electroplaters, ethylene oxide sterilizers, grain elevators, lumber mills, metal fabricators, metal foundries, and surface coaters. If one of these small businesses is called in to demonstrate compliance with CAO rules, it would be subject to, and could be affected by, these HI rules.

2. Projected reporting, recordkeeping and other administrative activities, including costs of professional services, required for small businesses to comply with the proposed rule.

Again, this rule may apply to a small business only if they are one of the 15-20 sources that are called in annually to demonstrate compliance with CAO rules. At that time, if the small business's calculated noncancer risk exceeds the lower proposed Risk Action Levels, but would not have exceeded the current HI 5 Risk Action Levels, the facility would be required to take action to reduce toxic air contaminant emissions or show that best available control technologies for air toxics are in place or will be installed. Taking those steps would have a fiscal impact on that small business, including increased recordkeeping and reporting requirements. Administrative activities, including costs of professional services required for small businesses to comply with the proposed rule, may increase in a range from $100 to $500,000 above current costs if the small business is required to perform computer modeling or a health risk assessment and cancer risk, chronic noncancer risk or acute noncancer risk is above the proposed Risk Action Levels.

DEQ does not have information about how many more small businesses would be required to take action to reduce risks under the proposed rules, and therefore cannot accurately estimate an incremental increase in costs.

3. Projected equipment, supplies, labor and increased administration required for small businesses to comply with the proposed rule.

As described above, the proposed HI rules may require some small businesses to take action to reduce risk that otherwise would not have had to. Depending on the size and nature of a small business's operation, pollution control costs could be much less than, or in some cases

the same as, the cost ranges for different types of control equipment found in Table 2. Table 2 summarizes information developed for the Cleaner Air Oregon program's Fiscal Impact Statement and presented there as Table 8.

If a small business's noncancer risk were above the new proposed Risk Action Levels (but not the existing Action Levels), the proposed rules could result in additional costs ranging from approximately $13,000 to $18,500,000 for initial equipment including purchase and labor, and ranging from approximately $400 to $7,600,000 in annual operating costs. A facility could offset these costs through other reduction options, such as production changes, product substitution, and pollution prevention actions.

DEQ does not have information about how many more small businesses would be required to take action to reduce risks under the proposed rules, and therefore cannot accurately estimate an incremental increase in costs. Considering existing program implementation, it is predicted that this could affect a very small number of businesses.

4. Describe how DEQ involved small businesses in developing this proposed rule.

DEQ notified small businesses during HI rule development by email through GovDelivery, announcements on the DEQ website, at HI Rules Advisory Committee meetings, and through Twitter and Facebook. Small business representatives were on the HI Rules Advisory Committee and Fiscal Advisory Committee during HI rule development. At the onset of the public comment period, DEQ will notify small businesses by email and through notices in the Secretary of State Bulletin.

Mitigation measures for small businesses

The extent of the small business fiscal impact is unknown and cannot be accurately quantified for analysis because it depends on future analysis of noncancer risk for existing facilities.

These proposed rules do not establish any new mitigation measures for small businesses. However, consistent with existing CAO rules, the majority of small business facilities with few emission units and on General or Basic Air Contaminant Discharge Permits are not currently required to perform a Cleaner Air Oregon risk assessment or address reductions; DEQ will perform the risk assessments for these businesses. As described on page 49 of the FIS for the CAO program rule, DEQ established the following mitigation measures:

- Tiered implementation of the program which would delay regulatory costs for most smaller businesses
- Additional time for compliance with risk levels through extensions and postponement proposals
- DEQ doing level 1 risk assessments for sources on General and Basic Air Contaminant Discharge Permits
- Process to allow postponement of risk reduction requirements based on financial hardship
- DEQ and OHA staff positions for technical assistance

Table 2
Pollution Control Equipment for Toxic Air Contaminant Emissions

Control Device Type	Types of Pollutants it can reduce	Examples of facilities where this could be used	Initial costs[1], [2]		Annual Operating Costs	
			low	high	low	high
Fabric filter (baghouse)	Particulate matter (PM), hazardous air pollutant (HAP) PM	Asphalt batch plants, concrete batch kilns, steel mills, foundries, fertilizer plants, and other industrial processes. Colored art glass manufacturers.	$360,000 - $18,500,000		$180,000 - $6,200,000	
Electrostatic precipitator (ESP)	PM, HAP PM	Power plants, steel and paper mills, smelters, cement plants, oil refineries	$320,000 - $10,000,000		$100,000 - $7,600,000	
Enclosure	Fugitive PM or volatile organic compounds (VOCs)	Any process or operation where emissions capture is required, i.e., printing, coating, laminating	$14,000 - $420,000		$400 - $10,000	
HEPA filter	Chrome emissions	chrome plating	$13,000 - $240,000		Application specific	
Wet scrubber (packed towers, spray chambers, Venturi scrubbers)	Gases, vapors, sulfur oxides, corrosive acidic or basic gas streams, solid particles, liquid droplets	Asphalt and concrete batch plants; coal-burning power plants; facilities that emit sulfur oxides, hydrogen sulfide, hydrogen chloride,	$25,000 - $750,000		$19,000 - $830,000	

[1] Costs are from examples in the EPA Air Pollution Control Cost Manual, Report No. 452/B-02-001, EPA Air Pollution Control Technology Fact Sheets, and information provided by permitted facilities and regulatory agencies.
[2] Costs are estimated based on best available information, but may be higher or lower than shown, depending on facility-specific conditions and business decisions.

Control Device Type	Types of Pollutants it can reduce	Examples of facilities where this could be used	Initial costs[1], [2]		Annual Operating Costs	
			low	high	low	high
		ammonia, and other gases that can be absorbed into water and neutralized with the appropriate reagent.				
Wet scrubber with mercury controls (carbon injection or flue gas desulfurization)	Gases, vapors, sulfur oxides, corrosive acidic or basic gas streams, solid particles, liquid droplets, mercury	Coal-fired power generation	Low end cost not available High end cost $516,803,000		Not available	
Semi-dry scrubber with carbon injection mercury controls	Gases, vapors, sulfur oxides, corrosive acidic or basic gas streams, solid particles, liquid droplets, mercury	Coal-fired power generation	Ranges not available, estimated cost: $470,803,000		Ranges not available, estimated cost: $74,807,000	
Flue gas desulfurization with limestone injection	mercury	Coal-fired power generation	$75,000,000-$247,000,000		$3,500,000	
Activated carbon injection	mercury	Coal-fired power generation	$960,000-$5,000,000		$1,800,000	
Thermal oxidizer	VOCs, gases, fumes, hazardous organics, odors, PM	Landfills, crematories, inks from graphic arts production and printing, can and	$17,000 - $6,200,000		$3,500 - $5,200,000	

Control Device Type	Types of Pollutants it can reduce	Examples of facilities where this could be used	Initial costs[1], [2]		Annual Operating Costs	
			low	high	low	high
		coil plants, hazardous waste disposal. semiconductor manufacturing				
Regenerative thermal oxidizer	VOCs	Paint booths, printing, paper mills, municipal waste treatment facilities	$940,000 - $7,700,000		$110,000 - $550,000	
Catalytic reactor	VOCs, gases	Landfills, oil refineries, printing or paint shops	$21,000 - $6,200,000		$3,900 - $1,700,000	
Carbon adsorber	Vapor-phase VOCs, hazardous air pollutants (HAPs)	Soil remediation facilities, oil refineries, steel mills, printers, wastewater treatment plants	$360,000 - $2,500,000		Not available	
Biofilter	VOCs, odors, hydrogen sulfide (H_2S), mercaptans (organic sulfides)	Wastewater treatment plants, wood products facilities, industrial processes	$360,0000 - $3,600,000		Not available	
Fume suppressants	Chromic acid mist, chromium, cadmium and other plating metals	Chromic acid anodizing and chrome plating operations	Up to $122,000		Not available	

These cost ranges were researched in 2018. The Consumer Price Index measures the change in prices paid by consumers for goods and services in the United States. In 2018, the CPI rose approximately 2 percent, and 2019 appears to be on track for a similar rise. Assuming that one year has passed since the cost ranges were identified in 2018 in the CAO Fiscal Impact Statement, it is logical to assume that there will be a total of a 2 percent increase for each of the cost ranges. DEQ does not expect that the fiscal impacts of this proposed rulemaking would be outside the estimated ranges documented in the CAO Fiscal Impact Statement.

Documents relied on for fiscal and economic impact

The documents listed below are related to Table 2. Table 2 presents information from Table 8 in the Cleaner Air Oregon program Fiscal Impact Statement, which itself is a source of information for preparing this Fiscal Impact Statement.

Document title	Document location
Cleaner Air Oregon Staff Report	https://www.oregon.gov/deq/EQCdocs/11152018_ItemG_CAOReport.pdf
EPA Air Pollution Control Cost Manual, Report No. 452/B-02-001, December 1995, Section 5, Chapter 1, SO_2 and Acid Gas Controls	http://www.epa.gov/ttn/catc/dir1/cost_toc.pdf
EPA Air Pollution Control Cost Manual, Report No. 452/B-02-001, January 2002, Section 6, Chapter 1, Baghouses and Filters	http://www.epa.gov/ttn/catc/dir1/cost_toc.pdf
EPA Air Pollution Control Cost Manual, Report No. 452/B-02-001, September 1999, Section 6, Chapter 3, Electrostatic Precipitators	https://www3.epa.gov/ttn/ecas/docs/cs6ch3.pdf
EPA Technical Bulletin Choosing an Adsorption System for VOC: Carbon, Zeolite, or Polymers? May 1999	https://www3.epa.gov/ttncatc1/cica/files/fadsorb.pdf
EPA Pollution Control Technology Fact Sheet Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016	https://www3.epa.gov/ttncatc1/cica/files/fsprytwr.pdf
EPA Air Pollution Control Technology Fact Sheet Catalytic Incinerator, EPA-452/F-03-018	https://www3.epa.gov/ttncatc1/cica/files/fcataly.pdf
EPA Air Pollution Control Technology Fact Sheet Regenerative Incinerator, EPA- 452/F-03-021	https://www3.epa.gov/ttncatc1/cica/files/fregen.pdf
EPA Air Pollution Control Technology Fact Sheet Thermal Incinerator, EPA-452/F-03-022	https://www3.epa.gov/ttncatc1/cica/files/fthermal.pdf

EPA Air Pollution Control Technology Fact Sheet, Paper/Nonwoven Filter – High Efficiency Particle Air (HEPA) Filter, EPA-452/F-03-023	https://www3.epa.gov/ttncatc1/cica/files/ff-hepa.pdf
EPA Pollution Control Technology Fact Sheet Fabric Filter – Mechanical Shaker Cleaned Type, EPA-452/F-03-024	https://www3.epa.gov/ttncatc1/cica/files/ff-shaker.pdf
EPA Air Pollution Control Technology Fact Sheet Dry Electrostatic Precipitator (ESP) – Wire-Plate Type, EPA-452/F-03-028	https://www3.epa.gov/ttncatc1/cica/files/fdespwpl.pdf
EPA Air Pollution Control Technology Fact Sheet Permanent Total Enclosures (PTEs), EPA-452/F-03-033	https://www3.epa.gov/ttncatc1/cica/files/fpte.pdf

Advisory committee fiscal review

DEQ appointed a Fiscal Advisory Committee, which met on Sept. 23, 2019, to discuss the draft Fiscal Impact Statement presented by DEQ.

As ORS 183.33 requires, DEQ asked for the committee's recommendations on:

- Whether the proposed rules would have a fiscal impact,
- The extent of the impact, and
- Whether the proposed rules would have a significant adverse impact on small businesses; and if so, then how DEQ can comply with ORS 183.540 reduce that impact.

The committee reviewed the draft fiscal and economic impact statement and its findings are summarized in the approved minutes dated Sept. 23, 2019.

All committee members agreed that the proposed rules would have a fiscal impact. In regard to the extent of the fiscal impact, the committee members provided a number of responses, which are available in the approved minutes mentioned above.

The committee discussed whether the proposed rules would have a significant adverse fiscal impact on small businesses in Oregon. Some members felt the proposed rules would have little to no fiscal impact, while others felt that the proposed rules could have significant impacts. To address any potential significant impacts to small businesses, a number of mitigating actions were suggested:

1.) DEQ should provide technical assistance to small businesses.
   - Assist small businesses with health risk assessment preparation.
   - Collect and share information, resources, and data regarding the CAO program to help small businesses better understand requirements of the rules and related health impacts.
   - Provide assistance to make sure affected communicates are engaged.

2.) DEQ should provide financial assistance to small businesses.
- Set aside money for a grant program to help small businesses purchase pollution control equipment or for assistance with pollution prevention studies.
- Waive or reduce certain program fees for small businesses.
- Provide low-interest loans or bonds to small businesses for work related to the rule.
- Use a portion of required compliance fees to help with costs to small businesses.
- Discount the fees for small businesses.

3.) Extend compliance timelines for small businesses.
- Consider extending timelines for small businesses because of the uncertainty that some committee members felt was inherent in the propose rulemaking.
- One committee member thought that the proposed shift from an HI benchmark of 5 to an HI benchmark of 3 should be deferred until 2029.

4.) Additional suggestions.
- Mitigation activities for small businesses should also be applied to large businesses.
- Be very aware of the possible cumulative health benefits that public health officials believe will occur as a result of reducing hazardous chemicals from our environment.
- Make sure that DEQ staff are updated regularly on regulations, impacts and improvements.
- DEQ should present mitigation ideas and measures to the EQC so that they can help keep all benefits to public health and to businesses maximized.
- Be more specific in the Fiscal Impact Statement about the likelihood of small businesses being impacted in the short run.

Housing Cost

As required by ORS 183.534, DEQ evaluated whether the proposed rules would have an effect on the development cost of a 6,000-square-foot parcel and construction of a 1,200-square-foot detached, single-family dwelling on that parcel.

While DEQ determined that the Cleaner Air Oregon program rules may have an effect on the development cost of a 6,000-square-foot parcel and construction of a 1,200- square-foot detached, single-family dwelling on that parcel, these proposed HI rules are predicted to have little to no impact on housing cost. The possible impact of these potential changes appears to be minimal. DEQ cannot quantify the impact at this time because the available information does not indicate whether the costs would be passed on to consumers and any such estimate would be speculative.

Federal Relationship

ORS 183.332, 468A.327 and OAR 340-011-0029 require DEQ to attempt to adopt rules that correspond with existing equivalent federal laws and rules unless there are reasons not to do so.

DEQ adopted Cleaner Air Oregon rules in 2018 that are in addition to federal requirements because regulatory gaps existed in the state's air toxics rules prior to 2018. The proposed HI rules will be an addition to the existing CAO rules.

Land Use

Considerations

In adopting new or amended rules, ORS 197.180 and OAR 340-018-0070 require DEQ to determine whether the proposed rules significantly affect land use. If so, DEQ must explain how the proposed rules comply with state wide land-use planning goals and local acknowledged comprehensive plans.

Under OAR 660-030-0005 and OAR 340 Division 18, DEQ considers that rules affect land use if:

- The statewide land use planning goals specifically refer to the rule or program, or
- The rule or program is reasonably expected to have significant effects on:
- Resources, objects, or areas identified in the statewide planning goals, or
- Present or future land uses identified in acknowledge comprehensive plans

DEQ determined whether the proposed rules involve programs or actions that affect land use by reviewing its Statewide Agency Coordination plan. The plan describes the programs that DEQ determined significantly affect land use. DEQ considers that its programs specifically relate to the following statewide goals:

Goal	Title
5	Natural Resources, Scenic and Historic Areas, and Open Spaces
6	Air, Water and Land Resources Quality
11	Public Facilities and Services
16	Estuarine Resources
19	Ocean Resources

Statewide goals also specifically reference the following DEQ programs:

- Nonpoint source discharge water quality program – Goal 16
- Water quality and sewage disposal systems – Goal 16
- Water quality permits and oil spill regulations – Goal 19

Determination

DEQ determined that these proposed rules do not affect land use under OAR 340-018-0030 or DEQ's State Agency Coordination Program.

EQC Prior Involvement

DEQ shared information about this rulemaking with the EQC on multiple occasions, including:

- As an Informational Item (Item B, Cleaner Air Oregon updates) on the March 2018 EQC meeting agenda.
- As an Action Item (Item G, Cleaner Air Oregon Hazard Index Technical Advisory Committee) on the July 2018 EQC meeting agenda
- As an Informational Item (Item F, Director's Report) on the January 2019 EQC meeting agenda
- During staff conference calls with individual EQC members on Sept. 9, 10, 13, and 16, 2019.
- Presented an information update to the Environmental Quality Commission during their November 2019 meeting.

Advisory Committee

Background

DEQ convened the Cleaner Air Oregon Hazard Index Rules Advisory Committee in a public meeting on July 10, 2019. On Sept. 23, 2019, the committee met again as the Fiscal Advisory Committee in a public meeting to consider the HI rules and draft Fiscal Information Statement. Advisory committee members are listed in the table below and additional information is available on the committee's webpage: https://www.oregon.gov/deq/Regulations/rulemaking/Pages/rcaohi2019.aspx.

CAO Hazard Index Rules Advisory Committee	
Name	**Representing**
Steven Anderson	City of Salem Neighborhood Associations (neighborhood-level community-based group)
Jessica Applegate	Eastside Portland Air Coalition (neighborhood-level community-based group)
Lisa Arkin	Beyond Toxics
Lee Fortier	Rogue Disposal (business owner small business)
Dr. Linda George	Portland State University (academic)
Scott Henriksen	Eastside Plating (small business)
Christine Kendrick	City of Portland (large cities)
Patrick Luedtke	Community Health Centers of Lane County (health official, Lane County)
Paul Lewis	Multnomah County (tri-county health official – Multnomah, Washington, Clackamas counties)
Sharla Moffett	Oregon Business and Industry (small business)
Huy Ong	Organizing People/Activating Leaders (community organization -general)
Mary Peveto	Neighbors for Clean Air
Ellen Porter	LMI Environmental, Inc.
Mark Riskedahl	Northwest Environmental Defense Center
Diana Rohlman	Oregon Public Health Association (health professional)
Laura Seyler	International Paper Springfield Mill (engineer/experience in pollution control technology for air toxics)

Kathryn VanNatta	Northwest Pulp and Paper Association (business owner large business)
Thomas Wood	Oregon Business and Industry (large business)
Gordon Zimmerman	City of Cascade Locks (small cities)

Meeting notifications

To notify people about the advisory committee's activities, DEQ:

- Sent GovDelivery bulletins, a free e-mail subscription service, to the following lists:
  - Rulemaking
  - Air Toxics State-wide
  - Cleaner Air Oregon Regulatory Overhaul
  - DEQ Public Notices
  - Title V Permit Program
- Added advisory committee announcements to DEQ's calendar of public meetings at DEQ Calendar.

Committee discussions

The committee evaluated, discussed, and gave recommendations regarding the potential rule proposals and fiscal impacts during public meetings held on July 10, 2019 and September 23, 2019. Detailed information on the information the committee reviewed and on their discussions and recommendations can be found on the committee's webpage: https://www.oregon.gov/deq/Regulations/rulemaking/Pages/rcaohi2019.aspx

Public Engagement

Public notice

DEQ provided notice of the proposed rulemaking and rulemaking hearing by:

- On Oct. 25, 2019, Filing notice with the Oregon Secretary of State for publication in the Nov. 1, 2019, Oregon Bulletin;
- Posting the Notice, Invitation to Comment and Draft Rules on the web page for this rulemaking, located at: https://www.oregon.gov/deq/Regulations/rulemaking/Pages/rcaohi2019.aspx ;
- Emailing approximately 14,221 interested parties on the following DEQ lists through GovDelivery:
    - Rulemaking
    - DEQ Public Notices
    - Cleaner Air Oregon
    - Air Toxics State-wide
- Emailing the following key legislators required under ORS 183.335:
    - Representative Karin Power, Chair, House Committee on Energy and Environment
    - Senator Michael Dembrow, Chair, Senate Committee on Environment and Natural Resources
    - Senator Peter Courtney, Senate President
    - Representative Tina Kotek, Speak of the House of Representatives
- Emailing advisory committee members,

Posting on the DEQ event calendar: DEQ Calendar

How comments on this rulemaking proposal were obtained

DEQ asked for public comment on the proposed rules. Anyone could submit comments and questions about this rulemaking. A person could submit comments via email, by regular mail or at the public hearing. DEQ only considered comments on the proposed rules that DEQ received by 4 p.m. on Dec. 18, 2019. DEQ considered all comments and testimony received before the closing date. DEQ has summarized all comments and respond to comments in this staff report.

Public Hearing

DEQ held one public hearing. DEQ received one verbal comment and a related written comment at the hearing. Later sections of this document include a summary of the 202 comment submittals received during the open public comment period, DEQ's responses, and a list of the commenters. Original comments are on file with DEQ.

Hearing 1

Date	Nov. 18, 2019
Place	Third Floor Conference Room, 700 NE Multnomah Street, Portland, OR, 97232
Start Time	6 p.m.
End Time	8 p.m.
Presiding Officer	Karen Williams

Presiding Officer's report

The presiding officer convened the hearing, summarized procedures for the hearing, and explained that DEQ was recording the hearing. The presiding officer asked people who wanted to present verbal comments to sign the registration list, or if attending by phone, to indicate their intent to present comments. The presiding officer advised all attending parties interested in receiving future information about the rulemaking to sign up for GovDelivery email notices.

As Oregon Administrative Rule 137-001-0030 requires, the presiding officer summarized the content of the rulemaking notice.

The presiding officer opened the teleconference line and the webinar at approximately 6 p.m. Five members of the public signed in and were present in the hearing room; they were Gregory Sotir (Cully Air Action Team), Greg Korst (Rypos), Jim McDonald (Miratech), Mikayla Domingo (Willamette Falls Paper Company), and Daniel Forbes, reporter. Five people announced themselves on the teleconference line; they were Nadège Dubuisson from Multnomah County, Gabriela Goldfarb from OHA, Kathryn Van Natta (Northwest Pulp and Paper Association), Ashley Bennett, and Katherine Salzmann. Several DEQ staff were also present in the audience. The presiding officer explained that the purpose of the hearing was to take public comment on a proposed action to amend and adopt proposed rules concerning regulation of risk from toxic air contaminants that have non-cancer human health effects. The presiding officer asked anyone attending who wished to testify to check the box next to their name on the sign-in sheet. The presiding officer said that anyone on the phone who wished to testify would have to identify themselves and the presiding officer would add their name to the sign in sheet and check the box next to their name.

The presiding officer stated that printed information about the proposed rules was available at the front of the room and that this information was also available electronically on the rulemaking webpage. The presiding officer stated that anyone could sign up on the

rulemaking webpage to receive email notices about the rulemaking. The presiding officer stated that the comment period would close on Friday, November 22, 2019 at 4 p.m. and then explained the hearing format.

Following introductions, Sue MacMillan delivered an informational presentation about the background and subject matter of the Hazard Index Rulemaking. A question and answer period followed.

At 6:35, the presiding officer opened the public hearing, announced that DEQ was recording the hearing as part of the permanent record, and began the recording. The presiding officer called Gregory Sortir forward to testify. Following Gregory Sortir's testimony, the presiding officer asked if anyone in the room or anyone on the phone wished to provide public comments. No other people indicated that they wished to provide comments. The presiding officer adjourned the hearing at approximately 6.45 p.m. and ended the recording.

Summary of Public Comments and DEQ Responses

Public comment period

DEQ accepted public comment on the proposed rulemaking from Oct. 25, 2019 until 4 p.m. on Nov.22, 2019. On the closing date, DEQ received a request for an extension of the public comment period, and so extended the period until 4 p.m. on Dec. 18, 2019.

A summary of public comments received by the close of the public comment period is provided in Attachment B, which presents agency responses to 31 comment categories, and in Attachment C, which contains all comment submittals received. Table B1 in Attachment B provides a table that cross-references the 31 comment categories with the comment numbers to which they are related. DEQ received 201 comment submittals, many of which contained more than one type of comment. One hand-written letter was also received, for a total of 202 comment submittals.

DEQ made two changes to the proposed Hazard Index rules based on submitted public comments. The toxic air contaminants Diesel particulate matter and Oleum are now proposed for regulation at an HI of 3, rather than an HI of 5. This means that 158 of the 182 chemicals evaluated for this rule would be regulated at an HI of 3.

Based on the large number of public comments asking DEQ to regulate diesel particulate matter at a Hazard Index of 3, DEQ and OHA staff did a careful re-review of this chemical using the framework for determining if a chemical is expected to have a severe health effect (i.e. has developmental or reproductive effects, impacts multiple target organs, or listed as an inhalation hazard by the U.S. DOT). The agencies found and consulted a final version of the U.S. EPA Integrated Science Assessment for Particulate Matter, which became available in December 2019. It provided evidence that diesel particulate matter is linked to developmental effects. On this basis, DEQ is proposing to regulate diesel particulate matter at a Hazard Index of 3. Please refer to Attachment B, response to Comment Category #3, for further details.

Based on a public comment asking that oleum be regulated at a Hazard Index of 3, DEQ and OHA staff did a careful re-review of this chemical using the framework for determining if a chemical is expected to have a severe health effect The agencies found that this chemical is listed on the U.S. DOT list, one of the parameters DEQ and OHA used to identify chemicals to be regulated at a Hazard Index of 3. Based on this fact and on the details provided in Attachment B, response to Comment Category #5, DEQ is proposing to regulate oleum at a Hazard Index of 3.

Implementation

Notification

If approved, the proposed rules would become effective upon filing on approximately April 27, 2020. DEQ would notify affected parties by:

- Posting the Staff Report and Rules on the web page for this rulemaking, located at: https://www.oregon.gov/deq/Regulations/rulemaking/Pages/rcaohi2019.aspx ;
- Emailing approximately 14,221 interested parties on the following DEQ lists through GovDelivery:
    - Rulemaking
    - DEQ Public Notices
    - Cleaner Air Oregon
    - Air Toxics State-wide
- Emailing the following key legislators required under ORS 183.335:
    - Representative Karin Power, Chair, House Committee on Energy and Environment
    - Senator Michael Dembrow, Chair, Senate Committee on Environment and Natural Resources
    - Senator Peter Courtney, Senate President
    - Representative Tina Kotek, Speak of the House of Representatives

Compliance and enforcement

For any existing facilities called into the Cleaner Air Oregon program prior to March 19, 2020, DEQ will insure that the facilities understand that the rules for the Hazard Index piece of the CAO rules have been adopted, assuming that any related human health risk assessments being conducted would include an evaluation of noncancer risk from emitted toxic air contaminants.

Five-Year Review

Requirement

Oregon law requires DEQ to review new rules within five years after EQC adopts them. The law also exempts some rules from review. DEQ determined whether the rules described in this report are subject to the five-year review. DEQ based its analysis on the law in effect when EQC adopted these rules. DEQ identified OAR 340-245-0320 as subject to review, while OAR 340-245-0005, OAR 340-245-0020, OAR 340-245-0050, OAR 340-245-0200, OAR 340-245-8010, OAR 340-245-8030, and OAR 340-245-8040 are exempt from review.

Exemption from five-year rule review

The Administrative Procedures Act exempts some the proposed rules from the five-year review because the proposed rules would:

- Amend or repeal an existing rule. ORS 183.405(4).

Five-year rule review required

No later than March 19, 2025, DEQ will review the newly adopted rule 340-245-0320 for which ORS 183.405 (1) requires review to determine whether:

- The rule has had the intended effect
- The anticipated fiscal impact of the rule was underestimated or overestimated
- Subsequent changes in the law require that the rule be repealed or amended
- There is continued need for the rule.

DEQ will use "available information" to comply with the review requirement allowed under ORS 183.405 (2).

DEQ will provide the five-year rule review report to the advisory committee to comply with ORS 183.405 (3).

Accessibility Information

You may review copies of all documents referenced in this announcement at:
Oregon Department of Environmental Quality
700 NE Multnomah St., Ste. 600
Portland, OR, 97232

To schedule a review of all websites and documents referenced in this announcement, call Sue MacMillan, 700 NE Multnomah St. Suite 600, Portland, OR 97232, 503-229-6458. (800-452-4011, ext. 5622 toll-free in Oregon).

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Key to Identifying Changed Text:

~~Strikethrough: Deleted Text~~

Underline: New/inserted text

Division 245

CLEANER AIR OREGON

340-245-0005
Purpose and Overview

(1) This statement of purpose and overview is an aid to understanding the rules in OAR 340-245-0010 through 340-245-8050 that follow, and is not for the purpose of regulation or compliance.

(2) Purpose. The purpose of Oregon's risk-based toxic air contaminant permitting program, known as Cleaner Air Oregon, is to:

(a) Prioritize and protect the health and well-being of all Oregonians with a special focus on sensitive populations such as children;

(b) Analyze public health risk due to toxic air contaminant emissions from industrial and commercial sources based on verified science and data;

(c) Consider similar regulations in other states and jurisdictions and use a science-based, consistent and transparent process for communicating and addressing risks from industrial and commercial emissions of toxic air contaminants, provide regulatory predictability to businesses and the communities they are a part of; and

(d) Reduce exposure to industrial and commercial toxic air contaminant emissions while supporting an environment where businesses and communities can thrive.

(3) Overview.

(a) OAR 340-245-0010, Applicability and Jurisdiction, OAR 340-245-0020, Definitions, and OAR 340-245-0022, Abbreviations and Acronyms, describe which sources the risk-based toxic air contaminant permitting program applies to and specifies definitions, abbreviations and acronyms to be used in the program;

(b) OAR 340-245-0030, Submittal and Payment Deadlines, provides the deadlines by which owners or operators must submit risk assessment compliance information when required by DEQ under this division. That rule generally provides owners or operators more time to submit the more complex assessments;

(c) OAR 340-245-0040, Emissions Inventory, authorizes DEQ to require a source to submit an inventory of all of its toxic air contaminant emissions to be used in a risk assessment and to submit periodic emissions inventory updates;

(d) OAR 340-245-0050, Risk Assessment Procedures, includes requirements and procedures for the owners and operators of sources to undertake any of the four levels of risk assessment to demonstrate compliance and determine what requirements apply. The first level of risk assessment is a conservative estimate that is likely to overestimate risk. As the levels progress from Level 1 to Level 4, the assessments become more complex but also provide increasingly more site-specific and refined risk estimates. An owner or operator can choose to start with any level of risk assessment;

(e) OAR 340-245-0060, Toxic Emissions Units, explains how TEUs are analyzed and regulated in the context of assessing and regulating risk from an entire source. This rule includes the criteria for a TEU to be designated exempt or aggregated because it poses very low risk and the requirements for approval of new and modified TEUs;

(f) OAR 340-245-0100, Toxic Air Contaminant Permit Addenda, includes the procedural requirements for obtaining a permit addendum or a new operating permit under these rules. A Toxic Air Contaminant Permit Addendum will amend the source's Air Contaminant Discharge Permit or Title V Operating Permit until the requirements in the addendum can be incorporated into the source's operating permit, but will remain separate for a source that has a General Air Contaminant Discharge Permit;

(g) OAR 340-245-0110, Source Risk Limits, explains how risk limits will be set in Toxic Air Contaminant Permit Addenda or in operating permits with conditions required under this division;

(h) OAR 340-245-0120, Community Engagement, contains requirements for community engagement meetings and other aspects of community engagement;

(i) OAR 340-245-0130, Risk Reduction Plan Requirements, specifies how an owner or operator of an existing source must develop a plan to reduce risk, if required to do so, because the source risk exceeds the TBACT Level or the Risk Reduction Level. Risk can be reduced using a variety of methods as long as they are enforceable as permit conditions and achieve the required level of risk reduction. Provisions for Voluntary Risk Reduction are included in this rule;

(j) OAR 340-245-0140, Pollution Prevention, explains how the owner or operator of a source must perform a pollution prevention analysis when required under OAR 340-245-0130;

(k) OAR 340-245-0150, Postponement of Risk Reduction, specifies how an owner or operator of a source may request postponement of risk reduction due to financial hardship;

(l) OAR 340-245-0200, Risk Estimates, explains how the owner or operator of a source must perform the calculations required in this division. This rule explains how calculations should be rounded to evaluate compliance with Source Risk Limits;

(m) OAR 340-245-0210, Modeling and Risk Assessment Work Plan Requirements, contains air quality modeling and work plan requirements for owners or operators of sources that are required to assess risk;

(n) OAR 340-245-0220, TBACT and TLAER Procedures, explains how the owner or operator of a source must perform, respectively, a Toxics Best Available Control Technology or Toxics Lowest Achievable Emission Rate analysis;

(o) OAR 340-245-0230, Toxic Air Contaminant Monitoring Requirements, allows an owner or operator of a source to perform air monitoring to determine actual concentrations of toxic air contaminants in the ambient air around a source;

(p) OAR 340-245-0300, 340-245-0310, and 340-245-0320, Toxicity Reference Values, Process for Updating Lists of Regulated Toxic Air Contaminants and Their Risk-Based Concentrations, and Standards and Criteria for Noncancer Risk Action Levels for Existing Sources, describe the list of authoritative sources that publish toxicity information that the EQC considers, upon the recommendation of DEQ, in consultation with OHA, to determine the RBCs, ~~and~~ the process of how the RBCs may be updated, and assignment of hazard index values based on health effects.

(q) OAR 340-245-0400, Cleaner Air Oregon Fees, specifies the permitting fees that apply to sources subject to the rules in this division; and

(r) OAR 340-245-8000 through 340-245-8050, Tables, include the established Risk Action Levels, lists of the regulated toxic air contaminants, the values used to develop Risk-Based Concentrations and the Level 1 Risk Assessment Tool.

(4) The long-term goal of Cleaner Air Oregon is to achieve a 50% reduction in the number of existing sources posing either an excess cancer risk of more than 25 in a million or a Hazard Index of more than 1 by the year 2034.

(5) This program supplements requirements in OAR chapter 340, division 244, Oregon Federal Hazardous Air Pollutant Program, and division 246, Oregon State Air Toxics Program. This program includes four levels of risk assessment and allows sources to choose any level of assessment to assess risk.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3. 7 and 13
Statutes/Other Implemented: ORS 468.065, 468A.010, 468A.015, 468A.025, 468A.035, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 2, 3, 6, 7, ~~,~~ and 13.
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0020
Definitions

The definitions in OAR 340-200-0020, 340-204-0010 and this rule apply to this division. If the same term is defined in this rule and OAR 340-200-0020 or 340-204-0010, the definition in this rule applies to this division.

(1) “ABEL” means a computer model developed by EPA that evaluates a corporation's or partnership's ability to afford compliance costs, cleanup costs or civil penalties. ABEL is available upon request from DEQ.

(2) “Actual toxic air contaminant emission rate” means:

(a) For an existing source, the toxic air contaminant emissions rate from the source’s actual production; or

(b) For a new or reconstructed source, the toxic air contaminant emissions rate from the reasonably anticipated actual production by the new or reconstructed source.

(3) “Acute” means evaluated over a 24-hour period or day.

(4) “Acute exposure location” means an exposure location outside the boundary of a source being modeled for daily average concentrations of a toxic air contaminant, and that is:

(a) A chronic exposure location; or

(b) A location where people may spend several hours of one day.

(5) “AERMOD” is the EPA approved steady-state air dispersion model, specified in 40 CFR part 51, Appendix W, "Guidelines on Air Quality Models (Revised)," that is the primary model used for the analysis of ambient concentrations for regulatory compliance. AERMOD uses a fully developed set of meteorological and terrain data. AERMOD stands for American Meteorological Society/Environmental Protection Agency Regulatory Model. AERMOD is available upon request from DEQ.

(6) “AERSCREEN” is the EPA approved screening dispersion model, specified in 40 CFR part 51, Appendix W, "Guidelines on Air Quality Models (Revised)," based on AERMOD. The model uses conservative screening meteorology to produce estimates of "worst-case" concentration estimates that are equal to or greater than the estimates produced by AERMOD. AERSCREEN stands for American Meteorological Society/Environmental Protection Agency Regulatory Screening Model. AERSCREEN is available upon request from DEQ.

(7) “Aggregate TEU Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, that aggregated TEUs may not exceed, based on a calculation of the cumulative risk of all aggregated TEUs.

(8) “Aggregated TEUs” means all of a source’s TEUs that are identified by an owner or operator with total cumulative risk less than the Aggregate TEU Level. A TEU that is identified as one of the aggregated TEUs is referred to in the singular as an aggregated TEU.

(9) “Area of impact” means the geographic area where risk is determined to be above the applicable Risk Action Level, and is determined by AERMOD or other comparable model approved by DEQ.

(10) “Chronic” means evaluated over a one-year period or longer.

(11) “Chronic exposure location” means an exposure location outside the boundary of a source being modeled for annual average concentrations of a toxic air contaminant, and can be either:

(a) A residential exposure location; or

(b) A non-residential exposure location.

(12) “Community Engagement Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which DEQ will conduct community engagement.

(13) “Construction permit” means a Construction Air Contaminant Discharge Permit issued under OAR chapter 340, division 216, or a Standard Air Contaminant Discharge Permit used for approval of Type 3 or 4 changes under OAR chapter 340, division 210.

(14) “De minimis source” means a source whose excess cancer risk, chronic noncancer risk and acute noncancer risk estimates are each less than or equal to the Source Permit Level in OAR 340-245-8010 Table 1 when calculated based on the source’s capacity, as determined under OAR 340-245-0050(7).

(15) “DEQ notice date” means the date that DEQ sends a notice to an owner or operator that a risk assessment is required.

(16) “Environmental Justice” means equal protection from environmental and health hazards, and meaningful public participation in decisions that affect the environment in which people live, work, learn, practice spirituality, and play. Environmental Justice communities include minority and low-income communities, tribal communities, and other communities traditionally underrepresented in the public process.

(17) “Excess cancer risk” means the probability of developing cancer resulting from exposure to toxic air contaminant emissions from a TEU or an entire source under an applicable exposure scenario, over and above the background rate of cancer. Excess cancer risk is expressed in terms of “X” in a million, and means that approximately “X” number of additional cases of cancer would be expected in a population of one million people subject to the applicable exposure scenario.

(18) “Exempt source” means a source at which all TEUs are exempt TEUs or a source that has no TEUs that emit toxic air contaminants, as determined under OAR 340-245-0050(6).

(19) “Exempt TEU” means a TEU that DEQ has determined is exempt under OAR 340-245-0060(3). An exempt TEU is not required to comply with any other requirements of this division, other than those applicable to qualify as an exempt TEU and OAR 340-245-0060(4)(c)(A).

(20) “Existing source” means a source that:

(a) Commenced construction before November 16, 2018; or

(b) Submitted all necessary applications to DEQ under OAR 340 divisions 210 or 216 before November 16, 2018, and all such applications were deemed complete by DEQ.

(21) “Existing TEU” means a TEU that is not a new or modified TEU.

(22) “Exposure location” means a location where people, including sensitive populations, actually live or normally congregate and will be exposed to a toxic air contaminant present in the air, and thus be the location of an air quality modeling receptor at which toxic air contaminant concentrations and risk are evaluated. Exposure locations are associated with exposure scenarios and identified based on allowed land use zoning, except as allowed under OAR 340-245-0210(1)(a)(F) or when DEQ has sufficient information to determine that an area is being used in a manner contrary to its land use zoning.

(23) “Exposure scenario” means a set of assumptions about how a population is exposed to toxic air contaminants. Included in the assumptions are the type of people exposed (e.g., children or adults), and the frequency and duration of exposure associated with the scenario (e.g., residential or occupational use). Exposure scenarios are associated with exposure locations.

(24) “Fixed capital cost” means the capital needed to purchase and construct all the depreciable components of a source.

(25) “Hazard Index number” or “Hazard Index,” as defined in Oregon Laws 2018, chapter 102, section 2, means a number equal to the sum of the hazard quotients attributable to toxic air contaminants that have noncancer effects on the same target organs or organ systems.

(26) “Hazard quotient,” as defined in Oregon Laws 2018, chapter 102, section 2, means a calculated numerical value that is used to evaluate noncancer health risk from exposure to a single toxic air contaminant. The calculated numerical value is the ratio of the air concentration of a toxic air contaminant to the noncancer Risk-Based Concentration at which no serious adverse human health effects are expected to occur.

(27) “Immediate Curtailment Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which an existing source will not be permitted to postpone risk reduction under OAR 340-245-0160.

(28) “INDIPAY” means a computer model developed by EPA that evaluates an individual's ability to afford compliance costs, cleanup costs or civil penalties. INDIPAY is available upon request from DEQ.

(29) “Inhalation Unit Risk” means the upper-bound lifetime excess cancer risk estimated to result from continuous exposure to a toxic air contaminant at a concentration of 1 $\mu g/m^3$ in air. The interpretation of inhalation unit risk would be as follows: if unit risk = 2×10^{-6} per $\mu g/m^3$, then two excess cancer cases (upper bound estimate) are expected to develop per one million people if exposed daily for 70 years to one microgram of the toxic air contaminant per cubic meter of air.

(30) “Multipathway” means consideration of exposure pathways in addition to inhalation of chemicals in air, such as incidental ingestion and dermal contact with toxic air contaminants migrating to soil and water.

(31) "MUNIPAY" means a computer model developed by EPA that evaluates a municipality's or regional utility's ability to afford compliance costs, cleanup costs or civil penalties. MUNIPAY is available upon request from DEQ.

(32) "New or modified TEU" means a TEU at an existing source where one of the following criteria is met:

(a) Approval to construct or operate under OAR 340-210-0205 through 340-210-0250 was not required for the TEU, and construction commenced on or after November 16, 2018;

(b) Approval to construct or operate under OAR 340-210-0205 through 340-210-0250 is or was required for the TEU, and the owner or operator submitted the application on or after November 16, 2018; or

(c) Approval to construct or operate under OAR 340-210-0205 through 340-210-0250 was required for the TEU, but the owner or operator did not obtain the approval as required, and construction commenced on or after the following, as applicable:

(A) For Type 1 changes under OAR 340-210-0225, 10 days before November 16, 2018;

(B) For Type 2 changes under OAR 340-210-0225, 60 days before November 16, 2018;

(C) For Type 3 changes under OAR 340-210-0225, 120 days before November 16, 2018; and

(D) For Type 4 changes under OAR 340-210-0225, 240 days before November 16, 2018;

(d) With respect to a modification to a TEU, approval to construct or operate refers to approval to construct or operate the modification.

(33) "New source" means a source that is not an existing source.

(34) "Noncancer risk" means the chance of noncancer harmful effects to human health resulting from exposure to toxic air contaminant emissions from a TEU or an entire source under an applicable exposure scenario. There are two types of noncancer risk, chronic and acute. Noncancer risk is expressed numerically using the Hazard Index. Below a Hazard Index of 1, adverse noncancer health effects are unlikely, and above a Hazard Index of 1, adverse noncancer health effects become more likely.

(35) "Nonresident" means people who regularly spend time at a location but do not reside there. This includes, but is not limited to, children attending schools and daycare facilities and adults at workplaces.

(36) "Nonresidential exposure location" means an exposure location outside the boundary of a source where people may reasonably be present for a few hours several days per week, possibly over a period of several years, and that is zoned for uses that do not allow residential use. A nonresidential exposure location includes non-residential worker exposure locations and non-residential child exposure locations.

(37) “Notification area” means the area of impact or the area within a distance of 1.5 kilometers of a source, whichever is greater.

(38) “Operating permit” means a General, Basic, Simple or Standard Air Contaminant Discharge Permit under OAR chapter 340, division 216 or an Oregon Title V Operating Permit under OAR chapter 340, division 218.

(39) “Owner or operator” means any person who owns, leases, operates, controls, or supervises a stationary source.

(40) “Permit Denial Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which DEQ will not approve an operating permit for a new source, as provided in OAR 340-245-0100(5).

(41) “Pollution Prevention” means any practice that reduces, eliminates, or prevents pollution at its source, as described in OAR 340-245-0140.

(42) “Reconstructed,” as defined in Oregon Laws 2018, chapter 102, section 2, means an individual project is constructed at an air contamination source that, once constructed, increases the hourly capacity of any changed equipment to emit and where the fixed capital cost of new components exceeds 50 percent of the fixed capital cost that would have been required to construct a comparable new source.

(43) “Residential exposure location” means an exposure location outside the boundary of a source where people may reasonably be present for most hours of each day over a period of many years, including individual houses and areas that are zoned to allow residential use either exclusively or in conjunction with other uses.

(44) “Risk” means the chance of harmful effects to human health resulting from exposure to a toxic air contaminant emitted from a TEU or an entire source under an applicable exposure scenario. For the purpose of these rules, risk includes three types of risk: excess cancer risk, chronic noncancer risk, and acute noncancer risk.

(45) “Risk Action Level” as identified under OAR 340-245-8010 Table 1, means the levels of risk posed by a source or a TEU at which particular requirements of these rules will apply, or the owner or operator will be required to take specific action, depending on the risk posed to the area of impact as described in these rules.

(46) “Risk assessment” means a procedure that identifies toxic air contaminant emissions from a source or a TEU and calculates the risk from those emissions. This term specifically refers to the procedures under OAR 340-245-0050(8) through (11) and may include the results of air monitoring as allowed under OAR 340-245-0050(1)(c)(B). The procedures are designated Level 1 through Level 4, respectively, with complexity of a risk assessment increasing as the level numeration increases, (i.e., a Level 1 Risk Assessment is the simplest and a Level 4 Risk Assessment is the most complex).

(47) “Risk Determination Ratio” means the calculated value used to determine compliance with noncancer Risk Action Levels for existing sources as determined under OAR 340-245-0200.

(~~47~~48) "Risk limit" means a condition or requirement in a permit or permit addendum that serves to limit the risk from a source or part of a source. Such conditions or requirements may include, but are not restricted to, limits on risk from the source or part of a source, limits on emissions of one or more toxic air contaminants, limits on emissions from one or more TEUs, or limits on source operation. A Source Risk Limit established under OAR 340-245-0110 is a risk limit.

(~~48~~49) "Risk-Based Concentration" or "RBC" means the concentration of a toxic air contaminant listed in OAR 340-245-8040 Table 4 that, for the designated exposure scenario, results in an excess cancer risk of one in one million, or a noncancer hazard quotient of one for either chronic exposure or acute daily exposure.

(~~49~~50) "Risk Reduction Level" means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which the owner or operator of an existing source will be required to have an approved Risk Reduction Plan under OAR 340-245-0130.

(~~50~~51) "Sensitive Population" means people with biological traits that may magnify the harmful effects of toxic air contaminant exposures that include individuals undergoing rapid rates of physiological change, such as children, pregnant women and their fetuses, and individuals with impaired physiological conditions, such as elderly people with existing diseases such as heart disease or asthma. Other sensitive populations include those with lower levels of protective biological mechanisms due to genetic factors and those with increased exposure rates.

(~~51~~52) "Significant TEU" means a TEU that is not an exempt TEU and is not an aggregated TEU.

(~~52~~53) "Source Permit Level" means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, below which a source will be considered a de minimis source.

(~~53~~54) "Source risk" means the cumulative risk from all toxic air contaminants emitted by all significant TEUs at a source except that the source risk calculation for a de minimis source will include consideration of all of the source's TEUs, including both significant TEUs and aggregated TEUs.

(~~54~~55) "TBACT Level" means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, below which an existing source will be considered to be in compliance with these rules without having to further reduce its risk, and above which will require the owner or operator of the existing source either to demonstrate that its significant TEUs meet TBACT or to further reduce risk from the source, under OAR 340-245-0050(1)(c).

(~~55~~56) "TLAER Level" means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, below which a new or reconstructed source will be considered to be in compliance with these rules, and above which will require the owner or operator of the new or reconstructed source to demonstrate that its significant TEUs meet TLAER, under OAR 340-245-0050(2)(b).

(~~56~~57) "Toxic air contaminant" means an air pollutant that has been determined by the EQC to cause, or reasonably be anticipated to cause, adverse effects to human health and is listed in OAR 340-245-8020 Table 2.

(~~57~~58) "Toxic Air Contaminant Permit Addendum" means written authorization that incorporates the requirements under this division into a permit by amending an Air Contaminant Discharge Permit or a Title V Operating Permit, or in the case of a source assigned to a General Air Contaminant Discharge Permit, means written authorization imposing requirements under this division as additional source-specific permit conditions.

(~~58~~59) "Toxicity Reference Value" or "TRV" means the following:

(a) For carcinogens, the air concentration corresponding to a one in one million excess cancer risk, calculated by dividing one in one million (0.000001) by the inhalation unit risk specific to that toxic air contaminant as established by the authoritative body that establishes the value, and as approved by the EQC; and

(b) For noncarcinogens, the air concentration above which relevant effects might occur to humans following environmental exposure, and below which is reasonably expected that effects will not occur.

(~~59~~60) "Toxics Best Available Control Technology" or "TBACT" means a toxic air contaminant emission limitation or emission control measure or measures based on the maximum degree of reduction of toxic air contaminants that is feasible, determined using the procedures in OAR 340-245-0220.

(~~60~~61) "Toxics emissions unit" or "TEU" means an emissions unit or one or more individual emissions producing activities that emit or have the potential to emit any toxic air contaminant, as designated under OAR 340-245-0060.

(~~61~~62) "Toxics Lowest Achievable Emission Rate" or "TLAER" means that rate of emissions which reflects the most stringent emission limitation which is achieved in practice by a source in the same class or category of sources as the proposed source, determined using the procedures in OAR 340-245-0220.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3, 7 and 13
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015, 468A.035 & Or Laws 2018, ch. 102, §§ 2, 3, 6, 7 and 13
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0050
Risk Assessment Procedures

(1) Existing source.

(a) When notified in writing by DEQ, at DEQ's discretion, the owner or operator of an existing source with an operating permit must either demonstrate that it is an exempt source or:

(A) Assess risk from the source using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11);

(B) Assess risk from the source using the emissions inventory submitted under OAR 340-245-0040(1); and

(C) Follow the applicable calculation procedures under OAR 340-245-0200.

(b) If the owner or operator of an existing source proposes to modify the source in a way that would require compliance under OAR chapter 340, division 224, "New Source Review," excluding actions described in OAR 340-224-0010(2)(b) and (d)(B) that require compliance only as Type B State New Source Review, then the owner or operator must perform a risk assessment and demonstrate compliance under this division and must include its compliance demonstration under this division with its application submitted under OAR chapter 340, division 224.

(c) The owner or operator must demonstrate compliance with paragraph (A), (B), (C) or (D), and also comply with paragraph (E), if applicable.

(A) The owner or operator must demonstrate that the source is a de minimis source by following the procedure in section (7), or demonstrate that the risk from the source is less than or equal to the TBACT Level. The owner or operator of a source whose risk is less than or equal to the TBACT Level must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 with Source Risk Limits or an application that modifies the existing permit in a manner that ensures that the risk from the source will be less than or equal to the TBACT Level.

(B) Toxic air contaminant monitoring.

(i) Before the owner or operator of a source may begin air monitoring, the owner or operator must complete and submit to DEQ a Level 3 or Level 4 Risk Assessment and comply with the applicable requirements of OAR 340-245-0230.

~~(I) If the Level 3 or Level 4 Risk Assessment calculates risk from the source that exceeds an excess cancer risk of 200 in one million or a Hazard Index of 20, then the owner or operator may not delay submission of an application for a Toxics Air Contaminant Permit Addendum and subsequent implementation of the approved Risk Reduction Plan prepared under OAR 340-245-0130; and~~

(ii) An owner or operator may not delay submission of an application for an Air Contaminant Permit Addendum and subsequent implementation of the approved Risk Reduction Plan prepared under OAR 340-245-0130 if a Level 3 or 4 Risk Assessment shows that:

(I) Calculated cancer risk exceeds 200 in 1 million;

(II) Calculated noncancer risk exceeds a Hazard Index of 12 if all toxic air contaminants emitted have been assigned a noncancer TBACT Risk Action Level of a Hazard Index of 3;

(III) Calculated noncancer risk exceeds a Hazard Index of 20 if all toxic air contaminants emitted have been assigned a noncancer TBACT Risk Action Level of a Hazard Index of 5; or

(IV) Calculated noncancer Risk Determination Ratio exceeds 4 if air toxic contaminants emitted include a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5.

~~(II)~~ (iii) If the Level 3 or Level 4 Risk Assessment calculates risk from the source that does not ~~exceed an excess cancer risk of 200 in one million or a Hazard Index of 20,~~cause any exceedances of the criteria in subparagraph (ii), then DEQ shall issue a Toxics Air Contaminant Permit Addendum addressing only toxic air contaminant monitoring requirements, including a reporting and compliance schedule for implementing the Toxic Air Contaminant Monitoring Plan required under OAR 340-245-0230;

(~~ii~~iv) Upon completion and DEQ approval of toxic air contaminant monitoring in compliance with OAR 340-245-0230, the owner or operator must use the toxic air contaminant monitoring results, in association with other applicable, relevant data to determine compliance requirements under paragraph (c)(A), (C), or (D) and apply for a Toxic Air Contaminant Permit Addendum modification under OAR 340-245-0100;

(C) TBACT compliance. If the risk from the source is greater than the TBACT Level and less than or equal to the Risk Reduction Level, and all significant TEUs meet TBACT under OAR 340-245-0220, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes Source Risk Limits that ensure the risk from the source will be less than or equal to the Risk Reduction Level; or

(D) Risk Reduction Plan. The owner or operator may demonstrate compliance with this paragraph under either subparagraph (i), (ii), or (iii), whichever is applicable:

(i) If the risk from the source is greater than the TBACT Level and the owner or operator can make physical, operational or process changes to reduce the risk to less than or equal to the TBACT Level, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes a Risk Reduction Plan under OAR 340-245-0130 and Source Risk Limits that ensure that the risk from the source will be less than or equal to the TBACT Level;

(ii) If the risk from the source is greater than the TBACT Level and less than or equal to the Risk Reduction Level, but not all significant TEUs meet TBACT under OAR 340-245-0220, then the owner or operator must either reduce risk below the TBACT Level under subparagraph (i) or apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes a Risk Reduction Plan under OAR 340-245-0130 to meet TBACT on all significant TEUs and Source Risk Limits that ensure that the risk from the source will be less than or equal to the Risk Reduction Level; or

(iii) If the risk from the source is greater than the Risk Reduction Level, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes a Risk Reduction Plan under OAR 340-245-0130 with additional risk reduction measures and Source Risk Limits that ensure that the risk from the source will be less than or equal to the Risk Reduction Level;

(E) If the risk from the source is greater than the Immediate Curtailment Level, then the owner or operator must take immediate action to reduce risk to below the Immediate Curtailment Level.

(2) New or reconstructed source.

(a)(A) The owner or operator of a proposed new or reconstructed source that is required to obtain a Simple or Standard Air Contaminant Discharge Permit, and that is not an exempt source, must also perform a risk assessment, and if applicable, apply for a Toxic Air Contaminant Permit Addendum concurrently with an application for a permit under OAR chapter 340, division 216, before a permit is issued. If DEQ approves the applications, then DEQ will incorporate the toxic air contaminant permit conditions directly into the new Simple or Standard Air Contaminant Discharge Permit and will not issue a separate Toxic Air Contaminant Permit Addendum.

(B) DEQ may require the owner or operator of a proposed new or reconstructed source that is required to obtain a Basic or a General Air Contaminant Discharge Permit to perform a risk assessment and demonstrate compliance with this division, and if applicable, apply for a Toxic Air Contaminant Permit Addendum concurrently with an application for a permit under OAR chapter 340, division 216.

(i) If DEQ approves the applications for a source that will have a Basic Air Contaminant Discharge Permit, then DEQ will incorporate the toxic air contaminant permit conditions directly into the new operating permit.

(ii) If DEQ approves the applications for a source that will be assigned to a General Air Contaminant Discharge Permit, then DEQ will issue a Toxic Air Contaminant Permit Addendum as a source-specific addendum to the new operating permit that will not be incorporated into the operating permit.

(C) Any owner or operator of a proposed new or reconstructed source that is required to perform a risk assessment must:

(i) Assess risk from the source using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11);

(ii) Assess risk from the source using the emissions inventory submitted under OAR 340-245-0040(1); and

(iii) Follow the applicable calculation procedures under OAR 340-245-0200.

(b) The owner or operator of a new or reconstructed source must demonstrate compliance with either paragraph (A) or (B).

(A) The owner or operator must demonstrate that the source is a de minimis source by following the procedure in section (7), or demonstrate that the risk from the source is less than or equal to the TLAER Level. The owner or operator of a source whose risk is less than or equal to the TLAER Level must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 or an operating permit with Source Risk Limits that ensure that the risk from the source will be less than or equal to the TLAER Level; or

(B) TLAER compliance. If the risk from the new or reconstructed source is greater than the TLAER Level and less than or equal to the Permit Denial Level, and all significant TEUs meet TLAER under OAR 340-245-0220, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 or an operating permit that includes

Source Risk Limits that ensure the risk from the source will be less than or equal to the Permit Denial Level.

(3) Other sources. When notified in writing by DEQ, the owner or operator of a source that is not subject to sections (1) or (2) must perform a risk assessment using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11). DEQ may notify such a source after determining through an investigation or file review that the source may emit toxic air contaminants in quantities that may cause the source's risk to exceed the Source Permit Level.

(4) A risk assessment for a source must include all TEUs at the source, as of the date that the owner or operator submits an application under OAR 340-245-0100 for a Toxic Air Contaminant Permit Addendum, except for the following:

(a) Exempt TEUs;

(b) Gas combustion TEUs, as provided under section (5); and

(c) Aggregated TEUs, except when the owner or operator is requesting approval as a de minimis source under section (7).

(5) Gas combustion exemption. This exemption applies to TEUs that solely combust natural gas, propane, liquefied petroleum gas, and, when approved by DEQ in response to a written request by an owner or operator, pretreated landfill gas and pretreated digester gas or biogas. Risk from toxic air contaminants emitted from such combustion must be calculated and reported in the risk assessment, but the risk from such toxic air contaminants may be treated as follows:

(a) At each exposure location, risk must be reported as two values:

(A) The risk from toxic air contaminants emitted from such combustion of natural gas, propane, liquefied petroleum gas, pretreated landfill gas and pretreated digester gas or biogas ; and

(B) The risk from all other toxic air contaminant emissions;

(b) At each exposure location, the risk from toxic air contaminants emitted solely from the combustion of natural gas, propane, liquefied petroleum gas, pretreated landfill gas and pretreated digester gas or biogas may be excluded from the total risk for the purpose of determining compliance with Risk Action Levels and may be omitted from any requirements determined under a Risk Reduction Plan under OAR 340-245-0130 if good air pollution control practices are followed; and

(c) Notwithstanding subsections (a) and (b), an owner or operator must include in its risk assessment any toxic air contaminants that are emitted from materials that are contacted by the flame or combustion gases from the combustion of natural gas, propane, liquefied petroleum gas, pretreated landfill gas or pretreated digester gas or biogas. Materials that may emit toxic air contaminants include but are not limited to VOCs combusted in thermal oxidizers and materials dried in direct-contact dryers.

(6) Exempt Source Determination.

(a) To be approved as an exempt source, no later than 30 days after the date that DEQ sends a notice under subsection (1)(a) or with submittal of an application for a new or reconstructed source under subsection (2)(a), the owner or operator must submit information to DEQ that demonstrates that all TEUs at the source are exempt TEUs; and

(b) Upon receipt of a submittal from an owner or operator under subsection (a), DEQ will:

(A) Review the submissions and, if approved, write a memo to the DEQ file for the source summarizing the assessment that will be:

(i) Incorporated into the review report of a permitted source upon permit issuance or renewal; or

(ii) Maintained in the file and tracked in a DEQ database.

(B) Follow the Category I public notice procedure in OAR chapter 340, division 209, prior to approving or denying the request to be considered an exempt source; and

(C) Keep records of exempt sources in a database for the emissions inventory and future communication if RBCs change or other information about risk is received such that toxic air contaminant emissions must be reevaluated.

(7) De minimis Source Determination.

(a) To be approved as a de minimis source, the owner or operator must assess risk at the capacity of each TEU, including aggregated TEUs, using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11). The owner or operator must submit to DEQ the following:

(A) Information that demonstrates that the source does not exceed the Source Permit Level if the owner or operator is not required to operate and maintain control devices to remain a de minimis source;

(B) Information that demonstrates that the existing source does not exceed the Source Permit Level if the owner or operator is required to operate and maintain control devices to remain a de minimis source, and the existing operating permit includes necessary conditions to operate and maintain the control devices; or

(C) An application for a Toxic Air Contaminant Permit Addendum that demonstrates that the source does not exceed the Source Permit Level if the owner or operator is required to operate and maintain control devices to remain a de minimis source, and the source is a new source or the existing operating permit does not include necessary conditions to operate and maintain the control devices;

(b) Upon receipt of a submittal from an owner or operator under subsection (a), DEQ will:

(A) Review the submissions and, if approved, either:

(i) Write a memo to the DEQ file for the source summarizing the assessment that will be:

(I) Incorporated into the review report of a permitted source upon permit issuance or renewal; or

(II) Maintained in the file and tracked in a DEQ database for sources that meet the criteria in paragraph (a)(A) or (B); or

(ii) Issue a Toxic Air Contaminant Permit Addendum or operating permit, for sources that meet the criteria in paragraph (a)(C);

(B) Follow the Category I public notice procedure in OAR chapter 340, division 209, prior to approving or denying the request to be considered a de minimis source; and

(C) Keep records of de minimis sources in a database for the emissions inventory and future communication if RBCs change or other information about risk is received such that toxic air contaminant emissions must be reevaluated.

(8) Level 1 Risk Assessment. To complete a Level 1 Risk Assessment, the owner or operator must comply with OAR 340-245-0210(1) and then assess risk by using the Level 1 Risk Assessment Tool in OAR 340-245-8050 Table 5 to determine toxic air contaminant concentrations at approved exposure locations.

(a) The owner or operator must follow the directions for using the Level 1 Risk Assessment Tool described in OAR 340-245-0200(2);

(b) For sources with multiple stacks, stacks must either be considered individually using OAR 340-245-8050 Tables 5A and 5B with risk calculated as the summation of individual stack risk, or the stacks combined into a single stack in a manner approved by DEQ and risk calculated for that single stack;

(c) A Level 1 Risk Assessment will not be approved if the source is located near elevated terrain that DEQ determines could invalidate the assumptions used to develop the Level 1 Risk Assessment Tool; and

(d) If DEQ concludes that the source complies with this division based on a Level 1 Risk Assessment, then DEQ will follow the Category II public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(9) Level 2 Risk Assessment. To complete a Level 2 Risk Assessment, the owner or operator must comply with OAR 340-245-0210(1) and then assess risk by submitting a modeling protocol, conducting modeling, and performing a risk assessment. The owner or operator must use AERSCREEN or comparable screening model approved by DEQ to determine air concentrations at approved exposure locations. If DEQ concludes that the source complies with this division based on a Level 2 Risk Assessment, then DEQ will follow the Category II public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(10) Level 3 Risk Assessment. To complete a Level 3 Risk Assessment, the owner or operator must comply with OAR 340-245-0210 and then assess risk by submitting a modeling protocol and a risk assessment work plan, conducting modeling, and performing a risk assessment. The

owner or operator must use AERMOD or comparable model approved by DEQ to determine air concentrations at approved exposure locations. If DEQ concludes that the source complies with this division based on a Level 3 Risk Assessment, then DEQ will follow the Category III public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(11) Level 4 Risk Assessment. To complete a Level 4 Risk Assessment, the owner or operator must comply with OAR 340-245-0210 and then assess risk by submitting a modeling protocol and a risk assessment work plan, conducting modeling, and performing a risk assessment. The owner or operator must use AERMOD or comparable model approved by DEQ to determine air concentrations at approved exposure locations. The risk assessment must include toxicity and bioaccumulation assessments, and may include proposed modifications to default exposure assumptions as specified in OAR 340-245-0210. If DEQ concludes that the source complies with this division based on a Level 4 Risk Assessment, then DEQ will follow the Category III public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(12) DEQ may require the owner or operator of a source to conduct and submit an additional multipathway risk evaluation for any level of risk assessment if DEQ determines that airborne deposition of chemicals could be important for scenarios not included in the default multipathway adjustment factor assumptions used in the original risk assessment for the source.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3 and 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015, 468A.035 & Or Laws 2018, ch. 102, §§ 2, ~~and~~ 3, and 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0200
Risk Estimates

(1) When a risk assessment is required under this division, the risk assessment must consider the toxic air contaminants and the Risk-Based Concentrations listed in OAR 340-245-8040 Table 4 to assess excess cancer and noncancer risk.

(2) Directions for the Level 1 Risk Assessment Tool.

(a) An owner or operator that chooses to perform a Level 1 Risk Assessment under OAR 340-245-0050, must calculate a separate sum of risk ratios for each of the following categories: excess cancer risk, chronic noncancer risk, and acute noncancer risk for the applicable exposure locations;

(b) When making this calculation, the owner or operator must use the emissions inventory submitted under OAR 340-245-0040(1) for:

(A) Excess cancer risk and chronic noncancer risk, the average annual emission rates; and

(B) Acute noncancer risk, the maximum daily emission rates.

(c) The owner or operator must perform each of the following calculations in paragraphs (A) and (B), except as allowed in paragraph (C):

(A) For excess cancer risk and chronic noncancer risk:

(i) For each TEU, use the stack height and distance to the nearest exposure locations to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5A. If the TEU is a fugitive source, use the area and height of the building and distance to the nearest exposure locations to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5C;

(ii) For each TEU and each toxic air contaminant emitted from the TEU, multiply the annual emission rate by the dispersion factor identified under subparagraph (i) to calculate an air concentration at the nearest exposure location;

(iii) For each TEU, divide the air concentration of each toxic air contaminant calculated under subparagraph (ii) by the appropriate RBC of that toxic air contaminant under OAR 340-245-8040 Table 4;

(iv) For each TEU, add up the risk from each toxic air contaminant calculated under subparagraph (iii); and

(v) For all TEUs, add up all of the risks calculated under subparagraph (iv) to obtain the total excess cancer risk in one million or the total chronic noncancer Hazard Index for the entire source. For chronic noncancer risk, Hazard Indices may be calculated by noncancer target organ or organ systems in consultation with DEQ;

(vi) When an existing source emits a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5 as identified in OAR 340-245-8030, Table 3 and OAR 240-245-8040, Table 4, the owner or operator must calculate a Risk Determination Ratio using the formula in section (5) of this rule.

(B) For acute noncancer risk:

(i) For each TEU, use the stack height and distance to the nearest exposure location to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5B. If the TEU is a fugitive source, use the area and height of the building and distance to the nearest exposure locations to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5D;

(ii) For each TEU and each toxic air contaminant emitted from the TEU, multiply the maximum daily emission rate by the dispersion factor identified under subparagraph (i) to calculate an air concentration at the nearest exposure location;

(iii) For each TEU, divide the air concentration of each toxic air contaminant calculated under subparagraph (ii) by the acute RBC for that toxic air contaminant under OAR 340-245-8040 Table 4;

(iv) For each TEU, add up the risk from each toxic air contaminant calculated under subparagraph (iii); and

(v) For all TEUs, add up all of the risks calculated under subparagraph (iv) to obtain the total acute noncancer Hazard Index for the entire source. Hazard Indices may be calculated by noncancer target organ or organ systems in consultation with DEQ;

(vi) When an existing source emits a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5 as identified in OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4, the owner or operator must calculate a Risk Determination Ratio using the formula in section (5) of this rule.

(C) Instead of using stack height and distance or area and height of the building and distance to the nearest exposure locations to obtain the appropriate dispersion factor under OAR 340-245-8050 Table 5, the owner or operator may instead use, as a default, the most conservative dispersion factor;

(i) For stack emissions, use the dispersion factor associated with a stack height of five meters and an exposure location distance of 50 meters, which is listed in the upper-left corner of OAR 340-245-8050 Table 5A and B;

(ii) For fugitive emissions, use the dispersion factor associated with an area of less than or equal to 3,000 square feet, a building height of less than or equal to 20 feet, and an exposure location distance of 50 meters, which is listed in the upper-left corner of OAR 340-245-8050 Table 5C and D; and

(iii) Using these default dispersion factors will result in protective calculations of risk. If the risks calculated using these default dispersion factors are less than or equal to the applicable Risk Action Levels, the owner or operator may choose to use the risks calculated in this manner to show compliance with the Source Risk Limits.

(3) Sum of Risk Ratios calculation procedure for Level 2, Level 3 and Level 4 Risk Assessments.

(a) An owner or operator that chooses to perform a Level 2, Level 3 or Level 4 Risk Assessment under OAR 340-245-0050, must calculate a separate sum of risk ratio for each of the following risk categories: excess cancer risk, chronic noncancer risk, and acute noncancer risk for the applicable exposure locations;

(b) When making this calculation, the owner or operator must use the following modeled ambient concentrations for each toxic air contaminant at all exposure locations:

(A) For excess cancer risk and chronic noncancer risk, the annual average concentrations must be used; and

(B) For acute noncancer risk, the maximum daily concentrations must be used;

(c) The owner or operator must perform the following calculations for each of the risk categories listed in subsection (a) and using the concentrations in subsection (b):

(A) For each TEU, divide the modeled concentration of each toxic air contaminant by the appropriate RBC of that toxic air contaminant under OAR 340-245-8040 Table 4, ensuring that the concentration is expressed in micrograms per cubic meter;

(B) For each TEU, add up the risk from each toxic air contaminant calculated under paragraph (A); and

(C) For all TEUs at each exposure location, add up all of the risks calculated under paragraph (B) to obtain the total excess cancer risk in one million, the total chronic noncancer Hazard Index, or the total acute noncancer Hazard Index for the entire source. For noncancer risk, Hazard Indices may be calculated by noncancer target organ or organ systems in consultation with DEQ.

(D) When an existing source emits a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5 as identified in OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4, the owner or operator must calculate a Risk Determination Ratio using the formula in section (5) of this rule

(4) Significant figures and rounding. When a risk is calculated for comparison to a Risk Action Level or Source Risk Limit:

(a) The final risk calculation must be rounded off as follows:

(A) For comparison to the Aggregate TEU Level, Risk Determination Ratio, and the Source Permit Level, round off to one decimal place; and

(B) For comparison to other Risk Action Levels or Source Risk Limits, round off to a whole number;

(b) Round up if the last figure to be rounded off is 5 or greater, otherwise round down.

(c) Use of rounded numbers in making final risk calculations is not allowed. Only the final risk number may be rounded as described in this section.

(5) Calculating a Risk Determination Ratio. The formula for calculating a Risk Determination Ratio is:

Combined Noncancer Risk for HI3 chemicals =

(Concentration of HI3 chemical #1 / Risk-Based Concentration for chemical #1) + (Concentration of HI3 chemical #2 / Risk-Based Concentration for chemical #2) + continue for all HI3 chemicals emitted

Combined Noncancer Risk for HI5 chemicals =

(Concentration of HI5 chemical #1 / Risk-Based Concentration for chemical #1) + (Concentration of HI5 chemical #2 / Risk-Based Concentration for chemical #2) + continue for all HI5 chemicals emitted

Risk Determination Ratio = (Combined Risk for HI3 chemicals / 3) + (Combined Risk for HI5 chemicals / 5)

HI3 = Toxic air contaminants assigned noncancer TBACT Risk Action Level of 3 (OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4) .

HI5 = Toxic air contaminants assigned noncancer TBACT Risk Action Level of 5 (OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4) .

Concentration = monitored or modeled concentrations of toxic air contaminant at exposure location for use in risk assessment.

RBC = risk-based concentrations in OAR 340-245-8040 Table 4.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3 and 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015, 468A.035 & Or Laws 2018, ch. 102, §§ 2, ~~and~~ 3 and 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0320
Standards and Criteria for Noncancer Risk Action Levels for Existing Contamination Sources

(1) The noncancer Risk Action Levels for existing sources are identified in OAR 340-245-8010, Table 1.

(2) The toxic air contaminants for which an adjusted noncancer Risk Action Level will apply are identified in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4, in the column named "Noncancer TBACT RAL."

(3) An adjusted Risk Action Level will be applied to existing sources that emit one or more toxic air contaminants identified in OAR 340-245-8030, Table 3, or OAR 340-245-8040, Table 4, with a noncancer TBACT RAL of a Hazard Index of 3. For sources that emit a mixture of toxic air contaminants with noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5, the Risk Determination Ratio calculation expresses the degree to which the applicable Risk Action Level may be adjusted for each source.

Statutory/Other Authority: ORS 468.020 & Or Laws 2018, ch. 102, § 7.
Statutes/Other Implemented: Or Laws 2018, ch. 102, §7.
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-8010
Table 1 - Risk Action Levels

Table 1 - Risk Action Levels

[ED. NOTE: To view tables referenced in rule text, click here to view rule.]

OAR 340-245-8010
Table 1
Risk Action Levels†

Applicability	Risk Action Level	Excess Cancer Risk per Million	Noncancer Hazard Index
New and Reconstructed Source	Aggregate TEU Level	0.5	0.1
	Source Permit Level	0.5	0.5
	Community Engagement Level	5	1
	TLAER Level	10	1
	Permit Denial Level	25	1
Existing Source	Aggregate TEU Level	2.5	0.1
	Source Permit Level	5	0.5
	Community Engagement Level	25	1
	TBACT Level	50	5[a] ~~a~~ or 3[b] or Risk Determination Ratio of> 1.0[c].
	Risk Reduction Level	200	10[a] or 6[b] or Risk Determination Ratio of 2.0[c].
	Immediate Curtailment Level	500	20[a] or 12[b] or Risk Determination Ratio of 4.0[c]

Footnotes for OAR 340-245-8010 Table 1:

†Facility risk that is equal to or less than the values in the table is considered compliant with the Risk Action Level. Risk Action Levels are considered consistent with benchmarks in Oregon Laws 2018, chapter 102 (Senate Bill (SB) 1541 (2018)).

a If all toxic air contaminants emitted by the source are identified as HI5 in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4.

b If all toxic air contaminants emitted by the source are identified as HI3 in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4.

c If toxic air contaminants emitted by the source include contaminants listed as both HI3 and HI5 in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4, and a Risk Determination Ratio is required to be calculated under OAR 340-245-0200.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070 & 468A.155 and Or Laws 2018, ch. 102, § 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015 & 468A.035 and Or Laws 2018, ch. 102, § 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-8030
Table 3 - Toxicity Reference Values

Table 3 - Toxicity Reference Values

[ED. NOTE: To view tables referenced in rule text, click here to view rule.]

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
75-07-0	Acetaldehyde		HI3	0.45	A	140	O	470	O
60-35-5	Acetamide			0.050	O				
67-64-1	Acetone		HI3			31,000	T	62,000	S
75-05-8	Acetonitrile		HI3			60	I		
107-02-8	Acrolein		HI5			0.35	A	6.9	T
79-06-1	Acrylamide		HI3	0.010	I	6.0	I		
79-10-7	Acrylic acid		HI3			1.0	I	6,000	O
107-13-1	Acrylonitrile		HI3	0.015	A	5.0	O	220	T
309-00-2	Aldrin			0.00020	I				
107-05-1	Allyl chloride		HI3	0.17	O	1.0	I		

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
7429-90-5	Aluminum and compounds	O	HI5			5.0	P		
7664-41-7	Ammonia		HI3			500	A	1,200	T
62-53-3	Aniline		HI5	0.63	O	1.0	I		
7440-36-0	Antimony and compounds	o	HI3			0.30	T	1.0	T
140-57-8	Aramite			0.14	I				
7440-38-2	Arsenic and compounds	o	HI3	0.00023	A	0.015	O	0.20	S
7784-42-1	Arsine		HI3			0.015	O	0.20	O
1332-21-4	Asbestos	k		4.3E-06	I				
103-33-3	Azobenzene			0.032	I				
71-43-2	Benzene	j	HI3	0.13	A	3.0	O	29	T
92-87-5	Benzidine (and its salts)			7.1E-06	O				
100-44-7	Benzyl chloride		HI3	0.020	O	1.0	P	240	O
7440-41-7	Beryllium and compounds	o	HI3	0.00042	A	0.0070	O	0.020	S

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
111-44-4	*Bis*(2-chloroethyl) ether (BD~~D~~CEE)		HI3	0.0014	O			120	Tint
542-88-1	*Bis*(chloromethyl) ether		HI5	7.7E-05	O			1.4	Tint
117-81-7	*Bis*(2-ethylhexyl) phthalate (DEHP)			0.42	O				
75-25-2	Bromoform			0.91	I				
74-83-9	Bromomethane (Methyl bromide)		HI3			5.0	A	3,900	O
106-94-5	1-Bromopropane (*n*-propyl bromide)		HI3	0.48	A	33	T	1,700	T
106-99-0	1,3-Butadiene		HI3	0.033	A	2.0	O	660	O
78-93-3	2-Butanone (Methyl ethyl ketone)		HI3			5,000	I	5,000	S
78-92-2	*sec*-Butyl alcohol		HI3			30,000	P		
7440-43-9	Cadmium and compounds	o	HI3	0.00056	A	0.010	T	0.030	S
105-60-2	Caprolactam		HI3			2.2	O	50	O
75-15-0	Carbon disulfide		HI3			800	A	6,200	O
56-23-5	Carbon tetrachloride		HI3	0.17	A	100	I	1,900	O

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
463-58-1	Carbonyl sulfide		HI3			10	O	660	O
57-74-9	Chlordane	j	HI3	0.010	I	0.020	T	0.20	Tint
108171-26-2	Chlorinated paraffins	n		0.040	O				
7782-50-5	Chlorine		HI3			0.15	A	170	T
10049-04-4	Chlorine dioxide		HI3			0.60	O	2.8	Tint
532-27-4	2-Chloroacetophenone		HI5			0.030	I		
108-90-7	Chlorobenzene		HI3			50	P		
75-68-3	1-Chloro-1,1-difluoroethane		HI3			50,000	I		
75-45-6	Chlorodifluoromethane (Freon 22)		HI3			50,000	I		
75-00-3	Chloroethane (Ethyl chloride)		HI3			30,000	O	40,000	T
67-66-3	Chloroform		HI3		A2	300	A	490	T
74-87-3	Chloromethane (Methyl chloride)		HI3			90	A	1,000	T
95-83-0	4-Chloro-*o*-phenylenediamine			0.22	O				
76-06-2	Chloropicrin		HI3			0.40	O	29	O

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
126-99-8	Chloroprene		HI3	0.0033	I	20	I		
95-69-2	*p*-Chloro-*o*-toluidine			0.013	O				
18540-29-9	Chromium VI, chromate and dichromate particulate	d	HI3	8.3E-05	A	0.20	O	0.30	S
18540-29-9	Chromium VI, chromic acid aerosol mist	d	HI3	8.3E-05	A	0.0050	T	0.0050	S
7440-48-4	Cobalt and compounds	o	HI3		A2	0.10	A		
	Coke Oven Emissions			0.0016	I				
7440-50-8	Copper and compounds	o	HI3					100	O
120-71-8	*p*-Cresidine			0.023	O				
1319-77-3	Cresols (mixture), including *m*-cresol, *o*-cresol, *p*-cresol		HI3			600	O		
135-20-6	Cupferron			0.016	O				
74-90-8	Cyanide, Hydrogen		HI3			0.80	A	340	O
110-82-7	Cyclohexane		HI3			6,000	I		
50-29-3	DDT	e		0.010	I				
615-05-4	2,4-Diaminoanisole			0.15	O				

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
95-80-7	2,4-Diaminotoluene (2,4-Toluene diamine)			0.00091	O				
333-41-5	Diazinon		HI3					10	Tint
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)		HI3	0.00017	P	0.20	I	1.9	Tint
106-46-7	*p*-Dichlorobenzene (1,4-Dichlorobenzene)		HI3	0.091	A	60	T	12,000	T
91-94-1	3,3'-Dichlorobenzidine			0.0029	O				
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)			0.63	O				
156-60-5	*trans*-1,2-dichloroethene		HI3					790	T
75-09-2	Dichloromethane (Methylene chloride)		HI3	100	A	600	I	2,100	T
78-87-5	1,2-Dichloropropane (Propylene dichloride)		HI3			4.0	I	230	T
542-75-6	1,3-Dichloropropene		HI3	0.25	A	32	T	36	Tint
62-73-7	Dichlorovos (DDVP)		HI5			0.54	T	18	T
60-57-1	Dieldrin			0.00022	I				
	Diesel Particulate Matter		HI3	0.10	A	5.0	O		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
111-42-2	Diethanolamine		HI3			0.20	P		
112-34-5	Diethylene glycol monobutyl ether		HI3			0.10	P		
111-90-0	Diethylene glycol monoethyl ether		HI5			0.30	P		
75-37-6	1,1-Difluoroethane		HI5			40,000	I		
60-11-7	4-Dimethylaminoazobenzene			0.00077	O				
68-12-2	Dimethyl formamide		HI3			80	O		
57-14-7	1,1-Dimethylhydrazine		HI3					0.49	Tint
121-14-2	2,4-Dinitrotoluene			0.011	O				
123-91-1	1,4-Dioxane		HI3	0.20	I	30	I	7,200	T
122-66-7	1,2-Diphenylhydrazine (Hydrazobenzene)			0.0045	I				
1937-37-7	Direct Black 38			7.1E-06	O				
2602-46-2	Direct Blue 6			7.1E-06	O				
16071-86-6	Direct Brown 95 (technical grade)			7.1E-06	O				

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
298-04-4	Disulfoton		HI3					6.0	T
106-89-8	Epichlorohydrin		HI3	0.043	O	3.0	O	1,300	O
106-88-7	1,2-Epoxybutane		HI5			20	O		
140-88-5	Ethyl acrylate		HI3			8.0	P		
100-41-4	Ethyl benzene		HI3	0.40	A	260	T	22,000	T
106-93-4	Ethylene dibromide (EDB, 1,2-Dibromoethane)		HI3	0.0017	A	9.0	I		
107-06-2	Ethylene dichloride (EDC, 1,2-Dichloroethane)		HI3	0.038	A	7.0	P		
107-21-1	Ethylene glycol		HI3			400	O	2,000	T
111-76-2	Ethylene glycol monobutyl ether		HI3			82	O	29,000	T
110-80-5	Ethylene glycol monoethyl ether		HI3			70	O	370	O
111-15-9	Ethylene glycol monoethyl ether acetate		HI3			60	P	140	O
109-86-4	Ethylene glycol monomethyl ether		HI3			60	O	93	O
110-49-6	Ethylene glycol monomethyl ether acetate		HI3			1.0	P		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
75-21-8	Ethylene oxide		HI3	0.00033	A	30	O	160	Tint
96-45-7	Ethylene thiourea			0.077	O				
	Fluorides		HI3			13	A	240	O
7782-41-4	Fluorine gas		HI3					16	T
50-00-0	Formaldehyde		HI3	0.17	A	9.0	O	49	T
111-30-8	Glutaraldehyde		HI5			0.080	O	4.1	T
76-44-8	Heptachlor			0.00077	I				
1024-57-3	Heptachlor epoxide			0.00038	I				
118-74-1	Hexachlorobenzene			0.0020	O				
87-68-3	Hexachlorobutadiene			0.045	I				
608-73-1	Hexachlorocyclohexanes (mixture) including but not limited to:			0.00091	O				
319-84-6	Hexachlorocyclohexane, *alpha-*			0.00091	O				
319-85-7	Hexachlorocyclohexane, *beta-*			0.00091	O				

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
58-89-9	Hexachlorocyclohexane, *gamma*- (Lindane)			0.0032	O				
77-47-4	Hexachlorocyclopentadiene		HI3			0.20	I	110	Tint
67-72-1	Hexachloroethane		HI3			30	I	58,000	T
822-06-0	Hexamethylene-1,6-diisocyanate		HI5			0.069	T	0.21	Tint
110-54-3	Hexane		HI3			700	A		
302-01-2	Hydrazine		HI3	0.00020	O	0.030	P	5.2	Tint
7647-01-0	Hydrochloric acid		HI3			20	A	2,100	O
7664-39-3	Hydrogen fluoride		HI3			13	A	16	T
7783-06-4	Hydrogen sulfide		HI3			2.0	A	98	S
78-59-1	Isophorone		HI3			2,000	O		
67-63-0	Isopropyl alcohol		HI3			200	P	3,200	O
98-82-8	Isopropylbenzene (Cumene)		HI3			400	I		
7439-92-1	Lead and compounds	o	HI3		A2	0.15	A	0.15	S
108-31-6	Maleic anhydride		HI5			0.70	O		

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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
7439-96-5	Manganese and compounds	o	HI3			0.090	A	0.30	S
7439-97-6	Mercury and compounds	o	HI3			0.30	A	0.60	O
67-56-1	Methanol		HI3			4,000	A	28,000	O
101-14-4	4,4'-Methylene *bis*(2-chloroaniline) (MOCA)			0.0023	O				
101-77-9	4,4'-Methylenedianiline (and its dichloride)		HI5	0.0022	O	20	O		
101-68-8	Methylene diphenyl diisocyanate (MDI)		HI3			0.080	O	12	O
108-10-1	Methyl isobutyl ketone (MIBK, Hexone)		HI3			3,000	I		
624-83-9	Methyl isocyanate		HI3			1.0	O		
80-62-6	Methyl methacrylate		HI5			700	I		
1634-04-4	Methyl *tert*-butyl ether		HI3	3.8	O	8,000	O	8,000	O
90-94-8	Michler's ketone			0.0040	O				
91-20-3	Naphthalene		HI3	0.029	A	3.7	T	200	S
	Nickel compounds, insoluble	f	HI3	0.0038	A	0.014	O	0.20	O

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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
	Nickel compounds, soluble	f	HI3		A2	0.014	A	0.20	O
7697-37-2	Nitric acid		HI5					86	O
98-95-3	Nitrobenzene		HI3	0.025	I	9.0	I		
79-46-9	2-Nitropropane		HI3			20	I		
924-16-3	*N*-Nitrosodi-*n*-butylamine			0.00032	O				
55-18-5	*N*-Nitrosodiethylamine			1.0E-04	O				
62-75-9	*N*-Nitrosodimethylamine			0.00022	O				
86-30-6	*N*-Nitrosodiphenylamine			0.38	O				
156-10-5	*p*-Nitrosodiphenylamine			0.16	O				
621-64-7	*N*-Nitrosodi-*n*-propylamine			0.00050	O				
10595-95-6	*N*-Nitrosomethylethylamine			0.00016	O				
59-89-2	*N*-Nitrosomorpholine			0.00053	O				

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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
100-75-4	*N*-Nitrosopiperidine			0.00037	O				
930-55-2	*N*-Nitrosopyrrolidine			0.0017	O				
8014-95-7	Oleum (fuming sulfuric acid)		HI3					120	O
56-38-2	Parathion		HI3					0.020	Tint
87-86-5	Pentachlorophenol			0.20	O				
108-95-2	Phenol		HI3			200	O	5,800	O
75-44-5	Phosgene		HI3			0.30	A	4.0	O
7803-51-2	Phosphine		HI3			0.80	A		
7664-38-2	Phosphoric acid		HI3			10	A		
12185-10-3	Phosphorus, white		HI3			9.0	A	20	T
85-44-9	Phthalic anhydride		HI3			20	O		
	Polybrominated diphenyl ethers (PBDEs)	g	HI3					6.0	Tint
1336-36-3	Polychlorinated biphenyls (PCBs)			0.010	A				
	Polychlorinated biphenyls (PCBs) TEQ	h	HI3	2.6E-08	A1	4.E-05	O		

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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
32598-13-3	PCB 77 [3,3',4,4'-tetrachlorobiphenyl]	h	HI3	0.00026	A1	0.40	O		
70362-50-4	PCB 81 [3,4,4',5-tetrachlorobiphenyl]	h	HI3	8.8E-05	A1	0.13	O		
32598-14-4	PCB 105 [2,3,3',4,4'-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
74472-37-0	PCB 114 [2,3,4,4',5-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
31508-00-6	PCB 118 [2,3',4,4',5-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
65510-44-3	PCB 123 [2,3',4,4',5'-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
57465-28-8	PCB 126 [3,3',4,4',5-pentachlorobiphenyl]	h	HI3	2.6E-07	A1	0.00040	O		
38380-08-4	PCB 156 [2,3,3',4,4',5-hexachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
69782-90-7	PCB 157 [2,3,3',4,4',5'-hexachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
52663-72-6	PCB 167 [2,3',4,4',5,5'-hexachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
32774-16-6	PCB 169 [3,3',4,4',5,5'-hexachlorobiphenyl]	h	HI3	8.8E-07	A1	0.0013	O		

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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
39635-31-9	PCB 189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
	Polychlorinated dibenzo-*p*-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ	h	HI3	2.6E-08	A1	4.0E-05	O		
1746-01-6	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)		HI3	2.6E-08	A	4.0E-05	O		
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin (PeCDD)	h	HI3	2.6E-08	A1	4.0E-05	O		
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	h	HI3	2.6E-07	A1	0.00040	O		
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	h	HI3	2.6E-07	A1	0.00040	O		
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin (HxCDD)	h	HI3	2.6E-07	A1	0.00040	O		
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin (HpCDD)	h	HI3	2.6E-06	A1	0.0040	O		

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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
3268-87-9	Octachlorodibenzo-*p*-dioxin (OCDD)	h	HI3	8.8E-05	A1	0.13	O		
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran (TcDF)	h	HI3	2.6E-07	A1	0.00040	O		
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	h	HI3	8.8E-07	A1	0.0013	O		
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	h	HI3	8.8E-08	A1	0.00013	O		
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	h	HI3	2.6E-06	A1	0.0040	O		
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	h	HI3	2.6E-06	A1	0.0040	O		
39001-02-0	Octachlorodibenzofuran (OCDF)	h	HI3	8.8E-05	A1	0.13	O		
	Polycyclic aromatic hydrocarbons (PAHs)			0.0017	A				
191-26-4	Anthanthrene	i		0.0042	A1				
56-55-3	Benz[a]anthracene	i		0.0083	A1				
50-32-8	Benzo[a]pyrene	m	HI3	0.0017	A	0.0020	I	0.0020	I
205-99-2	Benzo[b]fluoranthene	i		0.0021	A1				
205-12-9	Benzo[c]fluorene	i		8.3E-05	A1				
191-24-2	Benzo[g,h,i]perylene	i		0.19	A1				
205-82-3	Benzo[j]fluoranthene	i		0.0056	A1				
207-08-9	Benzo[k]fluoranthene	i		0.056	A1				
218-01-9	Chrysene	i		0.017	A1				

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
27208-37-3	Cyclopenta[c,d]pyrene	i		0.0042	A1				
53-70-3	Dibenz[a,h]anthracene	i		0.00017	A1				
192-65-4	Dibenzo[a,e]pyrene	i		0.0042	A1				
189-64-0	Dibenzo[a,h]pyrene	i		0.0019	A1				
189-55-9	Dibenzo[a,i]pyrene	i		0.0028	A1				
191-30-0	Dibenzo[a,l]pyrene	i		5.6E-05	A1				
206-44-0	Fluoranthene	i		0.021	A1				
193-39-5	Indeno[1,2,3-cd]pyrene	i		0.024	A1				
3697-24-3	5-Methylchrysene	i		0.0017	A1				
7496-02-8	6-Nitrochrysene	i		0.00017	A1				
7758-01-2	Potassium bromate			0.0071	O				
1120-71-4	1,3-Propane sultone			0.0014	O				
123-38-6	Propionaldehyde		HI5			8.0	I		
115-07-1	Propylene		HI5			3,000	O		
6423-43-4	Propylene glycol dinitrate		HI5			0.27	T	20	T

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
107-98-2	Propylene glycol monomethyl ether		HI3			7,000	O		
75-56-9	Propylene oxide		HI3	0.27	O	30	O	3,100	O
	Refractory Ceramic Fibers	k	HI5			0.030	T		
7783-07-5	Selenide, hydrogen		HI3					5.0	O
7782-49-2	Selenium and compounds	j, o	HI3				A3	2.0	S
7631-86-9	Silica, crystalline (respirable)		HI5			3.0	O		
1310-73-2	Sodium hydroxide		HI3					8.0	O
100-42-5	Styrene		HI3			1,000	A	21,000	S
7664-93-9	Sulfuric acid		HI5			1.0	O	120	O
505-60-2	Sulfur Mustard		HI3					0.70	T
7446-71-9	Sulfur trioxide		HI5			1.0	O	120	O
630-20-6	1,1,1,2-Tetrachloroethane			0.14	I				
79-34-5	1,1,2,2-Tetrachloroethane			0.017	O				
127-18-4	Tetrachloroethene (Perchloroethylene)		HI3	3.8	A	41	T	41	T
811-97-2	1,1,1,2-Tetrafluoroethane		HI3			80,000	I		

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
62-55-5	Thioacetamide			0.00059	O				
7550-45-0	Titanium tetrachloride		HI3			0.10	T	10	Tint
108-88-3	Toluene		HI3			5,000	A	7,500	T
26471-62-5	Toluene diisocyanates (2,4- and 2,6-)		HI3	0.091	O	0.021	A	0.071	T
8001-35-2	Toxaphene (Polychlorinated camphenes)			0.0031	I				
71-55-6	1,1,1-Trichloroethane (Methyl chloroform)		HI3			5,000	A	11,000	T
79-00-5	1,1,2-Trichloroethane (Vinyl trichloride)			0.063	O				
79-01-6	Trichloroethene (TCE, Trichloroethylene)		HI3	0.24	A	2.1	T	2.1	Tint
88-06-2	2,4,6-Trichlorophenol			0.050	O				
96-18-4	1,2,3-Trichloropropane		HI5			0.30	I	1.8	T
121-44-8	Triethylamine		HI3			200	O	2,800	O
526-73-8	1,2,3-Trimethylbenzene		HI3			60	I		
95-63-6	1,2,4-Trimethylbenzene		HI3			60	I		

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
108-67-8	1,3,5-Trimethylbenzene		HI3			60	I		
51-79-6	Urethane (Ethyl carbamate)			0.0034	O				
7440-62-2	Vanadium (fume or dust)		HI3			0.10	T	0.80	T
1314-62-1	Vanadium pentoxide		HI3	0.00012	P	0.0070	P	30	O
108-05-4	Vinyl acetate	J	HI3			200	O	200	I
593-60-2	Vinyl bromide		HI5			3.0	I		
75-01-4	Vinyl chloride		HI3	0.11	I	100	I	1,300	T
75-35-4	Vinylidene chloride	J	HI3			200	I	200	I
1330-20-7	Xylene (mixture), including *m*-xylene, *o*-xylene, *p*-xylene		HI3			220	A	8,700	T

Notes:

a TRV based on a 1 in 1 million excess cancer risk.
TRV = $1x10^{-6}$ / IUR, where IUR = chemical-specific inhalation unit risk value [$(\mu g/m^3)^{-1}$].

b TRV based on chronic non-cancer value from authoritative sources ($\mu g/m^3$).

c TRV based on acute or subchronic non-cancer value from authoritative sources ($\mu g/m^3$).

d The TRVs presented for chromium are applicable to hexavalent chromium.

e DDT TRVs apply to the sum of DDT, DDE, and DDD compounds.

f As recommended by the ATSAC in 2018, the two categories of nickel compounds contain the following specific nickel compounds:

Soluble nickel compounds are considered to be emitted mainly in aerosol form, to be less potent carcinogens than insoluble nickel compounds, and include nickel acetate, nickel chloride, nickel carbonate, nickel hydroxide, nickelocene, nickel sulfate, nickel sulfate hexahydrate, nickel nitrate hexahydrate, nickel carbonate hydroxide.
Insoluble nickel compounds are considered to be emitted mainly in particulate form, to be more potent carcinogens than soluble nickel compounds, and to include nickel subsulfide, nickel oxide, nickel sulfide, nickel metal.

g TRVs apply to octabrominated diphenyl ethers (CAS# 32536-52-0) and pentabrominated diphenyl ethers (CAS# 32534-81-9), including BDE-99.

h TRV for chronic cancer calculated by applying toxicity equivalency factor to 2,3,7,8-TCDD TRV.

i TRV for chronic cancer calculated by applying toxicity equivalency factor to benzo[a]pyrene TRV.

j If the short-term toxicity reference value is lower than the chronic noncancer toxicity reference value, the chronic noncancer toxicity reference value was used for the short-term toxicity reference value because chronic noncancer toxicity reference values are generally more reliable.

k TRVs for asbestos and refractory ceramic fibers are in units of fibers/cm^3.

m Because benzo[a]pyrene can cause developmental effects, the chronic noncancer TRV is also used as the acute noncancer TRV.

n Chlorinated paraffins of average chain length of C12, approximately 60% chlorine by weight.

o An inorganic chemical designated with "and compounds" indicates that the TRV applies to the sum of all forms of the chemical, expressed as the inorganic element.

p. Noncancer TBACT RAL = noncancer Toxics Best Available Control Technology Risk Action Level, OAR 340-245-8010, Table 1.

Legend:

A = ATSAC, DEQ Air Toxics Science Advisory Committee, 2018.
A1 = ATSAC, 2018. TRV for cancer calculated by applying toxic equivalency factor.
A2 = Because the ATSAC decided it was inappropriate to develop an ABC based on carcinogenic effects, DEQ did not obtain a cancer TRV from the other authoritative sources.
A3 = Because the ATSAC decided it was inappropriate to develop an ABC based on noncarcinogenic effects, DEQ did not obtain a TRV from the other authoritative sources.
CAS# = Chemical Abstracts Service number
I = IRIS, EPA integrated risk information system
O = OEHHA, California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
P = PPRTV, EPA preliminary peer reviewed toxicity value
S = SGC, DEQ short-term guideline concentration
T = ATSDR, U.S. Agency for Toxic Substances and Disease Registry
TEQ = toxic equivalency, relative to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin.
Tint = ATSDR, intermediate minimal risk level
TRV = toxicity reference value

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070 & 468A.155 and Or Laws 2018, ch. 102, § 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015 & 468A.035 and Or Laws 2018, ch. 102, § 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-8040
Table 4 - Risk-Based Concentrations

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[ED. NOTE: To view tables referenced in rule text, click here to view rule.]

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Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
75-07-0	Acetaldehyde		HI3	0.45	140	12	620	5.5	620	470
60-35-5	Acetamide			0.050		1.3		0.60		
67-64-1	Acetone		HI3		31,000		140,000		140,000	62,000
75-05-8	Acetonitrile		HI3		60		260		260	
107-02-8	Acrolein		HI5		0.35		1.5		1.5	6.9
79-06-1	Acrylamide	g	HI3	0.0059	6.0	0.062	26	0.12	26	
79-10-7	Acrylic acid		HI3		1.0		4.4		4.4	6,000
107-13-1	Acrylonitrile		HI3	0.015	5.0	0.38	22	0.18	22	220
309-00-2	Aldrin			0.00020		0.0053		0.0024		
107-05-1	Allyl chloride		HI3	0.17	1.0	4.3	4.4	2.0	4.4	
7429-90-5	Aluminum and compounds	l	HI5		5.0		22		22	
7664-41-7	Ammonia		HI3		500		2,200		2,200	1,200
62-53-3	Aniline		HI5	0.63	1.0	16	4.4	7.5	4.4	
7440-36-0	Antimony and compounds	l	HI3		0.30		1.3		1.3	
140-57-8	Aramite			0.14		3.7		1.7		
7440-38-2	Arsenic and compounds	l	HI3	2.4E-05	0.00017	0.0013	0.0024	0.00062	0.0024	0.20
7784-42-1	Arsine		HI3		0.015		0.066		0.066	0.20
1332-21-4	Asbestos	I		4.3E-06		0.00011		5.2E-05		
103-33-3	Azobenzene			0.032		0.84		0.39		
71-43-2	Benzene		HI3	0.13	3.0	3.3	13	1.5	13	29

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Table 4
Risk-Based Concentrations

				Residential Chronic		Non-Residential Chronic				Acute
			Non cancer TBACTRAL [m]	Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
92-87-5	Benzidine (and its salts)	G		4.2E-06		4.4E-05		8.6E-05		
100-44-7	Benzyl chloride		HI3	0.020	1.0	0.53	4.4	0.24	4.4	240
7440-41-7	Beryllium and compounds	L	HI3	0.00042	0.0070	0.011	0.031	0.0050	0.031	0.020
111-44-4	*Bis*(2-chloroethyl) ether (BDCEE)		HI3	0.0014		0.037		0.017		120
542-88-1	*Bis*(chloromethyl) ether		HI5	7.7E-05		0.0020		0.00092		1.4
117-81-7	*Bis*(2-ethylhexyl) phthalate (DEHP)	C		0.080		11		5.0		
75-25-2	Bromoform			0.91		24		11		
74-83-9	Bromomethane (Methyl bromide)		HI3		5.0		22		22	3,900
106-94-5	1-Bromopropane (n-propyl bromide)		HI3	0.48	33	12	150	5.7	150	1,700
106-99-0	1,3-Butadiene		HI3	0.033	2.0	0.86	8.8	0.40	8.8	660
78-93-3	2-Butanone (Methyl ethyl ketone)		HI3		5,000		22,000		22,000	5,000
78-92-2	*sec*-Butyl alcohol		HI3		30,000		130,000		130,000	
7440-43-9	Cadmium and compounds	c, l	HI3	0.00056	0.0050	0.014	0.037	0.0067	0.037	0.030
105-60-2	Caprolactam		HI3		2.2		9.7		9.7	50
75-15-0	Carbon disulfide		HI3		800		3,500		3,500	6,200
56-23-5	Carbon tetrachloride		HI3	0.17	100	4.3	440	2.0	440	1,900
463-58-1	Carbonyl sulfide		HI3		10		44		44	660
57-74-9	Chlordane		HI3	0.010	0.020	0.26	0.088	0.12	0.088	0.20
108171-26-2	Chlorinated paraffins	j		0.040		1.0		0.48		
7782-50-5	Chlorine		HI3		0.15		0.66		0.66	170
10049-04-4	Chlorine dioxide		HI3		0.60		2.6		2.6	2.8
532-27-4	2-Chloroacetophenone		HI5		0.030		0.13		0.13	
108-90-7	Chlorobenzene		HI3		50		220		220	
75-68-3	1-Chloro-1,1-difluoroethane		HI3		50,000		220,000		220,000	

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Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
75-45-6	Chlorodifluoromethane (Freon 22)		HI3		50,000		220,000		220,000	
75-00-3	Chloroethane (Ethyl chloride)		HI3		30,000		130,000		130,000	40,000
67-66-3	Chloroform		HI3		300		1,300		1,300	490
74-87-3	Chloromethane (Methyl chloride)		HI3		90		400		400	1,000
95-83-0	4-Chloro-*o*-phenylenediamine			0.22		5.7		2.6		
76-06-2	Chloropicrin		HI3		0.40		1.8		1.8	29
126-99-8	Chloroprene		HI3	0.0033	20	0.087	88	0.040	88	
95-69-2	*p*-Chloro-*o*-toluidine			0.013		0.34		0.16		
18540-29-9	Chromium VI, chromate and dichromate particulate	c, d	HI3	3.1E-05	0.083	0.00052	0.88	0.0010	0.88	0.30
18540-29-9	Chromium VI, chromic acid aerosol mist	c, d	HI3	3.1E-05	0.0021	0.00052	0.022	0.0010	0.022	0.0050
7440-48-4	Cobalt and compounds	l	HI3		0.10		0.44		0.44	
	Coke Oven Emissions	g		0.00095		0.0100		0.019		
7440-50-8	Copper and compounds	l	HI3							100
120-71-8	*p*-Cresidine			0.023		0.60		0.28		
1319-77-3	Cresols (mixture), including *m*-cresol, *o*-cresol, *p*-cresol		HI3		600		2,600		2,600	
135-20-6	Cupferron			0.016		0.41		0.19		
74-90-8	Cyanide, Hydrogen		HI3		0.80		3.5		3.5	340
110-82-7	Cyclohexane		HI3		6,000		26,000		26,000	
50-29-3	DDT	e		0.010		0.27		0.12		
615-05-4	2,4-Diaminoanisole			0.15		3.9		1.8		
95-80-7	2,4-Diaminotoluene (2,4-Toluene diamine)			0.00091		0.024		0.011		
333-41-5	Diazinon		HI3							10
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	g	HI3	9.8E-05	0.20	0.0010	0.88	0.0020	0.88	1.9

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Table 4
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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
106-46-7	*p*-Dichlorobenzene (1,4-Dichlorobenzene)		HI3	0.091	60	2.4	260	1.1	260	12,000
91-94-1	3,3'-Dichlorobenzidine			0.0029		0.076		0.035		
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)			0.63		16		7.5		
156-60-5	*trans*-1,2-dichloroethene		HI3							790
75-09-2	Dichloromethane (Methylene chloride)		HI3	59	600	620	2,600	1,200	2,600	2,100
78-87-5	1,2-Dichloropropane (Propylene dichloride)		HI3		4.0		18		18	230
542-75-6	1,3-Dichloropropene		HI3	0.25	32	6.5	140	3.0	140	36
62-73-7	Dichlorovos (DDVP)		HI5		0.54		2.4		2.4	18
60-57-1	Dieldrin			0.00022		0.0057		0.0026		
	Diesel Particulate Matter		HI3	0.10	5.0	2.6	22	1.2	22	
111-42-2	Diethanolamine		HI3		0.20		0.88		0.88	
112-34-5	Diethylene glycol monobutyl ether		HI3		0.10		0.44		0.44	
111-90-0	Diethylene glycol monoethyl ether		HI5		0.30		1.3		1.3	
75-37-6	1,1-Difluoroethane		HI5		40,000		180,000		180,000	
60-11-7	4-Dimethylaminoazobenzene			0.00077		0.020		0.0092		
68-12-2	Dimethyl formamide		HI3		80		350		350	
57-14-7	1,1-Dimethylhydrazine		HI3							0.49
121-14-2	2,4-Dinitrotoluene			0.011		0.29		0.13		
123-91-1	1,4-Dioxane		HI3	0.20	30	5.2	130	2.4	130	7,200
122-66-7	1,2-Diphenylhydrazine (Hydrazobenzene)			0.0045		0.12		0.055		
1937-37-7	Direct Black 38			7.1E-06		0.00019		8.6E-05		
2602-46-2	Direct Blue 6			7.1E-06		0.00019		8.6E-05		
16071-86-6	Direct Brown 95 (technical grade)			7.1E-06		0.00019		8.6E-05		

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Table 4
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				Residential Chronic		Non-Residential Chronic				Acute
			Non cancer TBACTRAL [m]	Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
298-04-4	Disulfoton		HI3							6.0
106-89-8	Epichlorohydrin		HI3	0.043	3.0	1.1	13	0.52	13	1,300
106-88-7	1,2-Epoxybutane		HI5		20		88		88	
140-88-5	Ethyl acrylate		HI3		8.0		35		35	
100-41-4	Ethyl benzene		HI3	0.40	260	10	1,100	4.8	1,100	22,000
106-93-4	Ethylene dibromide (EDB, 1,2-Dibromoethane)		HI3	0.0017	9.0	0.043	40	0.020	40	
107-06-2	Ethylene dichloride (EDC, 1,2-Dichloroethane)		HI3	0.038	7.0	1.0	31	0.46	31	
107-21-1	Ethylene glycol		HI3		400		1,800		1,800	2,000
111-76-2	Ethylene glycol monobutyl ether		HI3		82		360		360	29,000
110-80-5	Ethylene glycol monoethyl ether		HI3		70		310		310	370
111-15-9	Ethylene glycol monoethyl ether acetate		HI3		60		260		260	140
109-86-4	Ethylene glycol monomethyl ether		HI3		60		260		260	93
110-49-6	Ethylene glycol monomethyl ether acetate		HI3		1.0		4.4		4.4	
75-21-8	Ethylene oxide	g	HI3	0.00020	30	0.0021	130	0.0040	130	160
96-45-7	Ethylene thiourea			0.077		2.0		0.92		
	Fluorides	c	HI3		2.3		20		20	240
7782-41-4	Fluorine gas		HI3							16
50-00-0	Formaldehyde		HI3	0.17	9.0	4.3	40	2.0	40	49
111-30-8	Glutaraldehyde		HI5		0.080		0.35		0.35	4.1
76-44-8	Heptachlor			0.00077		0.020		0.0092		
1024-57-3	Heptachlor epoxide			0.00038		0.010		0.0046		
118-74-1	Hexachlorobenzene			0.0020		0.051		0.024		
87-68-3	Hexachlorobutadiene			0.045		1.2		0.55		

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				Residential Chronic		Non-Residential Chronic				Acute
			Non cancer TBACTRAL [m]	Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
608-73-1	Hexachlorocyclohexanes (mixture) including but not limited to:	c		0.00017		0.018		0.0084		
319-84-6	Hexachlorocyclohexane, *alpha*-	c		0.00017		0.018		0.0084		
319-85-7	Hexachlorocyclohexane, *beta*-	c		0.00017		0.018		0.0084		
58-89-9	Hexachlorocyclohexane, *gamma*- (Lindane)	c		0.00060		0.065		0.030		
77-47-4	Hexachlorocyclopentadiene		HI3		0.20		0.88		0.88	110
67-72-1	Hexachloroethane		HI3		30		130		130	58,000
822-06-0	Hexamethylene-1,6-diisocyanate		HI5		0.069		0.30		0.30	0.21
110-54-3	Hexane		HI3		700		3,100		3,100	
302-01-2	Hydrazine		HI3	0.00020	0.030	0.0053	0.13	0.0024	0.13	5.2
7647-01-0	Hydrochloric acid		HI3		20		88		88	2,100
7664-39-3	Hydrogen fluoride	c	HI3		2.1		19		19	16
7783-06-4	Hydrogen sulfide		HI3		2.0		8.8		8.8	98
78-59-1	Isophorone		HI3		2,000		8,800		8,800	
67-63-0	Isopropyl alcohol		HI3		200		880		880	3,200
98-82-8	Isopropylbenzene (Cumene)		HI3		400		1,800		1,800	
7439-92-1	Lead and compounds	c, l	HI3		0.15		0.66		0.66	0.15
108-31-6	Maleic anhydride		HI5		0.70		3.1		3.1	
7439-96-5	Manganese and compounds	l	HI3		0.090		0.40		0.40	0.30
7439-97-6	Mercury and compounds	c, l	HI3		0.077		0.63		0.63	0.60
67-56-1	Methanol		HI3		4,000		18,000		18,000	28,000
101-14-4	4,4'-Methylene *bis*(2-chloroaniline) (MOCA)			0.0023		0.060		0.028		
101-77-9	4,4'-Methylenedianiline (and its dichloride)		HI5	0.00030	20	0.023	88	0.010	88	

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
101-68-8	Methylene diphenyl diisocyanate (MDI)		HI3		0.080		0.35		0.35	12
108-10-1	Methyl isobutyl ketone (MIBK, Hexone)		HI3		3,000		13,000		13,000	
624-83-9	Methyl isocyanate		HI3		1.0		4.4		4.4	
80-62-6	Methyl methacrylate		HI5		700		3,100		3,100	
1634-04-4	Methyl *tert*-butyl ether		HI3	3.8	8,000	100	35,000	46	35,000	8,000
90-94-8	Michler's ketone			0.0040		0.10		0.048		
91-20-3	Naphthalene	c	HI3	0.029	3.7	0.76	16	0.35	16	200
	Nickel compounds, insoluble	f	HI3	0.0038	0.014	0.10	0.062	0.046	0.062	0.20
	Nickel compounds, soluble	f	HI3		0.014		0.062		0.062	0.20
7697-37-2	Nitric acid		HI5							86
98-95-3	Nitrobenzene		HI3	0.025	9.0	0.65	40	0.30	40	
79-46-9	2-Nitropropane		HI3		20		88		88	
924-16-3	*N*-Nitrosodi-*n*-butylamine			0.00032		0.0084		0.0039		
55-18-5	*N*-Nitrosodiethylamine	g		5.9E-05		0.00062		0.0012		
62-75-9	*N*-Nitrosodimethylamine	g		0.00013		0.0013		0.0026		
86-30-6	*N*-Nitrosodiphenylamine			0.38		10		4.6		
156-10-5	*p*-Nitrosodiphenylamine			0.16		4.1		1.9		
621-64-7	*N*-Nitrosodi-*n*-propylamine			0.00050		0.013		0.0060		
10595-95-6	*N*-Nitrosomethylethylamine			0.00016		0.0041		0.0019		
59-89-2	*N*-Nitrosomorpholine			0.00053		0.014		0.0063		
100-75-4	*N*-Nitrosopiperidine			0.00037		0.0096		0.0044		
930-55-2	*N*-Nitrosopyrrolidine			0.0017		0.043		0.020		
8014-95-7	Oleum (fuming sulfuric acid)		HI3							120
56-38-2	Parathion		HI3							0.020
87-86-5	Pentachlorophenol			0.20		5.1		2.4		
108-95-2	Phenol		HI3		200		880		880	5,800

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
75-44-5	Phosgene		HI3		0.30		1.3		1.3	4.0
7803-51-2	Phosphine		HI3		0.80		3.5		3.5	
7664-38-2	Phosphoric acid		HI5		10		44		44	
12185-10-3	Phosphorus, white		HI3		9.0		40		40	20
85-44-9	Phthalic anhydride		HI3		20		88		88	
	Polybrominated diphenyl ethers (PBDEs)	h	HI3							6.0
1336-36-3	Polychlorinated biphenyls (PCBs)	c		0.00053		0.020		0.0092		
	Polychlorinated biphenyls (PCBs) TEQ	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
32598-13-3	PCB 77 [3,3',4,4'-tetrachlorobiphenyl]	c	HI3	1.0E-05	0.0013	0.00090	0.26	0.00042	0.26	
70362-50-4	PCB 81 [3,4,4',5-tetrachlorobiphenyl]	c	HI3	3.4E-06	0.00042	0.00030	0.085	0.00014	0.085	
32598-14-4	PCB 105 [2,3,3',4,4'-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
74472-37-0	PCB 114 [2,3,4,4',5-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
31508-00-6	PCB 118 [2,3',4,4',5-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
65510-44-3	PCB 123 [2,3',4,4',5'-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
57465-28-8	PCB 126 [3,3',4,4',5-pentachlorobiphenyl]	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
38380-08-4	PCB 156 [2,3,3',4,4',5-hexachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
69782-90-7	PCB 157 [2,3,3',4,4',5'-hexachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
52663-72-6	PCB 167 [2,3',4,4',5,5'-hexachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
32774-16-6	PCB 169 [3,3',4,4',5,5'-hexachlorobiphenyl]	c	HI3	3.4E-08	4.2E-06	3.0E-06	0.00085	1.4E-06	0.00085	

OAR 340-245-8040
Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
39635-31-9	PCB 189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]	c	HI3	0.00088	1.3	0.023	5.7	0.011	5.7	
	Polychlorinated dibenzo-*p*-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
1746-01-6	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin (PeCDD)	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin (HxCDD)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin (HpCDD)	c	HI3	1.0E-07	1.3E-05	9.0E-06	0.0026	4.2E-06	0.0026	
3268-87-9	Octachlorodibenzo-*p*-dioxin (OCDD)	c	HI3	3.4E-06	0.00042	0.00030	0.085	0.00014	0.085	
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran (TcDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	c	HI3	3.4E-08	4.2E-06	3.0E-06	0.00085	1.4E-06	0.00085	
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	c	HI3	3.4E-09	4.2E-07	3.0E-07	8.5E-05	1.4E-07	8.5E-05	
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	

OAR 340-245-8040
Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	c	HI3	1.0E-07	1.3E-05	9.0E-06	0.0026	4.2E-06	0.0026	
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	c	HI3	1.0E-07	1.3E-05	9.0E-06	0.0026	4.2E-06	0.0026	
39001-02-0	Octachlorodibenzofuran (OCDF)	c	HI3	3.4E-06	0.00042	0.00030	0.085	0.00014	0.085	
	Polycyclic aromatic hydrocarbons (PAHs)	c, g		4.3E-05		0.0016		0.0030		
191-26-4	Anthanthrene	c, g		0.00011		0.0039		0.0076		
56-55-3	Benz[a]anthracene	c, g		0.00021		0.0078		0.015		
50-32-8	Benzo[a]pyrene	c, g	HI3	4.3E-05	0.0020	0.0016	0.0088	0.0030	0.0088	0.0020
205-99-2	Benzo[b]fluoranthene	c, g		5.3E-05		0.0020		0.0038		
205-12-9	Benzo[c]fluorene	c, g		2.1E-06		7.8E-05		0.00015		
191-24-2	Benzo[g,h,i]perylene	c, g		0.0047		0.17		0.34		
205-82-3	Benzo[j]fluoranthene	c, g		0.00014		0.0052		0.010		
207-08-9	Benzo[k]fluoranthene	c, g		0.0014		0.052		0.10		
218-01-9	Chrysene	c, g		0.00043		0.016		0.030		
27208-37-3	Cyclopenta[c,d]pyrene	c, g		0.00011		0.0039		0.0076		
53-70-3	Dibenz[a,h]anthracene	c, g		4.3E-06		0.00016		0.00030		
192-65-4	Dibenzo[a,e]pyrene	c, g		0.00011		0.0039		0.0076		
189-64-0	Dibenzo[a,h]pyrene	c, g		4.7E-05		0.0017		0.0034		

OAR 340-245-8040
Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
189-55-9	Dibenzo[a,i]pyrene	c, g		7.1E-05		0.0026		0.0051		
191-30-0	Dibenzo[a,l]pyrene	c, g		1.4E-06		5.2E-05		0.00010		
206-44-0	Fluoranthene	c, g		0.00053		0.020		0.038		
193-39-5	Indeno[1,2,3-cd]pyrene	c, g		0.00061		0.022		0.043		
3697-24-3	5-Methylchrysene	c, g		4.3E-05		0.0016		0.0030		
7496-02-8	6-Nitrochrysene	c, g		4.3E-06		0.00016		0.00030		
7758-01-2	Potassium bromate			0.0071		0.19		0.086		
1120-71-4	1,3-Propane sultone			0.0014		0.038		0.017		
123-38-6	Propionaldehyde		HI5		8.0		35		35	
115-07-1	Propylene		HI5		3,000		13,000		13,000	
6423-43-4	Propylene glycol dinitrate		HI5		0.27		1.2		1.2	20
107-98-2	Propylene glycol monomethyl ether		HI3		7,000		31,000		31,000	
75-56-9	Propylene oxide		HI3	0.27	30	7.0	130	3.2	130	3,100
	Refractory Ceramic Fibers	i	HI5		0.030		0.13		0.13	
7783-07-5	Selenide, hydrogen		HI3							5.0
7782-49-2	Selenium and compounds	l	HI3							2.0
7631-86-9	Silica, crystalline (respirable)		HI5		3.0		13		13	
1310-73-2	Sodium hydroxide		HI3							8.0
100-42-5	Styrene		HI3		1,000		4,400		4,400	21,000
7664-93-9	Sulfuric acid		HI5		1.0		4.4		4.4	120
505-60-2	Sulfur Mustard		HI3							0.70
7446-71-9	Sulfur trioxide		HI5		1.0		4.4		4.4	120
630-20-6	1,1,1,2-Tetrachloroethane			0.14		3.5		1.6		
79-34-5	1,1,2,2-Tetrachloroethane			0.017		0.45		0.21		
127-18-4	Tetrachloroethene (Perchloroethylene)		HI3	3.8	41	100	180	46	180	41
811-97-2	1,1,1,2-Tetrafluoroethane		HI3		80,000		350,000		350,000	

OAR 340-245-8040
Table 4
Risk-Based Concentrations

				Residential Chronic		Non-Residential Chronic				Acute
			Non cancer TBACTRAL [m]	Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
62-55-5	Thioacetamide			0.00059		0.015		0.0071		
7550-45-0	Titanium tetrachloride		HI3		0.10		0.44		0.44	10
108-88-3	Toluene		HI3		5,000		22,000		22,000	7,500
26471-62-5	Toluene diisocyanates (2,4- and 2,6-)		HI3	0.091	0.021	2.4	0.092	1.1	0.092	0.071
8001-35-2	Toxaphene (Polychlorinated camphenes)			0.0031		0.081		0.038		
71-55-6	1,1,1-Trichloroethane (Methyl chloroform)		HI3		5,000		22,000		22,000	11,000
79-00-5	1,1,2-Trichloroethane (Vinyl trichloride)			0.063		1.6		0.75		
79-01-6	Trichloroethene (TCE, Trichloroethylene)	g	HI3	0.20	2.1	3.5	9.2	2.9	9.2	2.1
88-06-2	2,4,6-Trichlorophenol			0.050		1.3		0.60		
96-18-4	1,2,3-Trichloropropane		HI5		0.30		1.3		1.3	1.8
121-44-8	Triethylamine		HI3		200		880		880	2,800
526-73-8	1,2,3-Trimethylbenzene		HI3		60		260		260	
95-63-6	1,2,4-Trimethylbenzene		HI3		60		260		260	
108-67-8	1,3,5-Trimethylbenzene		HI3		60		260		260	
51-79-6	Urethane (Ethyl carbamate)	g		0.0020		0.021		0.041		
7440-62-2	Vanadium (fume or dust)		HI3		0.10		0.44		0.44	0.80
1314-62-1	Vanadium pentoxide		HI3	0.00012	0.0070	0.0031	0.031	0.0014	0.031	30
108-05-4	Vinyl acetate		HI3		200		880		880	200
593-60-2	Vinyl bromide		HI5		3.0		13		13	
75-01-4	Vinyl chloride	g, k	HI3	0.11	100	0.22	440	2.7	440	1,300
75-35-4	Vinylidene chloride		HI3		200		880		880	200
1330-20-7	Xylene (mixture), including *m*-xylene, *o*-xylene, *p*-xylene		HI3		220		970		970	8,700

Notes:

a RBC = Risk-Based Concentration

b CAS# = Chemical Abstracts Service number

c Chronic RBCs include factors for multipathway risk.

d The RBCs presented for chromium are applicable to hexavalent chromium. In the absence of data indicating otherwise, assume that any total chromium (i.e., unspeciated) that is measured or modeled is entirely in the hexavalent form. Determine, based on information about the source of emissions, whether hexavalent chromium is emitted in aerosol or particulate form, and apply the corresponding RBC. Because there are no RBCs for trivalent chromium, a source determined to be emitting only trivalent chromium cannot be shown to pose an unacceptable risk, so the risk in this case will be considered acceptable.

e DDT RBCs apply to the sum of DDT, DDE, and DDD compounds.

f As recommended by DEQ's Air Toxics Science Advisory Committee (ATSAC) in 2018, the two categories of nickel compounds contain the following specific nickel compounds:
Soluble nickel compounds are considered to be emitted mainly in aerosol form, to be less potent carcinogens than insoluble nickel compounds, and include nickel acetate, nickel chloride, nickel carbonate, nickel hydroxide, nickelocene, nickel sulfate, nickel sulfate hexahydrate, nickel nitrate hexahydrate, nickel carbonate hydroxide.
Insoluble nickel compounds are considered to be emitted mainly in particulate form, to be more potent carcinogens than soluble nickel compounds, and to include nickel subsulfide, nickel oxide, nickel sulfide, nickel metal.

g RBCs adjusted to protect early-life exposure to infants and children because chemical is carcinogenic by a mutagenic mode of action.

h RBCs apply to octabrominated diphenyl ethers (CAS# 32536-52-0) and pentabrominated diphenyl ethers (CAS# 32534-81-9), including BDE-99.

i RBCs for asbestos and refractory ceramic fibers are in units of fibers/cm^3.

j Chlorinated paraffins of average chain length of C12, approximately 60% chlorine by weight.

k DEQ followed the ATSAC recommendation to develop a vinyl chloride TRV that already includes early-life exposure.

l An inorganic chemical designated with "and compounds" indicates that the RBC applies to the sum of all forms of the chemical, expressed as the inorganic element.

m Noncancer TBACT RAL = noncancer Toxics Best Available Control Technology Risk Action Level, OAR 340-245-8010, Table 1.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070 & 468A.155 and Or Laws 2018, ch. 102, § 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015 & 468A.035 and Or Laws 2018, ch. 102, § 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

Division 245

CLEANER AIR OREGON

340-245-0005
Purpose and Overview

(1) This statement of purpose and overview is an aid to understanding the rules in OAR 340-245-0010 through 340-245-8050 that follow, and is not for the purpose of regulation or compliance.

(2) Purpose. The purpose of Oregon's risk-based toxic air contaminant permitting program, known as Cleaner Air Oregon, is to:

(a) Prioritize and protect the health and well-being of all Oregonians with a special focus on sensitive populations such as children;

(b) Analyze public health risk due to toxic air contaminant emissions from industrial and commercial sources based on verified science and data;

(c) Consider similar regulations in other states and jurisdictions and use a science-based, consistent and transparent process for communicating and addressing risks from industrial and commercial emissions of toxic air contaminants, provide regulatory predictability to businesses and the communities they are a part of; and

(d) Reduce exposure to industrial and commercial toxic air contaminant emissions while supporting an environment where businesses and communities can thrive.

(3) Overview.

(a) OAR 340-245-0010, Applicability and Jurisdiction, OAR 340-245-0020, Definitions, and OAR 340-245-0022, Abbreviations and Acronyms, describe which sources the risk-based toxic air contaminant permitting program applies to and specifies definitions, abbreviations and acronyms to be used in the program;

(b) OAR 340-245-0030, Submittal and Payment Deadlines, provides the deadlines by which owners or operators must submit risk assessment compliance information when required by DEQ under this division. That rule generally provides owners or operators more time to submit the more complex assessments;

(c) OAR 340-245-0040, Emissions Inventory, authorizes DEQ to require a source to submit an inventory of all of its toxic air contaminant emissions to be used in a risk assessment and to submit periodic emissions inventory updates;

(d) OAR 340-245-0050, Risk Assessment Procedures, includes requirements and procedures for the owners and operators of sources to undertake any of the four levels of risk assessment to

demonstrate compliance and determine what requirements apply. The first level of risk assessment is a conservative estimate that is likely to overestimate risk. As the levels progress from Level 1 to Level 4, the assessments become more complex but also provide increasingly more site-specific and refined risk estimates. An owner or operator can choose to start with any level of risk assessment;

(e) OAR 340-245-0060, Toxic Emissions Units, explains how TEUs are analyzed and regulated in the context of assessing and regulating risk from an entire source. This rule includes the criteria for a TEU to be designated exempt or aggregated because it poses very low risk and the requirements for approval of new and modified TEUs;

(f) OAR 340-245-0100, Toxic Air Contaminant Permit Addenda, includes the procedural requirements for obtaining a permit addendum or a new operating permit under these rules. A Toxic Air Contaminant Permit Addendum will amend the source's Air Contaminant Discharge Permit or Title V Operating Permit until the requirements in the addendum can be incorporated into the source's operating permit, but will remain separate for a source that has a General Air Contaminant Discharge Permit;

(g) OAR 340-245-0110, Source Risk Limits, explains how risk limits will be set in Toxic Air Contaminant Permit Addenda or in operating permits with conditions required under this division;

(h) OAR 340-245-0120, Community Engagement, contains requirements for community engagement meetings and other aspects of community engagement;

(i) OAR 340-245-0130, Risk Reduction Plan Requirements, specifies how an owner or operator of an existing source must develop a plan to reduce risk, if required to do so, because the source risk exceeds the TBACT Level or the Risk Reduction Level. Risk can be reduced using a variety of methods as long as they are enforceable as permit conditions and achieve the required level of risk reduction. Provisions for Voluntary Risk Reduction are included in this rule;

(j) OAR 340-245-0140, Pollution Prevention, explains how the owner or operator of a source must perform a pollution prevention analysis when required under OAR 340-245-0130;

(k) OAR 340-245-0150, Postponement of Risk Reduction, specifies how an owner or operator of a source may request postponement of risk reduction due to financial hardship;

(l) OAR 340-245-0200, Risk Estimates, explains how the owner or operator of a source must perform the calculations required in this division. This rule explains how calculations should be rounded to evaluate compliance with Source Risk Limits;

(m) OAR 340-245-0210, Modeling and Risk Assessment Work Plan Requirements, contains air quality modeling and work plan requirements for owners or operators of sources that are required to assess risk;

(n) OAR 340-245-0220, TBACT and TLAER Procedures, explains how the owner or operator of a source must perform, respectively, a Toxics Best Available Control Technology or Toxics Lowest Achievable Emission Rate analysis;

(o) OAR 340-245-0230, Toxic Air Contaminant Monitoring Requirements, allows an owner or operator of a source to perform air monitoring to determine actual concentrations of toxic air contaminants in the ambient air around a source;

(p) OAR 340-245-0300, 340-245-0310, and 340-245-0320, Toxicity Reference Values, Process for Updating Lists of Regulated Toxic Air Contaminants and Their Risk-Based Concentrations, and Standards and Criteria for Noncancer Risk Action Levels for Existing Sources, describe the list of authoritative sources that publish toxicity information that the EQC considers, upon the recommendation of DEQ, in consultation with OHA, to determine the RBCs,the process of how the RBCs may be updated, and assignment of hazard index values based on health effects.

(q) OAR 340-245-0400, Cleaner Air Oregon Fees, specifies the permitting fees that apply to sources subject to the rules in this division; and

(r) OAR 340-245-8000 through 340-245-8050, Tables, include the established Risk Action Levels, lists of the regulated toxic air contaminants, the values used to develop Risk-Based Concentrations and the Level 1 Risk Assessment Tool.

(4) The long-term goal of Cleaner Air Oregon is to achieve a 50% reduction in the number of existing sources posing either an excess cancer risk of more than 25 in a million or a Hazard Index of more than 1 by the year 2034.

(5) This program supplements requirements in OAR chapter 340, division 244, Oregon Federal Hazardous Air Pollutant Program, and division 246, Oregon State Air Toxics Program. This program includes four levels of risk assessment and allows sources to choose any level of assessment to assess risk.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3. 7 and 13
Statutes/Other Implemented: ORS 468.065, 468A.010, 468A.015, 468A.025, 468A.035, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 2, 3, 6, 7 and 13.
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0020
Definitions

The definitions in OAR 340-200-0020, 340-204-0010 and this rule apply to this division. If the same term is defined in this rule and OAR 340-200-0020 or 340-204-0010, the definition in this rule applies to this division.

(1) “ABEL” means a computer model developed by EPA that evaluates a corporation's or partnership's ability to afford compliance costs, cleanup costs or civil penalties. ABEL is available upon request from DEQ.

(2) “Actual toxic air contaminant emission rate” means:

(a) For an existing source, the toxic air contaminant emissions rate from the source’s actual production; or

(b) For a new or reconstructed source, the toxic air contaminant emissions rate from the reasonably anticipated actual production by the new or reconstructed source.

(3) “Acute” means evaluated over a 24-hour period or day.

(4) “Acute exposure location” means an exposure location outside the boundary of a source being modeled for daily average concentrations of a toxic air contaminant, and that is:

(a) A chronic exposure location; or

(b) A location where people may spend several hours of one day.

(5) “AERMOD” is the EPA approved steady-state air dispersion model, specified in 40 CFR part 51, Appendix W, "Guidelines on Air Quality Models (Revised)," that is the primary model used for the analysis of ambient concentrations for regulatory compliance. AERMOD uses a fully developed set of meteorological and terrain data. AERMOD stands for American Meteorological Society/Environmental Protection Agency Regulatory Model. AERMOD is available upon request from DEQ.

(6) “AERSCREEN” is the EPA approved screening dispersion model, specified in 40 CFR part 51, Appendix W, "Guidelines on Air Quality Models (Revised)," based on AERMOD. The model uses conservative screening meteorology to produce estimates of "worst-case" concentration estimates that are equal to or greater than the estimates produced by AERMOD. AERSCREEN stands for American Meteorological Society/Environmental Protection Agency Regulatory Screening Model. AERSCREEN is available upon request from DEQ.

(7) “Aggregate TEU Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, that aggregated TEUs may not exceed, based on a calculation of the cumulative risk of all aggregated TEUs.

(8) “Aggregated TEUs” means all of a source’s TEUs that are identified by an owner or operator with total cumulative risk less than the Aggregate TEU Level. A TEU that is identified as one of the aggregated TEUs is referred to in the singular as an aggregated TEU.

(9) “Area of impact” means the geographic area where risk is determined to be above the applicable Risk Action Level, and is determined by AERMOD or other comparable model approved by DEQ.

(10) “Chronic” means evaluated over a one-year period or longer.

(11) “Chronic exposure location” means an exposure location outside the boundary of a source being modeled for annual average concentrations of a toxic air contaminant, and can be either:

(a) A residential exposure location; or

(b) A non-residential exposure location.

(12) “Community Engagement Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which DEQ will conduct community engagement.

(13) “Construction permit” means a Construction Air Contaminant Discharge Permit issued under OAR chapter 340, division 216, or a Standard Air Contaminant Discharge Permit used for approval of Type 3 or 4 changes under OAR chapter 340, division 210.

(14) “De minimis source” means a source whose excess cancer risk, chronic noncancer risk and acute noncancer risk estimates are each less than or equal to the Source Permit Level in OAR 340-245-8010 Table 1 when calculated based on the source’s capacity, as determined under OAR 340-245-0050(7).

(15) “DEQ notice date” means the date that DEQ sends a notice to an owner or operator that a risk assessment is required.

(16) “Environmental Justice” means equal protection from environmental and health hazards, and meaningful public participation in decisions that affect the environment in which people live, work, learn, practice spirituality, and play. Environmental Justice communities include minority and low-income communities, tribal communities, and other communities traditionally underrepresented in the public process.

(17) “Excess cancer risk” means the probability of developing cancer resulting from exposure to toxic air contaminant emissions from a TEU or an entire source under an applicable exposure scenario, over and above the background rate of cancer. Excess cancer risk is expressed in terms of “X” in a million, and means that approximately “X” number of additional cases of cancer would be expected in a population of one million people subject to the applicable exposure scenario.

(18) “Exempt source” means a source at which all TEUs are exempt TEUs or a source that has no TEUs that emit toxic air contaminants, as determined under OAR 340-245-0050(6).

(19) “Exempt TEU” means a TEU that DEQ has determined is exempt under OAR 340-245-0060(3). An exempt TEU is not required to comply with any other requirements of this division, other than those applicable to qualify as an exempt TEU and OAR 340-245-0060(4)(c)(A).

(20) “Existing source” means a source that:

(a) Commenced construction before November 16, 2018; or

(b) Submitted all necessary applications to DEQ under OAR 340 divisions 210 or 216 before November 16, 2018, and all such applications were deemed complete by DEQ.

(21) “Existing TEU” means a TEU that is not a new or modified TEU.

(22) “Exposure location” means a location where people, including sensitive populations, actually live or normally congregate and will be exposed to a toxic air contaminant present in the air, and thus be the location of an air quality modeling receptor at which toxic air contaminant concentrations and risk are evaluated. Exposure locations are associated with exposure scenarios

and identified based on allowed land use zoning, except as allowed under OAR 340-245-0210(1)(a)(F) or when DEQ has sufficient information to determine that an area is being used in a manner contrary to its land use zoning.

(23) "Exposure scenario" means a set of assumptions about how a population is exposed to toxic air contaminants. Included in the assumptions are the type of people exposed (e.g., children or adults), and the frequency and duration of exposure associated with the scenario (e.g., residential or occupational use). Exposure scenarios are associated with exposure locations.

(24) "Fixed capital cost" means the capital needed to purchase and construct all the depreciable components of a source.

(25) "Hazard Index number" or "Hazard Index," as defined in Oregon Laws 2018, chapter 102, section 2, means a number equal to the sum of the hazard quotients attributable to toxic air contaminants that have noncancer effects on the same target organs or organ systems.

(26) "Hazard quotient," as defined in Oregon Laws 2018, chapter 102, section 2, means a calculated numerical value that is used to evaluate noncancer health risk from exposure to a single toxic air contaminant. The calculated numerical value is the ratio of the air concentration of a toxic air contaminant to the noncancer Risk-Based Concentration at which no serious adverse human health effects are expected to occur.

(27) "Immediate Curtailment Level" means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which an existing source will not be permitted to postpone risk reduction under OAR 340-245-0160.

(28) "INDIPAY" means a computer model developed by EPA that evaluates an individual's ability to afford compliance costs, cleanup costs or civil penalties. INDIPAY is available upon request from DEQ.

(29) "Inhalation Unit Risk" means the upper-bound lifetime excess cancer risk estimated to result from continuous exposure to a toxic air contaminant at a concentration of 1 $\mu g/m^3$ in air. The interpretation of inhalation unit risk would be as follows: if unit risk = 2×10^{-6} per $\mu g/m^3$, then two excess cancer cases (upper bound estimate) are expected to develop per one million people if exposed daily for 70 years to one microgram of the toxic air contaminant per cubic meter of air.

(30) "Multipathway" means consideration of exposure pathways in addition to inhalation of chemicals in air, such as incidental ingestion and dermal contact with toxic air contaminants migrating to soil and water.

(31) "MUNIPAY" means a computer model developed by EPA that evaluates a municipality's or regional utility's ability to afford compliance costs, cleanup costs or civil penalties. MUNIPAY is available upon request from DEQ.

(32) "New or modified TEU" means a TEU at an existing source where one of the following criteria is met:

(a) Approval to construct or operate under OAR 340-210-0205 through 340-210-0250 was not required for the TEU, and construction commenced on or after November 16, 2018;

(b) Approval to construct or operate under OAR 340-210-0205 through 340-210-0250 is or was required for the TEU, and the owner or operator submitted the application on or after November 16, 2018; or

(c) Approval to construct or operate under OAR 340-210-0205 through 340-210-0250 was required for the TEU, but the owner or operator did not obtain the approval as required, and construction commenced on or after the following, as applicable:

(A) For Type 1 changes under OAR 340-210-0225, 10 days before November 16, 2018;

(B) For Type 2 changes under OAR 340-210-0225, 60 days before November 16, 2018;

(C) For Type 3 changes under OAR 340-210-0225, 120 days before November 16, 2018; and

(D) For Type 4 changes under OAR 340-210-0225, 240 days before November 16, 2018;

(d) With respect to a modification to a TEU, approval to construct or operate refers to approval to construct or operate the modification.

(33) “New source” means a source that is not an existing source.

(34) “Noncancer risk” means the chance of noncancer harmful effects to human health resulting from exposure to toxic air contaminant emissions from a TEU or an entire source under an applicable exposure scenario. There are two types of noncancer risk, chronic and acute. Noncancer risk is expressed numerically using the Hazard Index. Below a Hazard Index of 1, adverse noncancer health effects are unlikely, and above a Hazard Index of 1, adverse noncancer health effects become more likely.

(35) “Nonresident” means people who regularly spend time at a location but do not reside there. This includes, but is not limited to, children attending schools and daycare facilities and adults at workplaces.

(36) “Nonresidential exposure location” means an exposure location outside the boundary of a source where people may reasonably be present for a few hours several days per week, possibly over a period of several years, and that is zoned for uses that do not allow residential use. A nonresidential exposure location includes non-residential worker exposure locations and non-residential child exposure locations.

(37) “Notification area” means the area of impact or the area within a distance of 1.5 kilometers of a source, whichever is greater.

(38) “Operating permit” means a General, Basic, Simple or Standard Air Contaminant Discharge Permit under OAR chapter 340, division 216 or an Oregon Title V Operating Permit under OAR chapter 340, division 218.

(39) “Owner or operator” means any person who owns, leases, operates, controls, or supervises a stationary source.

(40) “Permit Denial Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which DEQ will not approve an operating permit for a new source, as provided in OAR 340-245-0100(5).

(41) “Pollution Prevention” means any practice that reduces, eliminates, or prevents pollution at its source, as described in OAR 340-245-0140.

(42) “Reconstructed,” as defined in Oregon Laws 2018, chapter 102, section 2, means an individual project is constructed at an air contamination source that, once constructed, increases the hourly capacity of any changed equipment to emit and where the fixed capital cost of new components exceeds 50 percent of the fixed capital cost that would have been required to construct a comparable new source.

(43) “Residential exposure location” means an exposure location outside the boundary of a source where people may reasonably be present for most hours of each day over a period of many years, including individual houses and areas that are zoned to allow residential use either exclusively or in conjunction with other uses.

(44) “Risk” means the chance of harmful effects to human health resulting from exposure to a toxic air contaminant emitted from a TEU or an entire source under an applicable exposure scenario. For the purpose of these rules, risk includes three types of risk: excess cancer risk, chronic noncancer risk, and acute noncancer risk.

(45) “Risk Action Level” as identified under OAR 340-245-8010 Table 1, means the levels of risk posed by a source or a TEU at which particular requirements of these rules will apply, or the owner or operator will be required to take specific action, depending on the risk posed to the area of impact as described in these rules.

(46) “Risk assessment” means a procedure that identifies toxic air contaminant emissions from a source or a TEU and calculates the risk from those emissions. This term specifically refers to the procedures under OAR 340-245-0050(8) through (11) and may include the results of air monitoring as allowed under OAR 340-245-0050(1)(c)(B). The procedures are designated Level 1 through Level 4, respectively, with complexity of a risk assessment increasing as the level numeration increases, (i.e., a Level 1 Risk Assessment is the simplest and a Level 4 Risk Assessment is the most complex).

(47) “Risk Determination Ratio” means the calculated value used to determine compliance with noncancer Risk Action Levels for existing sources as determined under OAR 340-245-0200.

(48) “Risk limit” means a condition or requirement in a permit or permit addendum that serves to limit the risk from a source or part of a source. Such conditions or requirements may include, but are not restricted to, limits on risk from the source or part of a source, limits on emissions of one or more toxic air contaminants, limits on emissions from one or more TEUs, or limits on source operation. A Source Risk Limit established under OAR 340-245-0110 is a risk limit.

(49) “Risk-Based Concentration” or “RBC” means the concentration of a toxic air contaminant listed in OAR 340-245-8040 Table 4 that, for the designated exposure scenario, results in an excess cancer risk of one in one million, or a noncancer hazard quotient of one for either chronic exposure or acute daily exposure.

(50) “Risk Reduction Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, at which the owner or operator of an existing source will be required to have an approved Risk Reduction Plan under OAR 340-245-0130.

(51) “Sensitive Population” means people with biological traits that may magnify the harmful effects of toxic air contaminant exposures that include individuals undergoing rapid rates of physiological change, such as children, pregnant women and their fetuses, and individuals with impaired physiological conditions, such as elderly people with existing diseases such as heart disease or asthma. Other sensitive populations include those with lower levels of protective biological mechanisms due to genetic factors and those with increased exposure rates.

(52) “Significant TEU” means a TEU that is not an exempt TEU and is not an aggregated TEU.

(53) “Source Permit Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, below which a source will be considered a de minimis source.

(54) “Source risk” means the cumulative risk from all toxic air contaminants emitted by all significant TEUs at a source except that the source risk calculation for a de minimis source will include consideration of all of the source’s TEUs, including both significant TEUs and aggregated TEUs.

(55) “TBACT Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, below which an existing source will be considered to be in compliance with these rules without having to further reduce its risk, and above which will require the owner or operator of the existing source either to demonstrate that its significant TEUs meet TBACT or to further reduce risk from the source, under OAR 340-245-0050(1)(c).

(56) “TLAER Level” means the risk action levels, as identified under that name in OAR 340-245-8010 Table 1, below which a new or reconstructed source will be considered to be in compliance with these rules, and above which will require the owner or operator of the new or reconstructed source to demonstrate that its significant TEUs meet TLAER, under OAR 340-245-0050(2)(b).

(57) “Toxic air contaminant” means an air pollutant that has been determined by the EQC to cause, or reasonably be anticipated to cause, adverse effects to human health and is listed in OAR 340-245-8020 Table 2.

(58) “Toxic Air Contaminant Permit Addendum” means written authorization that incorporates the requirements under this division into a permit by amending an Air Contaminant Discharge Permit or a Title V Operating Permit, or in the case of a source assigned to a General Air Contaminant Discharge Permit, means written authorization imposing requirements under this division as additional source-specific permit conditions.

(59) "Toxicity Reference Value" or "TRV" means the following:

(a) For carcinogens, the air concentration corresponding to a one in one million excess cancer risk, calculated by dividing one in one million (0.000001) by the inhalation unit risk specific to that toxic air contaminant as established by the authoritative body that establishes the value, and as approved by the EQC; and

(b) For noncarcinogens, the air concentration above which relevant effects might occur to humans following environmental exposure, and below which is reasonably expected that effects will not occur.

(60) "Toxics Best Available Control Technology" or "TBACT" means a toxic air contaminant emission limitation or emission control measure or measures based on the maximum degree of reduction of toxic air contaminants that is feasible, determined using the procedures in OAR 340-245-0220.

(61) "Toxics emissions unit" or "TEU" means an emissions unit or one or more individual emissions producing activities that emit or have the potential to emit any toxic air contaminant, as designated under OAR 340-245-0060.

(62) "Toxics Lowest Achievable Emission Rate" or "TLAER" means that rate of emissions which reflects the most stringent emission limitation which is achieved in practice by a source in the same class or category of sources as the proposed source, determined using the procedures in OAR 340-245-0220.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3, 7 and 13
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015, 468A.035 & Or Laws 2018, ch. 102, §§ 2, 3, 6, 7 and 13
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0050
Risk Assessment Procedures

(1) Existing source.

(a) When notified in writing by DEQ, at DEQ's discretion, the owner or operator of an existing source with an operating permit must either demonstrate that it is an exempt source or:

(A) Assess risk from the source using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11);

(B) Assess risk from the source using the emissions inventory submitted under OAR 340-245-0040(1); and

(C) Follow the applicable calculation procedures under OAR 340-245-0200.

(b) If the owner or operator of an existing source proposes to modify the source in a way that would require compliance under OAR chapter 340, division 224, "New Source Review," excluding actions described in OAR 340-224-0010(2)(b) and (d)(B) that require compliance only as Type B State New Source Review, then the owner or operator must perform a risk assessment and demonstrate compliance under this division and must include its compliance demonstration under this division with its application submitted under OAR chapter 340, division 224.

(c) The owner or operator must demonstrate compliance with paragraph (A), (B), (C) or (D), and also comply with paragraph (E), if applicable.

(A) The owner or operator must demonstrate that the source is a de minimis source by following the procedure in section (7), or demonstrate that the risk from the source is less than or equal to the TBACT Level. The owner or operator of a source whose risk is less than or equal to the TBACT Level must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 with Source Risk Limits or an application that modifies the existing permit in a manner that ensures that the risk from the source will be less than or equal to the TBACT Level.

(B) Toxic air contaminant monitoring.

(i) Before the owner or operator of a source may begin air monitoring, the owner or operator must complete and submit to DEQ a Level 3 or Level 4 Risk Assessment and comply with the applicable requirements of OAR 340-245-0230.

(ii) An owner or operator may not delay submission of an application for an Air Contaminant Permit Addendum and subsequent implementation of the approved Risk Reduction Plan prepared under OAR 340-245-0130 if a Level 3 or 4 Risk Assessment shows that:

(I) Calculated cancer risk exceeds 200 in 1 million;

(II) Calculated noncancer risk exceeds a Hazard Index of 12 if all toxic air contaminants emitted have been assigned a noncancer TBACT Risk Action Level of a Hazard Index of 3;

(III) Calculated noncancer risk exceeds a Hazard Index of 20 if all toxic air contaminants emitted have been assigned a noncancer TBACT Risk Action Level of a Hazard Index of 5; or

(IV) Calculated noncancer Risk Determination Ratio exceeds 4 if air toxic contaminants emitted include a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5.

(iii) If the Level 3 or Level 4 Risk Assessment calculates risk from the source that does not cause any exceedances of the criteria in subparagraph (ii), then DEQ shall issue a Toxics Air Contaminant Permit Addendum addressing only toxic air contaminant monitoring requirements, including a reporting and compliance schedule for implementing the Toxic Air Contaminant Monitoring Plan required under OAR 340-245-0230;

(iv) Upon completion and DEQ approval of toxic air contaminant monitoring in compliance with OAR 340-245-0230, the owner or operator must use the toxic air contaminant monitoring results, in association with other applicable, relevant data to determine compliance requirements under

paragraph (c)(A), (C), or (D) and apply for a Toxic Air Contaminant Permit Addendum modification under OAR 340-245-0100;

(C) TBACT compliance. If the risk from the source is greater than the TBACT Level and less than or equal to the Risk Reduction Level, and all significant TEUs meet TBACT under OAR 340-245-0220, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes Source Risk Limits that ensure the risk from the source will be less than or equal to the Risk Reduction Level; or

(D) Risk Reduction Plan. The owner or operator may demonstrate compliance with this paragraph under either subparagraph (i), (ii), or (iii), whichever is applicable:

(i) If the risk from the source is greater than the TBACT Level and the owner or operator can make physical, operational or process changes to reduce the risk to less than or equal to the TBACT Level, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes a Risk Reduction Plan under OAR 340-245-0130 and Source Risk Limits that ensure that the risk from the source will be less than or equal to the TBACT Level;

(ii) If the risk from the source is greater than the TBACT Level and less than or equal to the Risk Reduction Level, but not all significant TEUs meet TBACT under OAR 340-245-0220, then the owner or operator must either reduce risk below the TBACT Level under subparagraph (i) or apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes a Risk Reduction Plan under OAR 340-245-0130 to meet TBACT on all significant TEUs and Source Risk Limits that ensure that the risk from the source will be less than or equal to the Risk Reduction Level; or

(iii) If the risk from the source is greater than the Risk Reduction Level, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 that includes a Risk Reduction Plan under OAR 340-245-0130 with additional risk reduction measures and Source Risk Limits that ensure that the risk from the source will be less than or equal to the Risk Reduction Level;

(E) If the risk from the source is greater than the Immediate Curtailment Level, then the owner or operator must take immediate action to reduce risk to below the Immediate Curtailment Level.

(2) New or reconstructed source.

(a)(A) The owner or operator of a proposed new or reconstructed source that is required to obtain a Simple or Standard Air Contaminant Discharge Permit, and that is not an exempt source, must also perform a risk assessment, and if applicable, apply for a Toxic Air Contaminant Permit Addendum concurrently with an application for a permit under OAR chapter 340, division 216, before a permit is issued. If DEQ approves the applications, then DEQ will incorporate the toxic air contaminant permit conditions directly into the new Simple or Standard Air Contaminant Discharge Permit and will not issue a separate Toxic Air Contaminant Permit Addendum.

(B) DEQ may require the owner or operator of a proposed new or reconstructed source that is required to obtain a Basic or a General Air Contaminant Discharge Permit to perform a risk

assessment and demonstrate compliance with this division, and if applicable, apply for a Toxic Air Contaminant Permit Addendum concurrently with an application for a permit under OAR chapter 340, division 216.

(i) If DEQ approves the applications for a source that will have a Basic Air Contaminant Discharge Permit, then DEQ will incorporate the toxic air contaminant permit conditions directly into the new operating permit.

(ii) If DEQ approves the applications for a source that will be assigned to a General Air Contaminant Discharge Permit, then DEQ will issue a Toxic Air Contaminant Permit Addendum as a source-specific addendum to the new operating permit that will not be incorporated into the operating permit.

(C) Any owner or operator of a proposed new or reconstructed source that is required to perform a risk assessment must:

(i) Assess risk from the source using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11);

(ii) Assess risk from the source using the emissions inventory submitted under OAR 340-245-0040(1); and

(iii) Follow the applicable calculation procedures under OAR 340-245-0200.

(b) The owner or operator of a new or reconstructed source must demonstrate compliance with either paragraph (A) or (B).

(A) The owner or operator must demonstrate that the source is a de minimis source by following the procedure in section (7), or demonstrate that the risk from the source is less than or equal to the TLAER Level. The owner or operator of a source whose risk is less than or equal to the TLAER Level must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 or an operating permit with Source Risk Limits that ensure that the risk from the source will be less than or equal to the TLAER Level; or

(B) TLAER compliance. If the risk from the new or reconstructed source is greater than the TLAER Level and less than or equal to the Permit Denial Level, and all significant TEUs meet TLAER under OAR 340-245-0220, then the owner or operator must apply for a Toxic Air Contaminant Permit Addendum under OAR 340-245-0100 or an operating permit that includes Source Risk Limits that ensure the risk from the source will be less than or equal to the Permit Denial Level.

(3) Other sources. When notified in writing by DEQ, the owner or operator of a source that is not subject to sections (1) or (2) must perform a risk assessment using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11). DEQ may notify such a source after determining through an investigation or file review that the source may emit toxic air contaminants in quantities that may cause the source's risk to exceed the Source Permit Level.

(4) A risk assessment for a source must include all TEUs at the source, as of the date that the owner or operator submits an application under OAR 340-245-0100 for a Toxic Air Contaminant Permit Addendum, except for the following:

(a) Exempt TEUs;

(b) Gas combustion TEUs, as provided under section (5); and

(c) Aggregated TEUs, except when the owner or operator is requesting approval as a de minimis source under section (7).

(5) Gas combustion exemption. This exemption applies to TEUs that solely combust natural gas, propane, liquefied petroleum gas, and, when approved by DEQ in response to a written request by an owner or operator, pretreated landfill gas and pretreated digester gas or biogas. Risk from toxic air contaminants emitted from such combustion must be calculated and reported in the risk assessment, but the risk from such toxic air contaminants may be treated as follows:

(a) At each exposure location, risk must be reported as two values:

(A) The risk from toxic air contaminants emitted from such combustion of natural gas, propane, liquefied petroleum gas, pretreated landfill gas and pretreated digester gas or biogas ; and

(B) The risk from all other toxic air contaminant emissions;

(b) At each exposure location, the risk from toxic air contaminants emitted solely from the combustion of natural gas, propane, liquefied petroleum gas, pretreated landfill gas and pretreated digester gas or biogas may be excluded from the total risk for the purpose of determining compliance with Risk Action Levels and may be omitted from any requirements determined under a Risk Reduction Plan under OAR 340-245-0130 if good air pollution control practices are followed; and

(c) Notwithstanding subsections (a) and (b), an owner or operator must include in its risk assessment any toxic air contaminants that are emitted from materials that are contacted by the flame or combustion gases from the combustion of natural gas, propane, liquefied petroleum gas, pretreated landfill gas or pretreated digester gas or biogas. Materials that may emit toxic air contaminants include but are not limited to VOCs combusted in thermal oxidizers and materials dried in direct-contact dryers.

(6) Exempt Source Determination.

(a) To be approved as an exempt source, no later than 30 days after the date that DEQ sends a notice under subsection (1)(a) or with submittal of an application for a new or reconstructed source under subsection (2)(a), the owner or operator must submit information to DEQ that demonstrates that all TEUs at the source are exempt TEUs; and

(b) Upon receipt of a submittal from an owner or operator under subsection (a), DEQ will:

(A) Review the submissions and, if approved, write a memo to the DEQ file for the source summarizing the assessment that will be:

(i) Incorporated into the review report of a permitted source upon permit issuance or renewal; or

(ii) Maintained in the file and tracked in a DEQ database.

(B) Follow the Category I public notice procedure in OAR chapter 340, division 209, prior to approving or denying the request to be considered an exempt source; and

(C) Keep records of exempt sources in a database for the emissions inventory and future communication if RBCs change or other information about risk is received such that toxic air contaminant emissions must be reevaluated.

(7) De minimis Source Determination.

(a) To be approved as a de minimis source, the owner or operator must assess risk at the capacity of each TEU, including aggregated TEUs, using any of the Level 1 through Level 4 Risk Assessment procedures in sections (8) through (11). The owner or operator must submit to DEQ the following:

(A) Information that demonstrates that the source does not exceed the Source Permit Level if the owner or operator is not required to operate and maintain control devices to remain a de minimis source;

(B) Information that demonstrates that the existing source does not exceed the Source Permit Level if the owner or operator is required to operate and maintain control devices to remain a de minimis source, and the existing operating permit includes necessary conditions to operate and maintain the control devices; or

(C) An application for a Toxic Air Contaminant Permit Addendum that demonstrates that the source does not exceed the Source Permit Level if the owner or operator is required to operate and maintain control devices to remain a de minimis source, and the source is a new source or the existing operating permit does not include necessary conditions to operate and maintain the control devices;

(b) Upon receipt of a submittal from an owner or operator under subsection (a), DEQ will:

(A) Review the submissions and, if approved, either:

(i) Write a memo to the DEQ file for the source summarizing the assessment that will be:

(I) Incorporated into the review report of a permitted source upon permit issuance or renewal; or

(II) Maintained in the file and tracked in a DEQ database for sources that meet the criteria in paragraph (a)(A) or (B); or

(ii) Issue a Toxic Air Contaminant Permit Addendum or operating permit, for sources that meet the criteria in paragraph (a)(C);

(B) Follow the Category I public notice procedure in OAR chapter 340, division 209, prior to approving or denying the request to be considered a de minimis source; and

(C) Keep records of de minimis sources in a database for the emissions inventory and future communication if RBCs change or other information about risk is received such that toxic air contaminant emissions must be reevaluated.

(8) Level 1 Risk Assessment. To complete a Level 1 Risk Assessment, the owner or operator must comply with OAR 340-245-0210(1) and then assess risk by using the Level 1 Risk Assessment Tool in OAR 340-245-8050 Table 5 to determine toxic air contaminant concentrations at approved exposure locations.

(a) The owner or operator must follow the directions for using the Level 1 Risk Assessment Tool described in OAR 340-245-0200(2);

(b) For sources with multiple stacks, stacks must either be considered individually using OAR 340-245-8050 Tables 5A and 5B with risk calculated as the summation of individual stack risk, or the stacks combined into a single stack in a manner approved by DEQ and risk calculated for that single stack;

(c) A Level 1 Risk Assessment will not be approved if the source is located near elevated terrain that DEQ determines could invalidate the assumptions used to develop the Level 1 Risk Assessment Tool; and

(d) If DEQ concludes that the source complies with this division based on a Level 1 Risk Assessment, then DEQ will follow the Category II public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(9) Level 2 Risk Assessment. To complete a Level 2 Risk Assessment, the owner or operator must comply with OAR 340-245-0210(1) and then assess risk by submitting a modeling protocol, conducting modeling, and performing a risk assessment. The owner or operator must use AERSCREEN or comparable screening model approved by DEQ to determine air concentrations at approved exposure locations. If DEQ concludes that the source complies with this division based on a Level 2 Risk Assessment, then DEQ will follow the Category II public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(10) Level 3 Risk Assessment. To complete a Level 3 Risk Assessment, the owner or operator must comply with OAR 340-245-0210 and then assess risk by submitting a modeling protocol and a risk assessment work plan, conducting modeling, and performing a risk assessment. The owner or operator must use AERMOD or comparable model approved by DEQ to determine air concentrations at approved exposure locations. If DEQ concludes that the source complies with this division based on a Level 3 Risk Assessment, then DEQ will follow the Category III public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(11) Level 4 Risk Assessment. To complete a Level 4 Risk Assessment, the owner or operator must comply with OAR 340-245-0210 and then assess risk by submitting a modeling protocol and a risk assessment work plan, conducting modeling, and performing a risk assessment. The owner or operator must use AERMOD or comparable model approved by DEQ to determine air concentrations at approved exposure locations. The risk assessment must include toxicity and bioaccumulation assessments, and may include proposed modifications to default exposure assumptions as specified in OAR 340-245-0210. If DEQ concludes that the source complies with this division based on a Level 4 Risk Assessment, then DEQ will follow the Category III public notice procedure in OAR chapter 340, division 209 for issuance of the Toxic Air Contaminant Permit Addendum.

(12) DEQ may require the owner or operator of a source to conduct and submit an additional multipathway risk evaluation for any level of risk assessment if DEQ determines that airborne deposition of chemicals could be important for scenarios not included in the default multipathway adjustment factor assumptions used in the original risk assessment for the source.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3 and 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015, 468A.035 & Or Laws 2018, ch. 102, §§ 2, 3, and 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0200
Risk Estimates

(1) When a risk assessment is required under this division, the risk assessment must consider the toxic air contaminants and the Risk-Based Concentrations listed in OAR 340-245-8040 Table 4 to assess excess cancer and noncancer risk.

(2) Directions for the Level 1 Risk Assessment Tool.

(a) An owner or operator that chooses to perform a Level 1 Risk Assessment under OAR 340-245-0050, must calculate a separate sum of risk ratios for each of the following categories: excess cancer risk, chronic noncancer risk, and acute noncancer risk for the applicable exposure locations;

(b) When making this calculation, the owner or operator must use the emissions inventory submitted under OAR 340-245-0040(1) for:

(A) Excess cancer risk and chronic noncancer risk, the average annual emission rates; and

(B) Acute noncancer risk, the maximum daily emission rates.

(c) The owner or operator must perform each of the following calculations in paragraphs (A) and (B), except as allowed in paragraph (C):

(A) For excess cancer risk and chronic noncancer risk:

(i) For each TEU, use the stack height and distance to the nearest exposure locations to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5A. If the TEU is a fugitive source, use the area and height of the building and distance to the nearest exposure locations to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5C;

(ii) For each TEU and each toxic air contaminant emitted from the TEU, multiply the annual emission rate by the dispersion factor identified under subparagraph (i) to calculate an air concentration at the nearest exposure location;

(iii) For each TEU, divide the air concentration of each toxic air contaminant calculated under subparagraph (ii) by the appropriate RBC of that toxic air contaminant under OAR 340-245-8040 Table 4;

(iv) For each TEU, add up the risk from each toxic air contaminant calculated under subparagraph (iii); and

(v) For all TEUs, add up all of the risks calculated under subparagraph (iv) to obtain the total excess cancer risk in one million or the total chronic noncancer Hazard Index for the entire source. For chronic noncancer risk, Hazard Indices may be calculated by noncancer target organ or organ systems in consultation with DEQ;

(vi) When an existing source emits a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5 as identified in OAR 340-245-8030, Table 3 and OAR 240-245-8040, Table 4, the owner or operator must calculate a Risk Determination Ratio using the formula in section (5) of this rule.

(B) For acute noncancer risk:

(i) For each TEU, use the stack height and distance to the nearest exposure location to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5B. If the TEU is a fugitive source, use the area and height of the building and distance to the nearest exposure locations to identify the appropriate dispersion factor under OAR 340-245-8050 Table 5D;

(ii) For each TEU and each toxic air contaminant emitted from the TEU, multiply the maximum daily emission rate by the dispersion factor identified under subparagraph (i) to calculate an air concentration at the nearest exposure location;

(iii) For each TEU, divide the air concentration of each toxic air contaminant calculated under subparagraph (ii) by the acute RBC for that toxic air contaminant under OAR 340-245-8040 Table 4;

(iv) For each TEU, add up the risk from each toxic air contaminant calculated under subparagraph (iii); and

(v) For all TEUs, add up all of the risks calculated under subparagraph (iv) to obtain the total acute noncancer Hazard Index for the entire source. Hazard Indices may be calculated by noncancer target organ or organ systems in consultation with DEQ;

(vi) When an existing source emits a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5 as identified in OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4, the owner or operator must calculate a Risk Determination Ratio using the formula in section (5) of this rule.

(C) Instead of using stack height and distance or area and height of the building and distance to the nearest exposure locations to obtain the appropriate dispersion factor under OAR 340-245-8050 Table 5, the owner or operator may instead use, as a default, the most conservative dispersion factor;

(i) For stack emissions, use the dispersion factor associated with a stack height of five meters and an exposure location distance of 50 meters, which is listed in the upper-left corner of OAR 340-245-8050 Table 5A and B;

(ii) For fugitive emissions, use the dispersion factor associated with an area of less than or equal to 3,000 square feet, a building height of less than or equal to 20 feet, and an exposure location distance of 50 meters, which is listed in the upper-left corner of OAR 340-245-8050 Table 5C and D; and

(iii) Using these default dispersion factors will result in protective calculations of risk. If the risks calculated using these default dispersion factors are less than or equal to the applicable Risk Action Levels, the owner or operator may choose to use the risks calculated in this manner to show compliance with the Source Risk Limits.

(3) Sum of Risk Ratios calculation procedure for Level 2, Level 3 and Level 4 Risk Assessments.

(a) An owner or operator that chooses to perform a Level 2, Level 3 or Level 4 Risk Assessment under OAR 340-245-0050, must calculate a separate sum of risk ratio for each of the following risk categories: excess cancer risk, chronic noncancer risk, and acute noncancer risk for the applicable exposure locations;

(b) When making this calculation, the owner or operator must use the following modeled ambient concentrations for each toxic air contaminant at all exposure locations:

(A) For excess cancer risk and chronic noncancer risk, the annual average concentrations must be used; and

(B) For acute noncancer risk, the maximum daily concentrations must be used;

(c) The owner or operator must perform the following calculations for each of the risk categories listed in subsection (a) and using the concentrations in subsection (b):

(A) For each TEU, divide the modeled concentration of each toxic air contaminant by the appropriate RBC of that toxic air contaminant under OAR 340-245-8040 Table 4, ensuring that the concentration is expressed in micrograms per cubic meter;

(B) For each TEU, add up the risk from each toxic air contaminant calculated under paragraph (A); and

(C) For all TEUs at each exposure location, add up all of the risks calculated under paragraph (B) to obtain the total excess cancer risk in one million, the total chronic noncancer Hazard Index, or the total acute noncancer Hazard Index for the entire source. For noncancer risk, Hazard Indices may be calculated by noncancer target organ or organ systems in consultation with DEQ.

(D) When an existing source emits a mixture of toxic air contaminants assigned noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5 as identified in OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4, the owner or operator must calculate a Risk Determination Ratio using the formula in section (5) of this rule

(4) Significant figures and rounding. When a risk is calculated for comparison to a Risk Action Level or Source Risk Limit:

(a) The final risk calculation must be rounded off as follows:

(A) For comparison to the Aggregate TEU Level, Risk Determination Ratio, and the Source Permit Level, round off to one decimal place; and

(B) For comparison to other Risk Action Levels or Source Risk Limits, round off to a whole number;

(b) Round up if the last figure to be rounded off is 5 or greater, otherwise round down.

(c) Use of rounded numbers in making final risk calculations is not allowed. Only the final risk number may be rounded as described in this section.

(5) Calculating a Risk Determination Ratio. The formula for calculating a Risk Determination Ratio is:

Combined Noncancer Risk for HI3 chemicals =

(Concentration of HI3 chemical #1 / Risk-Based Concentration for chemical #1) + (Concentration of HI3 chemical #2 / Risk-Based Concentration for chemical #2) + continue for all HI3 chemicals emitted

Combined Noncancer Risk for HI5 chemicals =

(Concentration of HI5 chemical #1 / Risk-Based Concentration for chemical #1) + (Concentration of HI5 chemical #2 / Risk-Based Concentration for chemical #2) + continue for all HI5 chemicals emitted

Risk Determination Ratio = (Combined Risk for HI3 chemicals / 3) + (Combined Risk for HI5 chemicals / 5)

HI3 = Toxic air contaminants assigned noncancer TBACT Risk Action Level of 3 (OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4) .

HI5 = Toxic air contaminants assigned noncancer TBACT Risk Action Level of 5 (OAR 340-245-8030, Table 3 and OAR 340-245-8040, Table 4) .

Concentration = monitored or modeled concentrations of toxic air contaminant at exposure location for use in risk assessment.

RBC = risk-based concentrations in OAR 340-245-8040 Table 4.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155 & Or Laws 2018, ch. 102, §§ 3 and 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015, 468A.035 & Or Laws 2018, ch. 102, §§ 2, 3 and 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-0320
Standards and Criteria for Noncancer Risk Action Levels for Existing Contamination Sources

(1) The noncancer Risk Action Levels for existing sources are identified in OAR 340-245-8010, Table 1.

(2) The toxic air contaminants for which an adjusted noncancer Risk Action Level will apply are identified in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4, in the column named “Noncancer TBACT RAL.”

(3) An adjusted Risk Action Level will be applied to existing sources that emit one or more toxic air contaminants identified in OAR 340-245-8030, Table 3, or OAR 340-245-8040, Table 4, with a noncancer TBACT RAL of a Hazard Index of 3. For sources that emit a mixture of toxic air contaminants with noncancer TBACT Risk Action Levels of both a Hazard Index of 3 and a Hazard Index of 5, the Risk Determination Ratio calculation expresses the degree to which the applicable Risk Action Level may be adjusted for each source.

Statutory/Other Authority: ORS 468.020 & Or Laws 2018, ch. 102, § 7.
Statutes/Other Implemented: Or Laws 2018, ch. 102, §7.
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-8010
Table 1 - Risk Action Levels

Table 1 - Risk Action Levels

[ED. NOTE: To view tables referenced in rule text, click here to view rule.]

OAR 340-245-8010
Table 1
Risk Action Levels†

Applicability	Risk Action Level	Excess Cancer Risk per Million	Noncancer Hazard Index
New and Reconstructed Source	Aggregate TEU Level	0.5	0.1
	Source Permit Level	0.5	0.5
	Community Engagement Level	5	1
	TLAER Level	10	1
	Permit Denial Level	25	1
Existing Source	Aggregate TEU Level	2.5	0.1
	Source Permit Level	5	0.5
	Community Engagement Level	25	1
	TBACT Level	50	5[a] ~~a~~ or 3[b] or Risk Determination Ratio of> 1.0[c]
	Risk Reduction Level	200	10[a] or 6[b] or Risk Determination Ratio of 2.0[c]
	Immediate Curtailment Level	500	20[a] or 12[b] or Risk Determination Ratio of 4.0[c]

Footnotes for OAR 340-245-8010 Table 1:

†Facility risk that is equal to or less than the values in the table is considered compliant with the Risk Action Level. Risk Action Levels are considered consistent with benchmarks in Oregon Laws 2018, chapter 102 (Senate Bill (SB) 1541 (2018)).

a If all toxic air contaminants emitted by the source are identified as HI5 in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4.

b If all toxic air contaminants emitted by the source are identified as HI3 in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4.

c If toxic air contaminants emitted by the source include contaminants listed as both HI3 and HI5 in OAR 340-245-8030, Table 3, and OAR 340-245-8040, Table 4, and a Risk Determination Ratio is required to be calculated under OAR 340-245-0200.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070 & 468A.155 and Or Laws 2018, ch. 102, § 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015 & 468A.035 and Or Laws 2018, ch. 102, § 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-8030
Table 3 - Toxicity Reference Values

Table 3 - Toxicity Reference Values

[ED. NOTE: To view tables referenced in rule text, click here to view rule.]

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
75-07-0	Acetaldehyde		HI3	0.45	A	140	O	470	O
60-35-5	Acetamide			0.050	O				
67-64-1	Acetone		HI3			31,000	T	62,000	S
75-05-8	Acetonitrile		HI3			60	I		
107-02-8	Acrolein		HI5			0.35	A	6.9	T
79-06-1	Acrylamide		HI3	0.010	I	6.0	I		
79-10-7	Acrylic acid		HI3			1.0	I	6,000	O
107-13-1	Acrylonitrile		HI3	0.015	A	5.0	O	220	T
309-00-2	Aldrin			0.00020	I				
107-05-1	Allyl chloride		HI3	0.17	O	1.0	I		

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
7429-90-5	Aluminum and compounds	O	HI5			5.0	P		
7664-41-7	Ammonia		HI3			500	A	1,200	T
62-53-3	Aniline		HI5	0.63	O	1.0	I		
7440-36-0	Antimony and compounds	o	HI3			0.30	T	1.0	T
140-57-8	Aramite			0.14	I				
7440-38-2	Arsenic and compounds	o	HI3	0.00023	A	0.015	O	0.20	S
7784-42-1	Arsine		HI3			0.015	O	0.20	O
1332-21-4	Asbestos	k		4.3E-06	I				
103-33-3	Azobenzene			0.032	I				
71-43-2	Benzene	j	HI3	0.13	A	3.0	O	29	T
92-87-5	Benzidine (and its salts)			7.1E-06	O				
100-44-7	Benzyl chloride		HI3	0.020	O	1.0	P	240	O
7440-41-7	Beryllium and compounds	o	HI3	0.00042	A	0.0070	O	0.020	S

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
111-44-4	*Bis*(2-chloroethyl) ether (BCEE)		HI3	0.0014	O			120	Tint
542-88-1	*Bis*(chloromethyl) ether		HI5	7.7E-05	O			1.4	Tint
117-81-7	*Bis*(2-ethylhexyl) phthalate (DEHP)			0.42	O				
75-25-2	Bromoform			0.91	I				
74-83-9	Bromomethane (Methyl bromide)		HI3			5.0	A	3,900	O
106-94-5	1-Bromopropane (*n*-propyl bromide)		HI3	0.48	A	33	T	1,700	T
106-99-0	1,3-Butadiene		HI3	0.033	A	2.0	O	660	O
78-93-3	2-Butanone (Methyl ethyl ketone)		HI3			5,000	I	5,000	S
78-92-2	*sec*-Butyl alcohol		HI3			30,000	P		
7440-43-9	Cadmium and compounds	o	HI3	0.00056	A	0.010	T	0.030	S
105-60-2	Caprolactam		HI3			2.2	O	50	O
75-15-0	Carbon disulfide		HI3			800	A	6,200	O
56-23-5	Carbon tetrachloride		HI3	0.17	A	100	I	1,900	O

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
463-58-1	Carbonyl sulfide		HI3			10	O	660	O
57-74-9	Chlordane	j	HI3	0.010	I	0.020	T	0.20	Tint
108171-26-2	Chlorinated paraffins	n		0.040	O				
7782-50-5	Chlorine		HI3			0.15	A	170	T
10049-04-4	Chlorine dioxide		HI3			0.60	O	2.8	Tint
532-27-4	2-Chloroacetophenone		HI5			0.030	I		
108-90-7	Chlorobenzene		HI3			50	P		
75-68-3	1-Chloro-1,1-difluoroethane		HI3			50,000	I		
75-45-6	Chlorodifluoromethane (Freon 22)		HI3			50,000	I		
75-00-3	Chloroethane (Ethyl chloride)		HI3			30,000	O	40,000	T
67-66-3	Chloroform		HI3		A2	300	A	490	T
74-87-3	Chloromethane (Methyl chloride)		HI3			90	A	1,000	T
95-83-0	4-Chloro-*o*-phenylenediamine			0.22	O				
76-06-2	Chloropicrin		HI3			0.40	O	29	O

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
126-99-8	Chloroprene		HI3	0.0033	I	20	I		
95-69-2	*p*-Chloro-*o*-toluidine			0.013	O				
18540-29-9	Chromium VI, chromate and dichromate particulate	d	HI3	8.3E-05	A	0.20	O	0.30	S
18540-29-9	Chromium VI, chromic acid aerosol mist	d	HI3	8.3E-05	A	0.0050	T	0.0050	S
7440-48-4	Cobalt and compounds	o	HI3		A2	0.10	A		
	Coke Oven Emissions			0.0016	I				
7440-50-8	Copper and compounds	o	HI3					100	O
120-71-8	*p*-Cresidine			0.023	O				
1319-77-3	Cresols (mixture), including *m*-cresol, *o*-cresol, *p*-cresol		HI3			600	O		
135-20-6	Cupferron			0.016	O				
74-90-8	Cyanide, Hydrogen		HI3			0.80	A	340	O
110-82-7	Cyclohexane		HI3			6,000	I		
50-29-3	DDT	e		0.010	I				
615-05-4	2,4-Diaminoanisole			0.15	O				

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
95-80-7	2,4-Diaminotoluene (2,4-Toluene diamine)			0.00091	O				
333-41-5	Diazinon		HI3					10	Tint
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)		HI3	0.00017	P	0.20	I	1.9	Tint
106-46-7	*p*-Dichlorobenzene (1,4-Dichlorobenzene)		HI3	0.091	A	60	T	12,000	T
91-94-1	3,3'-Dichlorobenzidine			0.0029	O				
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)			0.63	O				
156-60-5	*trans*-1,2-dichloroethene		HI3					790	T
75-09-2	Dichloromethane (Methylene chloride)		HI3	100	A	600	I	2,100	T
78-87-5	1,2-Dichloropropane (Propylene dichloride)		HI3			4.0	I	230	T
542-75-6	1,3-Dichloropropene		HI3	0.25	A	32	T	36	Tint
62-73-7	Dichlorovos (DDVP)		HI5			0.54	T	18	T
60-57-1	Dieldrin			0.00022	I				
	Diesel Particulate Matter		HI3	0.10	A	5.0	O		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
111-42-2	Diethanolamine		HI3			0.20	P		
112-34-5	Diethylene glycol monobutyl ether		HI3			0.10	P		
111-90-0	Diethylene glycol monoethyl ether		HI5			0.30	P		
75-37-6	1,1-Difluoroethane		HI5			40,000	I		
60-11-7	4-Dimethylaminoazobenzene			0.00077	O				
68-12-2	Dimethyl formamide		HI3			80	O		
57-14-7	1,1-Dimethylhydrazine		HI3					0.49	Tint
121-14-2	2,4-Dinitrotoluene			0.011	O				
123-91-1	1,4-Dioxane		HI3	0.20	I	30	I	7,200	T
122-66-7	1,2-Diphenylhydrazine (Hydrazobenzene)			0.0045	I				
1937-37-7	Direct Black 38			7.1E-06	O				
2602-46-2	Direct Blue 6			7.1E-06	O				
16071-86-6	Direct Brown 95 (technical grade)			7.1E-06	O				

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
298-04-4	Disulfoton		HI3					6.0	T
106-89-8	Epichlorohydrin		HI3	0.043	O	3.0	O	1,300	O
106-88-7	1,2-Epoxybutane		HI5			20	O		
140-88-5	Ethyl acrylate		HI3			8.0	P		
100-41-4	Ethyl benzene		HI3	0.40	A	260	T	22,000	T
106-93-4	Ethylene dibromide (EDB, 1,2-Dibromoethane)		HI3	0.0017	A	9.0	I		
107-06-2	Ethylene dichloride (EDC, 1,2-Dichloroethane)		HI3	0.038	A	7.0	P		
107-21-1	Ethylene glycol		HI3			400	O	2,000	T
111-76-2	Ethylene glycol monobutyl ether		HI3			82	O	29,000	T
110-80-5	Ethylene glycol monoethyl ether		HI3			70	O	370	O
111-15-9	Ethylene glycol monoethyl ether acetate		HI3			60	P	140	O
109-86-4	Ethylene glycol monomethyl ether		HI3			60	O	93	O
110-49-6	Ethylene glycol monomethyl ether acetate		HI3			1.0	P		

OAR 340-245-8030
Table 3
Toxicity Reference Values

			Noncancer TBACTRAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
75-21-8	Ethylene oxide		HI3	0.00033	A	30	O	160	Tint
96-45-7	Ethylene thiourea			0.077	O				
	Fluorides		HI3			13	A	240	O
7782-41-4	Fluorine gas		HI3					16	T
50-00-0	Formaldehyde		HI3	0.17	A	9.0	O	49	T
111-30-8	Glutaraldehyde		HI5			0.080	O	4.1	T
76-44-8	Heptachlor			0.00077	I				
1024-57-3	Heptachlor epoxide			0.00038	I				
118-74-1	Hexachlorobenzene			0.0020	O				
87-68-3	Hexachlorobutadiene			0.045	I				
608-73-1	Hexachlorocyclohexanes (mixture) including but not limited to:			0.00091	O				
319-84-6	Hexachlorocyclohexane, *alpha-*			0.00091	O				
319-85-7	Hexachlorocyclohexane, *beta-*			0.00091	O				

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
58-89-9	Hexachlorocyclohexane, *gamma*- (Lindane)			0.0032	O				
77-47-4	Hexachlorocyclopentadiene		HI3			0.20	I	110	Tint
67-72-1	Hexachloroethane		HI3			30	I	58,000	T
822-06-0	Hexamethylene-1,6-diisocyanate		HI5			0.069	T	0.21	Tint
110-54-3	Hexane		HI3			700	A		
302-01-2	Hydrazine		HI3	0.00020	O	0.030	P	5.2	Tint
7647-01-0	Hydrochloric acid		HI3			20	A	2,100	O
7664-39-3	Hydrogen fluoride		HI3			13	A	16	T
7783-06-4	Hydrogen sulfide		HI3			2.0	A	98	S
78-59-1	Isophorone		HI3			2,000	O		
67-63-0	Isopropyl alcohol		HI3			200	P	3,200	O
98-82-8	Isopropylbenzene (Cumene)		HI3			400	I		
7439-92-1	Lead and compounds	o	HI3		A2	0.15	A	0.15	S
108-31-6	Maleic anhydride		HI5			0.70	O		

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Table 3
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			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
7439-96-5	Manganese and compounds	o	HI3			0.090	A	0.30	S
7439-97-6	Mercury and compounds	o	HI3			0.30	A	0.60	O
67-56-1	Methanol		HI3			4,000	A	28,000	O
101-14-4	4,4'-Methylene *bis*(2-chloroaniline) (MOCA)			0.0023	O				
101-77-9	4,4'-Methylenedianiline (and its dichloride)		HI5	0.0022	O	20	O		
101-68-8	Methylene diphenyl diisocyanate (MDI)		HI3			0.080	O	12	O
108-10-1	Methyl isobutyl ketone (MIBK, Hexone)		HI3			3,000	I		
624-83-9	Methyl isocyanate		HI3			1.0	O		
80-62-6	Methyl methacrylate		HI5			700	I		
1634-04-4	Methyl *tert*-butyl ether		HI3	3.8	O	8,000	O	8,000	O
90-94-8	Michler's ketone			0.0040	O				
91-20-3	Naphthalene		HI3	0.029	A	3.7	T	200	S
	Nickel compounds, insoluble	f	HI3	0.0038	A	0.014	O	0.20	O

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Table 3
Toxicity Reference Values

			Noncancer TBACTRAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
	Nickel compounds, soluble	f	HI3		A2	0.014	A	0.20	O
7697-37-2	Nitric acid		HI5					86	O
98-95-3	Nitrobenzene		HI3	0.025	I	9.0	I		
79-46-9	2-Nitropropane		HI3			20	I		
924-16-3	*N*-Nitrosodi-*n*-butylamine			0.00032	O				
55-18-5	*N*-Nitrosodiethylamine			1.0E-04	O				
62-75-9	*N*-Nitrosodimethylamine			0.00022	O				
86-30-6	*N*-Nitrosodiphenylamine			0.38	O				
156-10-5	*p*-Nitrosodiphenylamine			0.16	O				
621-64-7	*N*-Nitrosodi-*n*-propylamine			0.00050	O				
10595-95-6	*N*-Nitrosomethylethylamine			0.00016	O				
59-89-2	*N*-Nitrosomorpholine			0.00053	O				

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
100-75-4	*N*-Nitrosopiperidine			0.00037	O				
930-55-2	*N*-Nitrosopyrrolidine			0.0017	O				
8014-95-7	Oleum (fuming sulfuric acid)		HI3					120	O
56-38-2	Parathion		HI3					0.020	Tint
87-86-5	Pentachlorophenol			0.20	O				
108-95-2	Phenol		HI3			200	O	5,800	O
75-44-5	Phosgene		HI3			0.30	A	4.0	O
7803-51-2	Phosphine		HI3			0.80	A		
7664-38-2	Phosphoric acid		HI3			10	A		
12185-10-3	Phosphorus, white		HI3			9.0	A	20	T
85-44-9	Phthalic anhydride		HI3			20	O		
	Polybrominated diphenyl ethers (PBDEs)	g	HI3					6.0	Tint
1336-36-3	Polychlorinated biphenyls (PCBs)			0.010	A				
	Polychlorinated biphenyls (PCBs) TEQ	h	HI3	2.6E-08	A1	4.E-05	O		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
32598-13-3	PCB 77 [3,3',4,4'-tetrachlorobiphenyl]	h	HI3	0.00026	A1	0.40	O		
70362-50-4	PCB 81 [3,4,4',5-tetrachlorobiphenyl]	h	HI3	8.8E-05	A1	0.13	O		
32598-14-4	PCB 105 [2,3,3',4,4'-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
74472-37-0	PCB 114 [2,3,4,4',5-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
31508-00-6	PCB 118 [2,3',4,4',5-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
65510-44-3	PCB 123 [2,3',4,4',5'-pentachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
57465-28-8	PCB 126 [3,3',4,4',5-pentachlorobiphenyl]	h	HI3	2.6E-07	A1	0.00040	O		
38380-08-4	PCB 156 [2,3,3',4,4',5-hexachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
69782-90-7	PCB 157 [2,3,3',4,4',5'-hexachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
52663-72-6	PCB 167 [2,3',4,4',5,5'-hexachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
32774-16-6	PCB 169 [3,3',4,4',5,5'-hexachlorobiphenyl]	h	HI3	8.8E-07	A1	0.0013	O		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
39635-31-9	PCB 189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]	h	HI3	0.00088	A1	1.3	O		
	Polychlorinated dibenzo-*p*-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ	h	HI3	2.6E-08	A1	4.0E-05	O		
1746-01-6	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)		HI3	2.6E-08	A	4.0E-05	O		
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin (PeCDD)	h	HI3	2.6E-08	A1	4.0E-05	O		
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	h	HI3	2.6E-07	A1	0.00040	O		
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	h	HI3	2.6E-07	A1	0.00040	O		
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin (HxCDD)	h	HI3	2.6E-07	A1	0.00040	O		
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin (HpCDD)	h	HI3	2.6E-06	A1	0.0040	O		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m^3)	Notes	(µg/m^3)	Notes	(µg/m^3)	Notes
3268-87-9	Octachlorodibenzo-*p*-dioxin (OCDD)	h	HI3	8.8E-05	A1	0.13	O		
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran (TcDF)	h	HI3	2.6E-07	A1	0.00040	O		
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	h	HI3	8.8E-07	A1	0.0013	O		
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	h	HI3	8.8E-08	A1	0.00013	O		
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	h	HI3	2.6E-07	A1	0.00040	O		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m^3)	Notes	(µg/m^3)	Notes	(µg/m^3)	Notes
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	h	HI3	2.6E-06	A1	0.0040	O		
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	h	HI3	2.6E-06	A1	0.0040	O		
39001-02-0	Octachlorodibenzofuran (OCDF)	h	HI3	8.8E-05	A1	0.13	O		
	Polycyclic aromatic hydrocarbons (PAHs)			0.0017	A				
191-26-4	Anthanthrene	i		0.0042	A1				
56-55-3	Benz[a]anthracene	i		0.0083	A1				
50-32-8	Benzo[a]pyrene	m	HI3	0.0017	A	0.0020	I	0.0020	I
205-99-2	Benzo[b]fluoranthene	i		0.0021	A1				
205-12-9	Benzo[c]fluorene	i		8.3E-05	A1				
191-24-2	Benzo[g,h,i]perylene	i		0.19	A1				
205-82-3	Benzo[j]fluoranthene	i		0.0056	A1				
207-08-9	Benzo[k]fluoranthene	i		0.056	A1				
218-01-9	Chrysene	i		0.017	A1				

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
27208-37-3	Cyclopenta[c,d]pyrene	i		0.0042	A1				
53-70-3	Dibenz[a,h]anthracene	i		0.00017	A1				
192-65-4	Dibenzo[a,e]pyrene	i		0.0042	A1				
189-64-0	Dibenzo[a,h]pyrene	i		0.0019	A1				
189-55-9	Dibenzo[a,i]pyrene	i		0.0028	A1				
191-30-0	Dibenzo[a,l]pyrene	i		5.6E-05	A1				
206-44-0	Fluoranthene	i		0.021	A1				
193-39-5	Indeno[1,2,3-cd]pyrene	i		0.024	A1				
3697-24-3	5-Methylchrysene	i		0.0017	A1				
7496-02-8	6-Nitrochrysene	i		0.00017	A1				
7758-01-2	Potassium bromate			0.0071	O				
1120-71-4	1,3-Propane sultone			0.0014	O				
123-38-6	Propionaldehyde		HI5			8.0	I		
115-07-1	Propylene		HI5			3,000	O		
6423-43-4	Propylene glycol dinitrate		HI5			0.27	T	20	T

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
107-98-2	Propylene glycol monomethyl ether		HI3			7,000	O		
75-56-9	Propylene oxide		HI3	0.27	O	30	O	3,100	O
	Refractory Ceramic Fibers	k	HI5			0.030	T		
7783-07-5	Selenide, hydrogen		HI3					5.0	O
7782-49-2	Selenium and compounds	j, o	HI3				A3	2.0	S
7631-86-9	Silica, crystalline (respirable)		HI5			3.0	O		
1310-73-2	Sodium hydroxide		HI3					8.0	O
100-42-5	Styrene		HI3			1,000	A	21,000	S
7664-93-9	Sulfuric acid		HI5			1.0	O	120	O
505-60-2	Sulfur Mustard		HI3					0.70	T
7446-71-9	Sulfur trioxide		HI5			1.0	O	120	O
630-20-6	1,1,1,2-Tetrachloroethane			0.14	I				
79-34-5	1,1,2,2-Tetrachloroethane			0.017	O				
127-18-4	Tetrachloroethene (Perchloroethylene)		HI3	3.8	A	41	T	41	T
811-97-2	1,1,1,2-Tetrafluoroethane		HI3			80,000	I		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
62-55-5	Thioacetamide			0.00059	O				
7550-45-0	Titanium tetrachloride		HI3			0.10	T	10	Tint
108-88-3	Toluene		HI3			5,000	A	7,500	T
26471-62-5	Toluene diisocyanates (2,4- and 2,6-)		HI3	0.091	O	0.021	A	0.071	T
8001-35-2	Toxaphene (Polychlorinated camphenes)			0.0031	I				
71-55-6	1,1,1-Trichloroethane (Methyl chloroform)		HI3			5,000	A	11,000	T
79-00-5	1,1,2-Trichloroethane (Vinyl trichloride)			0.063	O				
79-01-6	Trichloroethene (TCE, Trichloroethylene)		HI3	0.24	A	2.1	T	2.1	Tint
88-06-2	2,4,6-Trichlorophenol			0.050	O				
96-18-4	1,2,3-Trichloropropane		HI5			0.30	I	1.8	T
121-44-8	Triethylamine		HI3			200	O	2,800	O
526-73-8	1,2,3-Trimethylbenzene		HI3			60	I		
95-63-6	1,2,4-Trimethylbenzene		HI3			60	I		

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Table 3
Toxicity Reference Values

			Noncancer TBACT RAL [p]	Toxicity Reference Values (TRVs)					
				Chronic Cancer[a]		Chronic Noncancer[b]		Acute Noncancer[c]	
CAS#	Chemical	Notes		(µg/m³)	Notes	(µg/m³)	Notes	(µg/m³)	Notes
108-67-8	1,3,5-Trimethylbenzene		HI3			60	I		
51-79-6	Urethane (Ethyl carbamate)			0.0034	O				
7440-62-2	Vanadium (fume or dust)		HI3			0.10	T	0.80	T
1314-62-1	Vanadium pentoxide		HI3	0.00012	P	0.0070	P	30	O
108-05-4	Vinyl acetate	J	HI3			200	O	200	I
593-60-2	Vinyl bromide		HI5			3.0	I		
75-01-4	Vinyl chloride		HI3	0.11	I	100	I	1,300	T
75-35-4	Vinylidene chloride	J	HI3			200	I	200	I
1330-20-7	Xylene (mixture), including *m*-xylene, *o*-xylene, *p*-xylene		HI3			220	A	8,700	T

Notes:

a TRV based on a 1 in 1 million excess cancer risk.
TRV = $1x10^{-6}$ / IUR, where IUR = chemical-specific inhalation unit risk value [$(\mu g/m^3)^{-1}$].

b TRV based on chronic non-cancer value from authoritative sources ($\mu g/m^3$).

c TRV based on acute or subchronic non-cancer value from authoritative sources ($\mu g/m^3$).

d The TRVs presented for chromium are applicable to hexavalent chromium.

e DDT TRVs apply to the sum of DDT, DDE, and DDD compounds.

f As recommended by the ATSAC in 2018, the two categories of nickel compounds contain the following specific nickel compounds:

Soluble nickel compounds are considered to be emitted mainly in aerosol form, to be less potent carcinogens than insoluble nickel compounds, and include nickel acetate, nickel chloride, nickel carbonate, nickel hydroxide, nickelocene, nickel sulfate, nickel sulfate hexahydrate, nickel nitrate hexahydrate, nickel carbonate hydroxide.

Insoluble nickel compounds are considered to be emitted mainly in particulate form, to be more potent carcinogens than soluble nickel compounds, and to include nickel subsulfide, nickel oxide, nickel sulfide, nickel metal.

g TRVs apply to octabrominated diphenyl ethers (CAS# 32536-52-0) and pentabrominated diphenyl ethers (CAS# 32534-81-9), including BDE-99.

h TRV for chronic cancer calculated by applying toxicity equivalency factor to 2,3,7,8-TCDD TRV.

i TRV for chronic cancer calculated by applying toxicity equivalency factor to benzo[a]pyrene TRV.

j If the short-term toxicity reference value is lower than the chronic noncancer toxicity reference value, the chronic noncancer toxicity reference value was used for the short-term toxicity reference value because chronic noncancer toxicity reference values are generally more reliable.

k TRVs for asbestos and refractory ceramic fibers are in units of fibers/cm^3.

m Because benzo[a]pyrene can cause developmental effects, the chronic noncancer TRV is also used as the acute noncancer TRV.

n Chlorinated paraffins of average chain length of C12, approximately 60% chlorine by weight.

o An inorganic chemical designated with "and compounds" indicates that the TRV applies to the sum of all forms of the chemical, expressed as the inorganic element.

p. Noncancer TBACT RAL = noncancer Toxics Best Available Control Technology Risk Action Level, OAR 340-245-8010, Table 1.

Legend:

A = ATSAC, DEQ Air Toxics Science Advisory Committee, 2018.
A1 = ATSAC, 2018. TRV for cancer calculated by applying toxic equivalency factor.
A2 = Because the ATSAC decided it was inappropriate to develop an ABC based on carcinogenic effects, DEQ did not obtain a cancer TRV from the other authoritative sources.
A3 = Because the ATSAC decided it was inappropriate to develop an ABC based on noncarcinogenic effects, DEQ did not obtain a TRV from the other authoritative sources.
CAS# = Chemical Abstracts Service number
I = IRIS, EPA integrated risk information system
O = OEHHA, California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
P = PPRTV, EPA preliminary peer reviewed toxicity value
S = SGC, DEQ short-term guideline concentration
T = ATSDR, U.S. Agency for Toxic Substances and Disease Registry
TEQ = toxic equivalency, relative to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin.
Tint = ATSDR, intermediate minimal risk level
TRV = toxicity reference value

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070 & 468A.155 and Or Laws 2018, ch. 102, § 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015 & 468A.035 and Or Laws 2018, ch. 102, § 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

340-245-8040
Table 4 - Risk-Based Concentrations

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[ED. NOTE: To view tables referenced in rule text, click here to view rule.]

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Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
75-07-0	Acetaldehyde		HI3	0.45	140	12	620	5.5	620	470
60-35-5	Acetamide			0.050		1.3		0.60		
67-64-1	Acetone		HI3		31,000		140,000		140,000	62,000
75-05-8	Acetonitrile		HI3		60		260		260	
107-02-8	Acrolein		HI5		0.35		1.5		1.5	6.9
79-06-1	Acrylamide	g	HI3	0.0059	6.0	0.062	26	0.12	26	
79-10-7	Acrylic acid		HI3		1.0		4.4		4.4	6,000
107-13-1	Acrylonitrile		HI3	0.015	5.0	0.38	22	0.18	22	220
309-00-2	Aldrin			0.00020		0.0053		0.0024		
107-05-1	Allyl chloride		HI3	0.17	1.0	4.3	4.4	2.0	4.4	
7429-90-5	Aluminum and compounds	l	HI5		5.0		22		22	
7664-41-7	Ammonia		HI3		500		2,200		2,200	1,200
62-53-3	Aniline		HI5	0.63	1.0	16	4.4	7.5	4.4	
7440-36-0	Antimony and compounds	l	HI3		0.30		1.3		1.3	
140-57-8	Aramite			0.14		3.7		1.7		
7440-38-2	Arsenic and compounds	l	HI3	2.4E-05	0.00017	0.0013	0.0024	0.00062	0.0024	0.20
7784-42-1	Arsine		HI3		0.015		0.066		0.066	0.20
1332-21-4	Asbestos	I		4.3E-06		0.00011		5.2E-05		
103-33-3	Azobenzene			0.032		0.84		0.39		
71-43-2	Benzene		HI3	0.13	3.0	3.3	13	1.5	13	29

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Table 4
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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
92-87-5	Benzidine (and its salts)	G		4.2E-06		4.4E-05		8.6E-05		
100-44-7	Benzyl chloride		HI3	0.020	1.0	0.53	4.4	0.24	4.4	240
7440-41-7	Beryllium and compounds	L	HI3	0.00042	0.0070	0.011	0.031	0.0050	0.031	0.020
111-44-4	*Bis*(2-chloroethyl) ether (BCEE)		HI3	0.0014		0.037		0.017		120
542-88-1	*Bis*(chloromethyl) ether		HI5	7.7E-05		0.0020		0.00092		1.4
117-81-7	*Bis*(2-ethylhexyl) phthalate (DEHP)	C		0.080		11		5.0		
75-25-2	Bromoform			0.91		24		11		
74-83-9	Bromomethane (Methyl bromide)		HI3		5.0		22		22	3,900
106-94-5	1-Bromopropane (n-propyl bromide)		HI3	0.48	33	12	150	5.7	150	1,700
106-99-0	1,3-Butadiene		HI3	0.033	2.0	0.86	8.8	0.40	8.8	660
78-93-3	2-Butanone (Methyl ethyl ketone)		HI3		5,000		22,000		22,000	5,000
78-92-2	*sec*-Butyl alcohol		HI3		30,000		130,000		130,000	
7440-43-9	Cadmium and compounds	c, l	HI3	0.00056	0.0050	0.014	0.037	0.0067	0.037	0.030
105-60-2	Caprolactam		HI3		2.2		9.7		9.7	50
75-15-0	Carbon disulfide		HI3		800		3,500		3,500	6,200
56-23-5	Carbon tetrachloride		HI3	0.17	100	4.3	440	2.0	440	1,900
463-58-1	Carbonyl sulfide		HI3		10		44		44	660
57-74-9	Chlordane		HI3	0.010	0.020	0.26	0.088	0.12	0.088	0.20
108171-26-2	Chlorinated paraffins	j		0.040		1.0		0.48		
7782-50-5	Chlorine		HI3		0.15		0.66		0.66	170
10049-04-4	Chlorine dioxide		HI3		0.60		2.6		2.6	2.8
532-27-4	2-Chloroacetophenone		HI5		0.030		0.13		0.13	
108-90-7	Chlorobenzene		HI3		50		220		220	
75-68-3	1-Chloro-1,1-difluoroethane		HI3		50,000		220,000		220,000	

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
75-45-6	Chlorodifluoromethane (Freon 22)		HI3		50,000		220,000		220,000	
75-00-3	Chloroethane (Ethyl chloride)		HI3		30,000		130,000		130,000	40,000
67-66-3	Chloroform		HI3		300		1,300		1,300	490
74-87-3	Chloromethane (Methyl chloride)		HI3		90		400		400	1,000
95-83-0	4-Chloro-*o*-phenylenediamine			0.22		5.7		2.6		
76-06-2	Chloropicrin		HI3		0.40		1.8		1.8	29
126-99-8	Chloroprene		HI3	0.0033	20	0.087	88	0.040	88	
95-69-2	*p*-Chloro-*o*-toluidine			0.013		0.34		0.16		
18540-29-9	Chromium VI, chromate and dichromate particulate	c, d	HI3	3.1E-05	0.083	0.00052	0.88	0.0010	0.88	0.30
18540-29-9	Chromium VI, chromic acid aerosol mist	c, d	HI3	3.1E-05	0.0021	0.00052	0.022	0.0010	0.022	0.0050
7440-48-4	Cobalt and compounds	l	HI3		0.10		0.44		0.44	
	Coke Oven Emissions	g		0.00095		0.0100		0.019		
7440-50-8	Copper and compounds	l	HI3							100
120-71-8	*p*-Cresidine			0.023		0.60		0.28		
1319-77-3	Cresols (mixture), including *m*-cresol, *o*-cresol, *p*-cresol		HI3		600		2,600		2,600	
135-20-6	Cupferron			0.016		0.41		0.19		
74-90-8	Cyanide, Hydrogen		HI3		0.80		3.5		3.5	340
110-82-7	Cyclohexane		HI3		6,000		26,000		26,000	
50-29-3	DDT	e		0.010		0.27		0.12		
615-05-4	2,4-Diaminoanisole			0.15		3.9		1.8		
95-80-7	2,4-Diaminotoluene (2,4-Toluene diamine)			0.00091		0.024		0.011		
333-41-5	Diazinon		HI3							10
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	g	HI3	9.8E-05	0.20	0.0010	0.88	0.0020	0.88	1.9

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Table 4
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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
106-46-7	*p*-Dichlorobenzene (1,4-Dichlorobenzene)		HI3	0.091	60	2.4	260	1.1	260	12,000
91-94-1	3,3'-Dichlorobenzidine			0.0029		0.076		0.035		
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)			0.63		16		7.5		
156-60-5	*trans*-1,2-dichloroethene		HI3							790
75-09-2	Dichloromethane (Methylene chloride)		HI3	59	600	620	2,600	1,200	2,600	2,100
78-87-5	1,2-Dichloropropane (Propylene dichloride)		HI3		4.0		18		18	230
542-75-6	1,3-Dichloropropene		HI3	0.25	32	6.5	140	3.0	140	36
62-73-7	Dichlorovos (DDVP)		HI5		0.54		2.4		2.4	18
60-57-1	Dieldrin			0.00022		0.0057		0.0026		
	Diesel Particulate Matter		HI3	0.10	5.0	2.6	22	1.2	22	
111-42-2	Diethanolamine		HI3		0.20		0.88		0.88	
112-34-5	Diethylene glycol monobutyl ether		HI3		0.10		0.44		0.44	
111-90-0	Diethylene glycol monoethyl ether		HI5		0.30		1.3		1.3	
75-37-6	1,1-Difluoroethane		HI5		40,000		180,000		180,000	
60-11-7	4-Dimethylaminoazobenzene			0.00077		0.020		0.0092		
68-12-2	Dimethyl formamide		HI3		80		350		350	
57-14-7	1,1-Dimethylhydrazine		HI3							0.49
121-14-2	2,4-Dinitrotoluene			0.011		0.29		0.13		
123-91-1	1,4-Dioxane		HI3	0.20	30	5.2	130	2.4	130	7,200
122-66-7	1,2-Diphenylhydrazine (Hydrazobenzene)			0.0045		0.12		0.055		
1937-37-7	Direct Black 38			7.1E-06		0.00019		8.6E-05		
2602-46-2	Direct Blue 6			7.1E-06		0.00019		8.6E-05		
16071-86-6	Direct Brown 95 (technical grade)			7.1E-06		0.00019		8.6E-05		

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
298-04-4	Disulfoton		HI3							6.0
106-89-8	Epichlorohydrin		HI3	0.043	3.0	1.1	13	0.52	13	1,300
106-88-7	1,2-Epoxybutane		HI5		20		88		88	
140-88-5	Ethyl acrylate		HI3		8.0		35		35	
100-41-4	Ethyl benzene		HI3	0.40	260	10	1,100	4.8	1,100	22,000
106-93-4	Ethylene dibromide (EDB, 1,2-Dibromoethane)		HI3	0.0017	9.0	0.043	40	0.020	40	
107-06-2	Ethylene dichloride (EDC, 1,2-Dichloroethane)		HI3	0.038	7.0	1.0	31	0.46	31	
107-21-1	Ethylene glycol		HI3		400		1,800		1,800	2,000
111-76-2	Ethylene glycol monobutyl ether		HI3		82		360		360	29,000
110-80-5	Ethylene glycol monoethyl ether		HI3		70		310		310	370
111-15-9	Ethylene glycol monoethyl ether acetate		HI3		60		260		260	140
109-86-4	Ethylene glycol monomethyl ether		HI3		60		260		260	93
110-49-6	Ethylene glycol monomethyl ether acetate		HI3		1.0		4.4		4.4	
75-21-8	Ethylene oxide	g	HI3	0.00020	30	0.0021	130	0.0040	130	160
96-45-7	Ethylene thiourea			0.077		2.0		0.92		
	Fluorides	c	HI3		2.3		20		20	240
7782-41-4	Fluorine gas		HI3							16
50-00-0	Formaldehyde		HI3	0.17	9.0	4.3	40	2.0	40	49
111-30-8	Glutaraldehyde		HI5		0.080		0.35		0.35	4.1
76-44-8	Heptachlor			0.00077		0.020		0.0092		
1024-57-3	Heptachlor epoxide			0.00038		0.010		0.0046		
118-74-1	Hexachlorobenzene			0.0020		0.051		0.024		
87-68-3	Hexachlorobutadiene			0.045		1.2		0.55		

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
608-73-1	Hexachlorocyclohexanes (mixture) including but not limited to:	c		0.00017		0.018		0.0084		
319-84-6	Hexachlorocyclohexane, *alpha*-	c		0.00017		0.018		0.0084		
319-85-7	Hexachlorocyclohexane, *beta*-	c		0.00017		0.018		0.0084		
58-89-9	Hexachlorocyclohexane, *gamma*- (Lindane)	c		0.00060		0.065		0.030		
77-47-4	Hexachlorocyclopentadiene		HI3		0.20		0.88		0.88	110
67-72-1	Hexachloroethane		HI3		30		130		130	58,000
822-06-0	Hexamethylene-1,6-diisocyanate		HI5		0.069		0.30		0.30	0.21
110-54-3	Hexane		HI3		700		3,100		3,100	
302-01-2	Hydrazine		HI3	0.00020	0.030	0.0053	0.13	0.0024	0.13	5.2
7647-01-0	Hydrochloric acid		HI3		20		88		88	2,100
7664-39-3	Hydrogen fluoride	c	HI3		2.1		19		19	16
7783-06-4	Hydrogen sulfide		HI3		2.0		8.8		8.8	98
78-59-1	Isophorone		HI3		2,000		8,800		8,800	
67-63-0	Isopropyl alcohol		HI3		200		880		880	3,200
98-82-8	Isopropylbenzene (Cumene)		HI3		400		1,800		1,800	
7439-92-1	Lead and compounds	c, l	HI3		0.15		0.66		0.66	0.15
108-31-6	Maleic anhydride		HI5		0.70		3.1		3.1	
7439-96-5	Manganese and compounds	l	HI3		0.090		0.40		0.40	0.30
7439-97-6	Mercury and compounds	c, l	HI3		0.077		0.63		0.63	0.60
67-56-1	Methanol		HI3		4,000		18,000		18,000	28,000
101-14-4	4,4'-Methylene *bis*(2-chloroaniline) (MOCA)			0.0023		0.060		0.028		
101-77-9	4,4'-Methylenedianiline (and its dichloride)		HI5	0.00030	20	0.023	88	0.010	88	

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
101-68-8	Methylene diphenyl diisocyanate (MDI)		HI3		0.080		0.35		0.35	12
108-10-1	Methyl isobutyl ketone (MIBK, Hexone)		HI3		3,000		13,000		13,000	
624-83-9	Methyl isocyanate		HI3		1.0		4.4		4.4	
80-62-6	Methyl methacrylate		HI5		700		3,100		3,100	
1634-04-4	Methyl *tert*-butyl ether		HI3	3.8	8,000	100	35,000	46	35,000	8,000
90-94-8	Michler's ketone			0.0040		0.10		0.048		
91-20-3	Naphthalene	c	HI3	0.029	3.7	0.76	16	0.35	16	200
	Nickel compounds, insoluble	f	HI3	0.0038	0.014	0.10	0.062	0.046	0.062	0.20
	Nickel compounds, soluble	f	HI3		0.014		0.062		0.062	0.20
7697-37-2	Nitric acid		HI5							86
98-95-3	Nitrobenzene		HI3	0.025	9.0	0.65	40	0.30	40	
79-46-9	2-Nitropropane		HI3		20		88		88	
924-16-3	*N*-Nitrosodi-*n*-butylamine			0.00032		0.0084		0.0039		
55-18-5	*N*-Nitrosodiethylamine	g		5.9E-05		0.00062		0.0012		
62-75-9	*N*-Nitrosodimethylamine	g		0.00013		0.0013		0.0026		
86-30-6	*N*-Nitrosodiphenylamine			0.38		10		4.6		
156-10-5	*p*-Nitrosodiphenylamine			0.16		4.1		1.9		
621-64-7	*N*-Nitrosodi-*n*-propylamine			0.00050		0.013		0.0060		
10595-95-6	*N*-Nitrosomethylethylamine			0.00016		0.0041		0.0019		
59-89-2	*N*-Nitrosomorpholine			0.00053		0.014		0.0063		
100-75-4	*N*-Nitrosopiperidine			0.00037		0.0096		0.0044		
930-55-2	*N*-Nitrosopyrrolidine			0.0017		0.043		0.020		
8014-95-7	Oleum (fuming sulfuric acid)		HI3							120
56-38-2	Parathion		HI3							0.020
87-86-5	Pentachlorophenol			0.20		5.1		2.4		
108-95-2	Phenol		HI3		200		880		880	5,800

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Table 4
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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
75-44-5	Phosgene		HI3		0.30		1.3		1.3	4.0
7803-51-2	Phosphine		HI3		0.80		3.5		3.5	
7664-38-2	Phosphoric acid		HI5		10		44		44	
12185-10-3	Phosphorus, white		HI3		9.0		40		40	20
85-44-9	Phthalic anhydride		HI3		20		88		88	
	Polybrominated diphenyl ethers (PBDEs)	h	HI3							6.0
1336-36-3	Polychlorinated biphenyls (PCBs)	c		0.00053		0.020		0.0092		
	Polychlorinated biphenyls (PCBs) TEQ	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
32598-13-3	PCB 77 [3,3',4,4'-tetrachlorobiphenyl]	c	HI3	1.0E-05	0.0013	0.00090	0.26	0.00042	0.26	
70362-50-4	PCB 81 [3,4,4',5-tetrachlorobiphenyl]	c	HI3	3.4E-06	0.00042	0.00030	0.085	0.00014	0.085	
32598-14-4	PCB 105 [2,3,3',4,4'-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
74472-37-0	PCB 114 [2,3,4,4',5-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
31508-00-6	PCB 118 [2,3',4,4',5-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
65510-44-3	PCB 123 [2,3',4,4',5'-pentachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
57465-28-8	PCB 126 [3,3',4,4',5-pentachlorobiphenyl]	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
38380-08-4	PCB 156 [2,3,3',4,4',5-hexachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
69782-90-7	PCB 157 [2,3,3',4,4',5'-hexachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
52663-72-6	PCB 167 [2,3',4,4',5,5'-hexachlorobiphenyl]	c	HI3	3.4E-05	0.0042	0.0030	0.85	0.0014	0.85	
32774-16-6	PCB 169 [3,3',4,4',5,5'-hexachlorobiphenyl]	c	HI3	3.4E-08	4.2E-06	3.0E-06	0.00085	1.4E-06	0.00085	

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			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
39635-31-9	PCB 189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]	c	HI3	0.00088	1.3	0.023	5.7	0.011	5.7	
	Polychlorinated dibenzo-*p*-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
1746-01-6	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin (PeCDD)	c	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin (HxCDD)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin (HpCDD)	c	HI3	1.0E-07	1.3E-05	9.0E-06	0.0026	4.2E-06	0.0026	
3268-87-9	Octachlorodibenzo-*p*-dioxin (OCDD)	c	HI3	3.4E-06	0.00042	0.00030	0.085	0.00014	0.085	
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran (TcDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	c	HI3	3.4E-08	4.2E-06	3.0E-06	0.00085	1.4E-06	0.00085	
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	c	HI3	3.4E-09	4.2E-07	3.0E-07	8.5E-05	1.4E-07	8.5E-05	
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	

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Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	c	HI3	1.0E-08	1.3E-06	9.0E-07	0.00026	4.2E-07	0.00026	
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	c	HI3	1.0E-07	1.3E-05	9.0E-06	0.0026	4.2E-06	0.0026	
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	c	HI3	1.0E-07	1.3E-05	9.0E-06	0.0026	4.2E-06	0.0026	
39001-02-0	Octachlorodibenzofuran (OCDF)	c	HI3	3.4E-06	0.00042	0.00030	0.085	0.00014	0.085	
	Polycyclic aromatic hydrocarbons (PAHs)	c, g		4.3E-05		0.0016		0.0030		
191-26-4	Anthanthrene	c, g		0.00011		0.0039		0.0076		
56-55-3	Benz[a]anthracene	c, g		0.00021		0.0078		0.015		
50-32-8	Benzo[a]pyrene	c, g	HI3	4.3E-05	0.0020	0.0016	0.0088	0.0030	0.0088	0.0020
205-99-2	Benzo[b]fluoranthene	c, g		5.3E-05		0.0020		0.0038		
205-12-9	Benzo[c]fluorene	c, g		2.1E-06		7.8E-05		0.00015		
191-24-2	Benzo[g,h,i]perylene	c, g		0.0047		0.17		0.34		
205-82-3	Benzo[j]fluoranthene	c, g		0.00014		0.0052		0.010		
207-08-9	Benzo[k]fluoranthene	c, g		0.0014		0.052		0.10		
218-01-9	Chrysene	c, g		0.00043		0.016		0.030		
27208-37-3	Cyclopenta[c,d]pyrene	c, g		0.00011		0.0039		0.0076		
53-70-3	Dibenz[a,h]anthracene	c, g		4.3E-06		0.00016		0.00030		
192-65-4	Dibenzo[a,e]pyrene	c, g		0.00011		0.0039		0.0076		
189-64-0	Dibenzo[a,h]pyrene	c, g		4.7E-05		0.0017		0.0034		

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Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
189-55-9	Dibenzo[a,i]pyrene	c, g		7.1E-05		0.0026		0.0051		
191-30-0	Dibenzo[a,l]pyrene	c, g		1.4E-06		5.2E-05		0.00010		
206-44-0	Fluoranthene	c, g		0.00053		0.020		0.038		
193-39-5	Indeno[1,2,3-cd]pyrene	c, g		0.00061		0.022		0.043		
3697-24-3	5-Methylchrysene	c, g		4.3E-05		0.0016		0.0030		
7496-02-8	6-Nitrochrysene	c, g		4.3E-06		0.00016		0.00030		
7758-01-2	Potassium bromate			0.0071		0.19		0.086		
1120-71-4	1,3-Propane sultone			0.0014		0.038		0.017		
123-38-6	Propionaldehyde		HI5		8.0		35		35	
115-07-1	Propylene		HI5		3,000		13,000		13,000	
6423-43-4	Propylene glycol dinitrate		HI5		0.27		1.2		1.2	20
107-98-2	Propylene glycol monomethyl ether		HI3		7,000		31,000		31,000	
75-56-9	Propylene oxide		HI3	0.27	30	7.0	130	3.2	130	3,100
	Refractory Ceramic Fibers	i	HI5		0.030		0.13		0.13	
7783-07-5	Selenide, hydrogen		HI3							5.0
7782-49-2	Selenium and compounds	l	HI3							2.0
7631-86-9	Silica, crystalline (respirable)		HI5		3.0		13		13	
1310-73-2	Sodium hydroxide		HI3							8.0
100-42-5	Styrene		HI3		1,000		4,400		4,400	21,000
7664-93-9	Sulfuric acid		HI5		1.0		4.4		4.4	120
505-60-2	Sulfur Mustard		HI3							0.70
7446-71-9	Sulfur trioxide		HI5		1.0		4.4		4.4	120
630-20-6	1,1,1,2-Tetrachloroethane			0.14		3.5		1.6		
79-34-5	1,1,2,2-Tetrachloroethane			0.017		0.45		0.21		
127-18-4	Tetrachloroethene (Perchloroethylene)		HI3	3.8	41	100	180	46	180	41
811-97-2	1,1,1,2-Tetrafluoroethane		HI3		80,000		350,000		350,000	

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Table 4
Risk-Based Concentrations

			Non cancer TBACTRAL [m]	Residential Chronic		Non-Residential Chronic				Acute
				Cancer RBC[a]	Non-cancer RBC[a]	Child Cancer RBC[a]	Child Non-cancer RBC[a]	Worker Cancer RBC[a]	Worker Non-cancer RBC[a]	Non-cancer RBC[a]
CAS#[b]	Chemical	Notes		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
62-55-5	Thioacetamide			0.00059		0.015		0.0071		
7550-45-0	Titanium tetrachloride		HI3		0.10		0.44		0.44	10
108-88-3	Toluene		HI3		5,000		22,000		22,000	7,500
26471-62-5	Toluene diisocyanates (2,4- and 2,6-)		HI3	0.091	0.021	2.4	0.092	1.1	0.092	0.071
8001-35-2	Toxaphene (Polychlorinated camphenes)			0.0031		0.081		0.038		
71-55-6	1,1,1-Trichloroethane (Methyl chloroform)		HI3		5,000		22,000		22,000	11,000
79-00-5	1,1,2-Trichloroethane (Vinyl trichloride)			0.063		1.6		0.75		
79-01-6	Trichloroethene (TCE, Trichloroethylene)	g	HI3	0.20	2.1	3.5	9.2	2.9	9.2	2.1
88-06-2	2,4,6-Trichlorophenol			0.050		1.3		0.60		
96-18-4	1,2,3-Trichloropropane		HI5		0.30		1.3		1.3	1.8
121-44-8	Triethylamine		HI3		200		880		880	2,800
526-73-8	1,2,3-Trimethylbenzene		HI3		60		260		260	
95-63-6	1,2,4-Trimethylbenzene		HI3		60		260		260	
108-67-8	1,3,5-Trimethylbenzene		HI3		60		260		260	
51-79-6	Urethane (Ethyl carbamate)	g		0.0020		0.021		0.041		
7440-62-2	Vanadium (fume or dust)		HI3		0.10		0.44		0.44	0.80
1314-62-1	Vanadium pentoxide		HI3	0.00012	0.0070	0.0031	0.031	0.0014	0.031	30
108-05-4	Vinyl acetate		HI3		200		880		880	200
593-60-2	Vinyl bromide		HI5		3.0		13		13	
75-01-4	Vinyl chloride	g, k	HI3	0.11	100	0.22	440	2.7	440	1,300
75-35-4	Vinylidene chloride		HI3		200		880		880	200
1330-20-7	Xylene (mixture), including *m*-xylene, *o*-xylene, *p*-xylene		HI3		220		970		970	8,700

Notes:

a RBC = Risk-Based Concentration

b CAS# = Chemical Abstracts Service number

c Chronic RBCs include factors for multipathway risk.

d The RBCs presented for chromium are applicable to hexavalent chromium. In the absence of data indicating otherwise, assume that any total chromium (i.e., unspeciated) that is measured or modeled is entirely in the hexavalent form. Determine, based on information about the source of emissions, whether hexavalent chromium is emitted in aerosol or particulate form, and apply the corresponding RBC. Because there are no RBCs for trivalent chromium, a source determined to be emitting only trivalent chromium cannot be shown to pose an unacceptable risk, so the risk in this case will be considered acceptable.

e DDT RBCs apply to the sum of DDT, DDE, and DDD compounds.

f As recommended by DEQ's Air Toxics Science Advisory Committee (ATSAC) in 2018, the two categories of nickel compounds contain the following specific nickel compounds:
Soluble nickel compounds are considered to be emitted mainly in aerosol form, to be less potent carcinogens than insoluble nickel compounds, and include nickel acetate, nickel chloride, nickel carbonate, nickel hydroxide, nickelocene, nickel sulfate, nickel sulfate hexahydrate, nickel nitrate hexahydrate, nickel carbonate hydroxide.
Insoluble nickel compounds are considered to be emitted mainly in particulate form, to be more potent carcinogens than soluble nickel compounds, and to include nickel subsulfide, nickel oxide, nickel sulfide, nickel metal.

g RBCs adjusted to protect early-life exposure to infants and children because chemical is carcinogenic by a mutagenic mode of action.

h RBCs apply to octabrominated diphenyl ethers (CAS# 32536-52-0) and pentabrominated diphenyl ethers (CAS# 32534-81-9), including BDE-99.

i RBCs for asbestos and refractory ceramic fibers are in units of fibers/cm^3.

j Chlorinated paraffins of average chain length of C12, approximately 60% chlorine by weight.

k DEQ followed the ATSAC recommendation to develop a vinyl chloride TRV that already includes early-life exposure.

l An inorganic chemical designated with "and compounds" indicates that the RBC applies to the sum of all forms of the chemical, expressed as the inorganic element.

m Noncancer TBACT RAL = noncancer Toxics Best Available Control Technology Risk Action Level, OAR 340-245-8010, Table 1.

Statutory/Other Authority: ORS 468.020, 468.065, 468A.025, 468A.040, 468A.050, 468A.070 & 468A.155 and Or Laws 2018, ch. 102, § 7
Statutes/Other Implemented: 468.065, 468A.025, 468A.040, 468A.050, 468A.070, 468A.155, 468A.010, 468A.015 & 468A.035 and Or Laws 2018, ch. 102, § 7
History: DEQ 197-2018, adopt filed 11/16/2018, effective 11/16/2018

Responses to Comment Categories for Proposed Hazard Index Rules

DEQ created 31 different comment categories to respond to comments made in 202 comment submittals. These Comment Categories can be cross-referenced back to the original comments, using Attachment D and Table B1, below. In Attachment D, each comment is followed by the relevant Comment Category numbers.

Table B1
Cross-Reference: Comment Numbers to Comment Category

Comment Category	Comment Numbers
#1	1 -13, 16-31, 33-98, 100, 102-107, 110-137, 140-144, 150, 158, 159, 163, 169, 170, 176,177, 180-182, 186-191, 194, 197, 198
#2	37-43, 45-53, 191
#3	1-12, 14, 18, 23-25, 33, 34, 44, 57, 58, 73-75, 82, 85, 90, 99-107, 112, 114-120, 122, 131, 141, 144, 163, 169, 175-183, 186-191, 194, 197
#4	187
#5	187, 188, 189, 190, 191, 194, 197
#6	199-202
#7	201
#8	3-11, 13-20, 22, 28, 29, 57, 68, 77, 84, 87, 88, 91, 93, 98, 100, 103, 106, 111, 113, 117-120, 177, 188, 191, 197
#9	32
#10	107, 108, 109, 110, 149, 190
#11	50, 77, 103
#12	193, 195, 198
#13	185
#14	2, 87
#15	104
#16	197
#17	193, 195, 198
#18	193, 195, 198
#19	193, 195, 198
#20	193, 195, 198
#21	193, 195, 198
#22	193, 195, 198
#23	193, 195, 198
#24	193, 195, 198
#25	193, 195, 198
#26	193, 195, 198
#27	192, 193, 195, 198

#28	195, 198
#29	197
#30	184
#31	138, 139, 164

Comment Category #1: Regulate all 182 chemicals that cause noncancer health effects to a Hazard Index of 3.

Description

Use the most protective, legally allowable standard of a Hazard Index (HI) 3 to regulate the 182 toxic air contaminants that have noncancer health effects. DEQ should accept the recommendation of its Technical Advisory Committee and regulate all non-cancer air toxic contaminants at an HI of 3. All 182 of the noncancer toxic air contaminants have an effect on one or more organs or systems in the body, and any of these effects should be considered to be severe, based on the standard definition of the term "severe". This will be consistent with the mandate of Senate Bill 1541 (2018) (Oregon Laws 2018, chapter 102), which directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.

Response

Senate Bill 1541 established a benchmark for existing facilities of at HI 5. The bill also established a process to set lower noncancer benchmarks for certain toxic air contaminants that are expected to cause developmental or "other severe" human health effects. Such chemicals could be regulated at a Hazard Index other than 5, but not lower than 3. The bill provided that a panel of outside experts be convened as a Technical Advisory Committee for this process, and that the EQC take their recommendations into consideration. DEQ convened the committee was convened, held public meetings on Oct. 23 and Dec. 4, 2018.

The Technical Advisory Committee was charged with making recommendations, but not with arriving at consensus. To clarify, the Committee did not recommend regulating all 182 toxic air contaminants that have noncancer effects at an HI of 3. Committee members discussed the possibility that any of the 182 chemicals could have a severe health effect on an individual, depending on the susceptibility of the recipient of the dose of that chemical; for example, some people have no reaction to a bee string, while for others a bee sting is life-threatening. They did agree that the science describes health effects to specific organs or organ systems (e.g., respiratory, cardiovascular) and does not categorize health effects of chemical exposure using the term "severe." This meant the agencies had to seek other criteria for determining a chemical has "other severe" human health effects.

Informed by the deliberations of the Technical Advisory Committee and the Rules Advisory Committee, DEQ and OHA propose using four parameters with which to identify toxic air contaminants that could be regulated at a Hazard Index less than 5. These four parameters are:

1.) The chemical is expected to have **developmental effects**.

2.) The chemical is expected to have **other severe human health effects** defined as:
   a. Reproductive effects.
   b. Impacts to multiple organ systems, as reflected in the toxicity reference value that protects against more than one impact.
   c. Listed as an Inhalation Hazard, Hazard Classes 2.3 and 6.1, by the U.S. Department of Transportation. These are materials which the Department of Transportation has designated as hazardous materials for purposes of transportation. In the cases of Hazard Classes 2.3 and 6.1, the chemicals are listed as poison gases or as poison inhalation hazards, respectively.

In identifying which chemicals to recommend to be regulated at an HI of 3, DEQ and OHA found that 26 of the 182 chemicals evaluated did not have any of these four types of characteristics. Under the proposed rule amendments, these 26 chemicals will continue to be regulated at a Hazard Index of 5 for existing facilities.

DEQ did not change the proposed rules in response to this comment.

Comment Category #2: A hazard index of 3 should be used for any of the regulated air toxics that do not have a temporary and reversible physiological effect and can thus be regarded as having a severe impact on human health.

Description
Same as Comment Category name.

Response
Authoritative sources of toxicology information do not consistently report if the expected health effects are temporary and reversible. If that information is available, there is often uncertainty around that conclusion. For example, it can be unknown if the effect was temporary or reversible due to the study design (e.g. length of chemical exposure, exposure route, exposure location, and study animal) or due to the chemical itself. Moreover, it is often unknown how long the temporary and reversible health effects would be expected to last in humans. DEQ and OHA, in consultation with the Technical Advisory Committee, did not apply this category as a parameter for severe health effects because the agencies lacked quantitative information about the length of the reversible effects.

DEQ did not change the proposed rules in response to this comment.

Comment Category #3: Diesel particulate matter should be regulated at a Hazard Index of 3.

Description
Commenters requested that DEQ regulate diesel particulate matter (DPM) at an HI 3. DPM is well studied and has been linked to higher incidences of ADHD, autism, lower school

performance, development of Alzheimer's disease, respiratory disease, nervous system effects, low birth weight, and developmental health effects.

Response

DEQ and OHA have found evidence from U.S. EPA that DPM exposure is linked to developmental effects. DEQ has revised the proposed rule in response to this comment to designate DPM to be regulated at an HI of 3.

During rule development, DEQ and OHA consulted the original diesel engine exhaust health assessment, published by the U.S. EPA in 2002. The 2002 health assessment found that diesel exhaust, which includes DPM, did not likely pose a developmental or reproductive hazard (EPA 2002).

However, in responding to this comment, DEQ and OHA consulted EPA's 2019 final Integrated Science Assessment for particulate matter, recently published on-line on Dec. 31, 2019. Diesel particulate matter is a large component of particulate matter (PM), which is regulated in the U.S. under the Clean Air Act. In urban areas of Californian, Colorado, and Arizona, it has been estimated that DPM contributes between 10 and 36 percent of total ambient inventory of PM 2.5 (particles with a diameter of 2.5 micrometers or less) (EPA 2002). The U.S. EPA issues Integrated Science Assessments for the six criteria air pollutants regulated under the Clean Air Act. These Integrated Science Assessments review the state of the science, especially the weight of scientific evidence linking the specific pollutant to human health effects.
The latest final Integrated Science Assessment for PM was released in 2019. The Integrated Science Assessment for PM includes a "body of evidence [that] was supported by decades of research on whole PM exposures (i.e. no defined size fraction), including diesel exhaust, gasoline exhaust, and wood smoke" (EPA 2019). Some developmental studies in the U.S. EPA Integrated Science Assessment specifically focused on DPM (Manners et al. 2014 and Corson et al. 2010). In Manners et al. 2014, a mouse model revealed that prenatal DPM exposure was associated with asthma susceptibility in offspring. Developing asthma as a result of prenatal exposure to DPM is a developmental health effect. More broadly, the U.S. EPA concludes that there is a suggestive causal relationship between PM2.5 exposure and reproductive and developmental effects, and "the strongest effects in the epidemiologic literature come from studies on sperm motility" (EPA 2019 - page 1365).

Due to this additional evidence from the US EPA, and because developmental effects are identified as a severe impact in SB 1541, DEQ proposes to move DPM to the list of chemicals proposed to be regulated at an HI of 3.

DEQ made a change to the proposed rule in response to this comment.

References:

U.S. EPA. Health Assessment Document for Diesel Engine Exhaust. Final 2002. U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington Office, Washington, DC, EPA/600/8-90/057F, 2002.
U.S. EPA. Integrated Science Assessment (ISA) for Particulate Matter. Final Report, 2019. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-19/188, 2019.
Manners, S; Alam, R; Schwartz, DA; Gorska, MM. 2014. A mouse model links asthma susceptibility to prenatal exposure to diesel exhaust. 2014. Journal of Allergy and Clinical Immunology. doi: 10.1016/j.jaci.2013.10.047
Corson, L., Zhu, H., Quan, C. *et al.* 2010. Prenatal allergen and diesel exhaust exposure and their effects on allergy in adult offspring mice. All Asth Clin Immun 6, 7. doi:10.1186/1710-1492-6-7.

Comment Category # 4: Twelve of the 26 air toxic contaminants remaining at a benchmark of HI of 5 are on California's Proposition 65 list, and so should be regulated at an HI of 3.

Description

Acrolein, aniline, dichlorvos (DDVP), diethylene glycol monoethyl ether, 1,2-epoxybutane, hexamethylene-1,6-diisocyanate, 4, 4'-methylenedianilene (and its dichloride), propylene, propylene glycol dinitrate, crystalline silica (respirable), 1,2,3-trichloropropane, and vinyl bromide are the twelve chemicals listed by the commenter as being part of the California Proposition 65 list.

Response

Characteristics of these 12 chemicals do not meet the parameters DEQ used to identify chemicals to be recommended to be regulated at an HI less than 5. California's Proposition 65 list contains chemicals that have either carcinogenic or reproductive health effects, related to their presence in drinking water. Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted as a ballot initiative in November 1986. The proposition protects the state's drinking water sources from being contaminated with chemicals known to cause cancer, birth defects or other reproductive harm, and requires businesses to inform Californians about exposures to such chemicals.

The proposed HI rules do not address cancer health effects, but do include consideration of developmental and reproductive effects. DEQ and OHA reviewed the health effect designations for the twelve chemicals in the Proposition 65 list dated January 3, 2020. In all twelve cases, the chemical is either designated as causing cancer, but not reproductive effects (aniline, dichlorvos [DDVP], 4, 4'-methylenedianilene [and its dichloride], crystalline silica [respirable], 1,2,3-trichloropropane, vinyl bromide) or are not part of the Proposition 65 list (acrolein, diethylene glycol monoethyl ether, 1,2-epoxybutane, hexamethylene-1,6-diisocyanate, propylene, propylene glycol dinitrate).

DEQ did not change the proposed rules in response to this comment.

Comment Category # 5: DEQ should consider adding oleum (fuming sulfuric acid), refractory ceramic fibers, silica (crystalline, respirable), diesel particulate matter and sulfuric acid to the list of chemicals proposed to be regulated at an HI of 3 instead of an HI of 5.

Description

Consider adding oleum (fuming sulfuric acid), refractory ceramic fibers, silica (crystalline, respirable), diesel particulate matter and sulfuric acid to the list of chemicals proposed to be regulated at an HI of 3 instead of an HI of 5. These chemicals affect the respiratory system in such a manner that recovery from the related lung damage is not possible.

Response

DEQ and OHA re-reviewed these five chemicals using the four parameters described in our response to Comment Category #1. DEQ and OHA rechecked the authoritative sources (e.g. Agency for Toxic Substances and Disease Registry (ASTDR) and U.S. Environmental Protection Agency (EPA)) for any evidence of developmental or reproductive effects. DEQ and OHA also double checked if there are multiple sensitive target organs and if the chemicals are listed on the U.S. Department of Transportation Inhalation Hazard List.

For refractory ceramic fibers, silica (crystalline, respirable), and sulfuric acid, DEQ and OHA did not uncover any new information that would recommend an adjustment to the HI regulation level based on the criteria for developmental or other severe health effects.

DEQ and OHA found that oleum (fuming sulfuric acid), is listed on the U.S. DOT list. According to ATSDR, oleum is also called fuming sulfuric acid and is a solution of 10-70% sulfur trioxide in sulfuric acid (ATSDR 1998). The U.S. DOT lists “sulfuric acid, fuming with 30 percent or more free sulfur trioxide” as poisonous by inhalation and an inhalation hazard (US DOT). Since Oleum is included on the U.S. DOT list and the percentage of sulfur trioxide in Oleum overlaps between the U.S. DOT and ASTDR definitions, DEQ will add oleum to the list of chemicals proposed to be regulated at an HI of 3. DEQ and OHA also found that diesel particulate matter has developmental effects, and so will be added to the list of HI3 chemicals. Please see the detailed response to Comment Category #3 for the information that was used to make this decision.

DEQ made a change to the rule in response to this comment.

References:

Agency for Toxic Substances and Disease Registry (ATSDR). 1998. Toxicological profile for Sulfur Trioxide and Sulfuric Acid. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.
U.S. Department of Transportation. 2020 (current as of Jan. 24th). Code of Federal Regulations, Title 49, Subtitle B, Chapter I, Subchapter C, Part 172, Subpart B, §172.101 Hazardous Materials Table.

Comment Category #6: DEQ should regulate five toxic air contaminants at an HI of 5 rather than an HI of 3 (xylenes [mixture], 1,3-butadiene, methylene diphenyl diisocyanate [MDI], toluene diisocyanate [TDI], and formaldehyde) because they do not have developmental or reproductive effects.

Description

Five of the toxic air contaminants currently proposed for regulation at an HI of 3 should instead be regulated at an HI of 5, including xylenes [mixture], 1,3-butadiene, methylene diphenyl diisocyanate [MDI], toluene diisocyanate [TDI], and formaldehyde. Scientific studies (from sources not considered authoritative in existing CAO program rules) indicates that these chemicals do not have developmental or reproductive effects (complete comment letters in Attachment D, Comments #199 - #202).

Response

To assess the presence of developmental or reproductive impacts, DEQ and OHA considered information from authoritative sources identified in OAR 340-245-0300. These sources carry out and periodically update comprehensive reviews of the available science to evaluate the overall weight of scientific evidence, and are the sources DEQ and OHA use to determine Toxicity Reference Values. The legislature did not authorize sufficient resources for DEQ and OHA to independently evaluate the complete universe of toxicological information available for each chemical, so the agencies must depend on these authoritative, peer-reviewed toxicology sources (including ATSDR and EPA). Comment Categories #12, #23, and #24 provide additional context on why DEQ and OHA rely on these sources rather than individual research studies. If DEQ and OHA are to consider individual sources of toxicological information, as the commenters request, the agencies would need to complete a comprehensive review of all the published studies available. This is in fact what the authoritative sources have completed. As new information evolves, DEQ and OHA will consider updated information from authoritative sources during the triennial reviews of TRVs required by Cleaner Air Oregon program rules.

In evaluating information summarized by authoritative sources, DEQ and OHA used criteria that were vetted by a technical advisory committee. Five out of seven of the committee members agreed with the criteria that DEQ and OHA used.

DEQ did not change the proposed rules in response to this comment.

Comment Category #7: Both ATSDR and OEHHA ignored scientific evidence which supported a threshold for adverse effects related to formaldehyde exposure when they established their protective toxicity reference values.

Description

The CAO program chose a toxicity reference value for formaldehyde from California's Office of Environmental Health Hazard Assessment (OEHHA), which is one of the program's recognized authoritative sources, as is the Agency for Toxic Substances and Disease Registry (ATSDR). However, neither of these authoritative sources acknowledge available evidence which indicates

that there is a toxicological threshold for adverse effects from formaldehyde exposure. Please find complete comment letters in Attachment D, Comment #201.

Response
DEQ and OHA followed up with the commenter and confirmed that this comment was referencing thresholds for cancer effects. For establishing noncancer toxicity reference value, ATSDR and OEHHA used thresholds (i.e., lowest-observable-adverse effect level and no-observable-adverse effect level, respectively). For this rulemaking, we are only focused on noncancer risk assessment and health outcomes. Therefore, this comment pertaining to cancer risk assessment is outside the scope of this rulemaking.

DEQ did not change the proposed rules in response to this comment.

Comment Category #8: The 182 chemicals that cause noncancer health effects should be regulated at a Hazard Index of 1, which is the level that is protective of human health.

Description
Commenter felt that Cleaner Air Oregon rules were weakened by SB1541 and that some interested parties and some CAO rules advisory committee members recommended regulating chemicals with noncancer effects at an HI of 1.

Response
DEQ acknowledges that several interested parties and some members of the RAC recommended that noncancer risks for existing facilities be set at an HI of 1. However, Senate Bill 1541 does not allow regulation of chemicals with noncancer effects at an HI lower than 3.

DEQ did not change the proposed rules in response to this comment.

Comment Category #9: The 182 chemicals that cause noncancer health effects should be regulated at a Hazard Index of zero (0).

Description
All people have a right to breathe clean air, and a definition of ”clean” would mean Health Index Zero.

Response
Senate Bill 1541 does not allow regulation of chemicals with noncancer effects at an HI lower than 3.

DEQ did not change the proposed rules in response to this comment.

Comment Category #10: Use California’s protective level for diesel particulate matter of 3.3 nanograms per cubic meter as a toxicity reference value.

Description
DEQ should use the toxicity reference value that is used by California and Washington of 3.3 nanograms per cubic meter for diesel particulate matter (DPM) instead of the established value in the CAO rules.

Response
The value cited of 3.3 nanograms per cubic meter (ng/m^3) is cancer-based, and therefore out of scope for this HI rulemaking, which only evaluates noncancer health effects for existing facilities.

DEQ did not change the proposed rules in response to this comment.

Comment Category #11: DEQ should do a better job of protecting Oregonians already suffering from poor health. Poor communities and communities of color suffer disproportionate impacts from exposure to toxic air contaminants.

Description
DEQ should better protect the public health of Oregonians, particularly those who already have existing health conditions and/or live within areas of known poor air quality. In these cases, poor communities and communities of color are disproportionately affected.

Response
DEQ acknowledges that low-income households, communities of color and other underrepresented communities are disproportionately and adversely affected by environmental pollution.

DEQ did not change the proposed rules in response to this comment.

Comment Category #12: DEQ should evaluate toxicity information from additional authoritative and other scientific sources to identify noncancer human health effects, and not limit evaluation to CAO-specified authoritative sources, which in many instances contain outdated information.

Description
Same as Comment Category name.

Response
The authoritative sources established in existing rules use a robust, transparent, and peer-reviewed process to evaluate, synthesize and summarize information about the health effects and toxicity of toxic air contaminants after reviewing available research studies and making conclusions based on the weight of scientific evidence. To help clarify which toxic air contaminants are expected to have developmental, reproductive, or other health effects, OHA

and DEQ developed a spreadsheet called the Target Organ Spreadsheet. The TOS describes which organs or organ systems are potentially affected by each toxic air contaminant.

CAO proposed rules specify that DEQ and OHA will review TRVs and RBCs every three years. The intention of that triennial review is for CAO to adopt the most recently updated TRVs from authoritative sources as established in rule.

DEQ did not change the proposed rules in response to this comment.

Comment Category 13: Respiratory health effects should be considered to be severe health effects.

Description
Same as Comment Category name.

Response
In considering this comment and in light of suggestions made by the Rules Advisory Committee, DEQ and OHA proposed that chemicals identified by the U.S. Department of Transportation list of chemicals as posing "inhalation hazards" represent other severe human health effects. This U.S. DOT list contains chemicals which are inhalation hazards under Hazard Classes 2.3 and 6.1, and are "known to be so toxic to humans as to pose a hazard to health during transportation" (49 CFR 173.115) via volatilization, aerosolization, or particulate dispersion. The selection of the list of chemicals posing respiratory health effects was established through evaluation of the established authoritative sources.

DEQ did not change the proposed rules in response to this comment.

Comment Category #14: DEQ should use the Precautionary Principle and regulate the 182 noncancer chemicals at the most protective Hazard Index value that is legally allowable.

Description
The agency is responsible for applying it to benefit of the people of Oregon, and allowing a HI of 5 does not take into account the precautionary principle.

Response
Senate Bill 1541 established specific characteristics that could be considered when the EQC identifies which contaminants could be assessed at a benchmark lower than 5. However, the CAO rules include several elements, consistent with SB 1541 and the EQC's authority that account for uncertainty and incorporate cautious, health- protective assumptions. The risk assessment process also makes several health-protective assumptions. For example, DEQ assumes that children may be present in all residences.

DEQ did not change the proposed rules in response to this comment.

Comment Category #15: The 24-hour comment period allows DEQ to give the appearance of providing an open comment period when in reality it is designed to severely limit input by Oregon's citizenry.

Description
Same as Comment Category name.

Response
The comment period ran for 55 days.

DEQ did not change the proposed rules in response to this comment.

Comment Category #16: The proposed HI rules should take into account endocrine-disrupting chemicals by regulating them at HI3.

Description
Same as Comment Category name.

Response
OHA and DEQ agree that some toxic air contaminants that will be regulated under the proposed HI rules may have endocrine-disrupting effects and as such have potential to cause reproductive and developmental health effects. The proposed HI rules identify those contaminants that have developmental or reproductive effects, and so are likely to encompass indirect consideration of endocrine-disrupting chemicals. Additionally, most chemicals have never been tested for potential endocrine disrupting effects.

To the extent possible with existing data, the CAO program is designed to prevent the most sensitive health effects from occurring in sensitive populations. For some chemicals, CAO based the choice of TRVs on endocrine effects or reproductive and developmental effects that may be caused by endocrine disruption. As federal and state agencies continue to learn from ongoing and new scientific research, this new science may be incorporated into CAO. The CAO rules provide for triennial reviews for TRVs and RBCs.

DEQ did not change the proposed rules in response to this comment.

Comment Category # 17: SB 1541 requires a source-specific approach for HI adjustment based on established regulatory standards and criteria, and does not authorize the EQC to adopt rules that automatically reduce benchmarks for all sources.

Description
The authority for the Hazard Index rulemaking is established in Section 7 of Senate Bill 1541. That portion of the statute outlines a specific process and sets requirements for any rulemaking that allows for adjusting benchmarks. SB 1541 establishes the following framework to which both the EQC and DEQ are bound, for the Hazard Index 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 that establish specific standards and criteria that DEQ may use to adjust the benchmark applicable to a specific source.

Response

The proposed HI rules follow the direction and requirements in SB 1541 to establish how benchmarks will apply to each individual air contamination source. First, proposed rules identify those contaminants that are expected to have developmental or other severe human health effects, as required under Section 7(1) and (3)(a) of SB 1541. The bill gave the EQC authority to identify all toxic air contaminants that will cause developmental or other severe health effects.

Second, the proposed rules establish standards and criteria to determine the degree to which an individual air contamination source's benchmark of excess noncancer risk will be adjusted, based on source-specific information. Specifically, the effective benchmark that will be applied to an individual air contamination source depends on the particular contaminants emitted by the source, and whether they are assigned as HI 5 or HI 3. Sources that emit a mix of contaminants assigned HI 5 and HI 3 are effectively subject to a type of overall average HI number between 5 and 3, and specifically calculated for each source using a Risk Determination Ratio

Source-specific emissions inventory results have been submitted to DEQ as a part of the CAO program, and are/will be incorporated into any risk assessment process. If these emissions inventory results contain toxic air contaminants proposed for regulation under the HI rules, then in addition to other site-specific criteria, a source-specific Risk Determination Ratio can be calculated for a particular facility that integrates a mix of chemicals regulated at HI 3 and at HI 5. As with any risk assessment process, facility-specific exposure considerations can be integrated into the related risk calculations, further providing source-specific information.

DEQ did not change the proposed rules in response to this comment.

Comment Category #18: SB 1541 requires a source-specific analysis of emissions.

Description

DEQ must determine whether a 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. If, and only if, DEQ makes that source-specific finding, may the agency then move to the second stage of the assessment, to determine whether it is appropriate to adjust the benchmark for that specific source. A critical aspect of the statute is that DEQ must individually assess a source to determine whether it is necessary and appropriate to reduce the benchmark in that specific case. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response

Please see the DEQ response to Comment Category #17. The proposed rules establish the standards and criteria for DEQ to determine the degree to which it adjusts the benchmark that applies to a specific source in proposed OAR 340-245-0320, through the source-specific

calculation and application of the Risk Determination Ratio. The Risk Determination Ratio inherently incorporates the materiality of a specific source's unique contaminant emissions and the appropriate source-specific application of an adjusted benchmark, based on each source's unique mix of contaminant emissions.

Consistent with requirements established in Section 3 of SB 1541 for an individual air contamination source program, and adopted rules, each individual air contamination source undergoes a site-specific assessment of risks that considers specific meteorological conditions, locations of adjacent residences, schools and workers, and locations of specific emissions sources, in addition to other factors.

DEQ did not change the proposed rules in response to this comment.

Comment Category #19: SB 1541 requires a chemical-specific analysis.

Description

DEQ should provide scientific evidence for each individual substance for this rulemaking, and DEQ should assess how each chemical would be "expected to have" a developmental or other severe health effect when emitted from a particular source in the absence of reducing the HI benchmark from a 5 to a 3. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response

While an exhaustive and systematic review of the toxicological literature for each regulated chemical would be the most scientifically rigorous approach, it would require more resources than SB 1541 allocated to DEQ or OHA for the entire CAO program, which is discussed in detail in Comment Category #24. Better-resourced agencies are already reviewing chemicals using systematic, transparent, and scientifically rigorous methods. DEQ and OHA use those other authoritative agencies for their chemical specific reviews. For DEQ or OHA to engage in the same level of review would be a considerable cost and would be duplicative of work already done by the agencies (such as ATSDR and EPA) that DEQ and OHA recognize as authoritative, and that the EQC has approved as such in OAR 340-253-0300.

In consultation with the HI Technical Advisory Committee and the Rules Advisory Committee, DEQ has identified chemicals for EQC consideration that are expected to have (a) developmental human health effects associated with prenatal or postnatal exposure or (b) other severe human health effects (SB 1541 Section 7(1)(a) and (b)), using CAO-designated authoritative sources and the Target Organ Spreadsheet first mentioned under Comment Category #12. Each facility (i.e. source) under the CAO program emits a unique mixture of chemicals. If a specific chemical is expected to have developmental or other severe human health effects, then DEQ is proposing that an HI 3 benchmark would apply to the emissions of those chemicals as part of that facility's source-specific calculation and application of the Risk Determination Ratio.

DEQ did not change the proposed rules in response to this comment.

Comment Category #20: SB 1541 does not authorize reducing the benchmark unless the RBC is based on developmental impacts.

Description

Same as Comment Category name. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response

SB 1541 does not mention TRVs or RBCs. Additionally, SB 1541 does not state that developmental effects have to be the most sensitive health outcome for the HI benchmark to be lowered. Rather, SB 1541 requires DEQ to identify contaminants to be regulated at an HI other than 5 if they are expected to have (a) developmental human health effects associated with prenatal or postnatal exposure or (b) other severe human health effects (Section 7(1)(a) and (b)).

A majority of HI Technical Advisory Committee members advised that if there is evidence that a contaminant causes developmental or reproductive health effects at any dose, then it should be designated as having developmental impacts, even if the contaminant also causes other health effects at lower doses. DEQ and OHA agree with this majority opinion of the Technical Advisory Committee because noncancer TRVs and RBCs in CAO are set to be protective of health assuming HI numbers of 1 or less. If toxic air contaminants were regulated at an HI of 1, DEQ could be certain that there would not be a risk of developmental or reproductive effects. However, SB 1541 set the regulatory benchmark at an HI of 5, except in cases where an HI of 3 can be used.

Developmental or reproductive effects can occur at concentrations higher than those that cause health effects in a more sensitive target organ system. For some toxic air contaminants, there may be a wide margin between the concentrations that cause the most sensitive health effect and concentrations that cause developmental or reproductive effects, but for other toxic air contaminants there may be a very small margin between those concentrations. There is not always data available on those concentration level differences. Because SB 1541 requires DEQ to regulate at an HI of 5 (or 3) instead of 1, there is potential for the concentration of a toxic air contaminant to be above both the level that could cause health effects in the most sensitive organ and the level that could cause developmental or reproductive health effects. DEQ therefore recommends to the EQC that all chemicals that cause developmental or reproductive effects be regulated at an HI of 3, notwithstanding that these effects may not occur at concentrations that cause the most sensitive impact. SB 1541 requires DEQ to identify which chemicals have developmental impacts, not a subset of chemicals for which developmental impacts are the most sensitive impact.

DEQ did not change the proposed rules in response to this comment.

Comment Category #21: SB 1541 does not extend to reproductive effects.

Description

The proposed rules inappropriately assume that the reference to developmental impacts in SB1541 included reproductive effects. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response

SB 1541 states that the EQC can assign an HI other than 5 (but not lower than 3) as the Risk Action Level applicable to existing facilities for toxic air contaminants identified as having "developmental human health effects associated with prenatal or postnatal exposure" or "other severe human health effects" (Section 7(1)(a) and (b)). DEQ and OHA are classifying reproductive health effects as other severe health effects.

The statute establishes that developmental health effects are a severe health effect. During the HI Technical Advisory Committee meetings, five of the seven committee members agreed that developmental and reproductive effects are difficult to separate. Reproductive effects can impact developing children post-birth and into early life. Environmental exposures to both male and female parents prior to conception can lead to adverse outcomes in future offspring (Braun 2017). Preconception chemical exposure is within the prenatal exposure window, which links reproductive effects with developmental effects.

In addition, the US EPA's Guidelines for Developmental Toxicity Risk Assessment state: *"Developmental toxicity can be considered a component of reproductive toxicity, and often it is difficult to distinguish between effects mediated through the parents versus direct interaction with developmental processes. For example, developmental toxicity may be influenced by the effects of the toxic agents on the maternal system when exposure occurs during pregnancy or lactation. In addition, following parental exposure prior to conception, developmental toxicity may result in their offspring and, potentially, in subsequent generations"* (US EPA 1991). Developmental human health effects are specifically called out and prioritized in Senate Bill 1541 Section 7(1)(a) by the Oregon Legislature, and because reproductive human health effects are closely related to developmental health effects, DEQ is proposing reproductive effects be classified as other severe human health effects.

DEQ did not change the proposed rules in response to this comment.

References

Joseph M. Braun, Carmen Messerlian, and Russ Hauser. Fathers Matter: Why It's Time to Consider the Impact of Paternal Environmental Exposures on Children's Health. Curr Epidemiol Rep. 2017 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5571868/

Guidelines for Developmental Toxicity Risk Assessment. Risk Assessment Forum. U.S. Environmental Protection Agency. Dec. 5, 1991, pg. 4. https://www.epa.gov/sites/production/files/2014-11/documents/dev_tox.pdf

Comment Category #22: Impacts on multiple target organs do not justify a benchmark reduction.

Description

DEQ's Notice of Proposed Rulemaking states that 63 chemicals are proposed to have their benchmarks reduced from 5 to 3 based on the chemical's TRV being based on effects to more than one target organ. SB 1541 clearly states the basis for a benchmark reduction as being either a demonstration of developmental human health effects or other severe human health effects. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response

The Technical Advisory Committee opted not to define what constitutes a severe health effect, and considered it a non-scientific, policy-based decision.

DEQ and OHA therefore explored the question with the Rules Advisory Committee. In considering what might separate a "severe" impact (discussed in Section 7 of SB 1541) from a "serious" impact (discussed in Section 2 of SB 1541), one of those suggestions was that if a chemical's toxicity reference value is applicable to more than one type of target organ, then that chemical would be considered to have more deleterious impacts than one that only affects one organ system and could therefore be considered to cause severe health effects. DEQ and OHA agreed that this was an appropriate differentiator.

DEQ did not change the proposed rules in response to this comment.

Comment Category #23: The proposed rules must consider the most current science.

Description

The proposed rules do not consider the most current science, and DEQ relies on out-of-date assessments. DEQ should not proceed with this rulemaking except where a change in the benchmark is justified by the best, most current science. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response

DEQ and OHA agree that the goal is for CAO to be based on the most current scientific information available, however as previously discussed, we rely on authoritative sources that complete exhaustive peer-review processes prior to publication of recommended values. This process requires the evaluation of multiple studies. With the accumulation of multiple individual studies addressing the same questions over time, this process allows scientists to evaluate the overall weight of scientific evidence on a given topic.

The authoritative bodies named in the CAO rules are examples of government agencies that collect and evaluate the overall weight of scientific evidence. Agencies like the U.S. Agency for Toxic Substances and Disease Registry and the U.S. Environmental Protection Agency have the resources and expertise to evaluate the quality and degree of consensus among hundreds of individually published studies to determine the overall weight of evidence and degree of

consensus among scientists working in the relevant field. Comment Category #24 provides context on the amount of resources it requires to complete an environmental health risk assessment. Therefore, DEQ and OHA rely on other authoritative bodies to evaluate the latest scientific evidence that is supported by an adequate degree of consensus among the scientific community. DEQ and OHA will evaluate updates to available research as part of the triennial review process established in the CAO rules.

DEQ did not change the proposed rules in response to this comment.

Comment Category #24: The Technical Advisory Committee process was inadequate.

Description
The Technical Advisory Committee process was inadequate; the Committee should have reviewed the specific toxicity of each chemical under consideration using the best available science, and been given more time to do so. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response
DEQ disagrees with this comment. SB 1541 requires that the Commission establish and consider the recommendations of an advisory committee that includes "persons with technical expertise in toxic air contaminant risk assessment." In compliance with that requirement, DEQ established the Technical Advisory Committee (TAC) on a volunteer basis and provided the committee with substantial analyses of each chemical as outlined by each authoritative source. DEQ considers it inappropriate to task the voluntary members of such a committee, and staff resources, to complete a comprehensive review of all the literature extant related to an individual chemical's toxicity, when such work had already been completed by authoritative sources. Even extracting the toxicological information summarized by the authoritative sources required hundreds of hours of the agencies' staff time. For example, Oregon DEQ and OHA toxicologists compiled data from the authoritative sources for CAO in preparation for this rulemaking, which included 51,000 pieces of information and took 800 to 1,000 hours of staff time. The reviews conducted by these authoritative sources involved the kind of thorough and chemical-specific toxicity review using the best available science suggested by this commenter. For DEQ and OHA to replicate such an exhaustive review would likely have required thousands of hours, and several years to complete, and ultimately would have been duplicative of the work that the authoritative sources had already completed.

DEQ did not change the proposed rules in response to this comment.

References

Michelson, M., & Reuter, K. 2019. The significant cost of systematic reviews and meta-analyses: A call for greater involvement of machine learning to assess the promise of clinical trials. Contemporary clinical trials communications, 100443.

Borah R, Brown AW, Capers PL, et al. 2017. Analysis of the time and workers needed to conduct systematic reviews of medical interventions using data from the PROSPERO registry. BMJ Open; 7: e012545. doi: 10.1136/bmjopen-2016-012545.

Comment Category #25: The risk determination ratio approach is sound.

Description
Commenter noted support of the practical approach used by DEQ for weighting impacts for a facility that emits toxics that are subject to more than one benchmark. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response
Comment noted.

DEQ did not change the proposed rules in response to this comment.

Comment Category #26: Chemicals with established RBCs already have applied conservative assumptions in those values. Therefore, no reduction of hazard index is merited.

Description
Risk based concentrations (RBCs) are overly conservative due to uncertainty factors and, therefore, an HI of 5 avoids health risks. Where a chemical that reflects highly protective assumptions, then that chemical cannot be expected to have the severe effects that merit a reduction in the benchmark. For the original comment letter in its entirety, please see Comment #193 in Attachment D.

Response
RBCs incorporate conservative assumptions to ensure that they reflect chemical levels that are not expected to harm health. However, DEQ and OHA do not agree that RBCs are overly conservative to the extent that an HI of 5 avoids health risks.

The presence of uncertainty factors (UFs) does not mean that toxicity reference values, or risk based concentrations, are overly conservative. UFs are used for specific purposes when calculating toxicity reference values from experimental data. For example, if a toxicity value is calculated from a study on mice, a UF can be applied to account for uncertainty in extrapolating toxicity results from a rodent to a human. UFs can be applied to account for a variety of factors, such as uncertainty arising from (1) the variation in sensitivity among the members of the human population, (2) the extrapolation of animal data to humans, (3) the lack of a no observed adverse effect level, and (4) insufficient information on sensitive health endpoints. The UFs integrated into TRVs and RBCs serve an evidence-based purpose. The use of an uncertainty factor itself does not guarantee that the final value is protective, but makes it more likely to be.

In the comment letter it is stated: “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 chemicals benchmark should not be reduced.” DEQ notes that TRVs and RBCs are calculated to be protective of health at an HI of 1 -- not 5. If toxic air contaminants were

regulated at an HI of 1, DEQ and OHA could be much more certain that there would not be a risk of developmental or reproductive effects.

DEQ did not change the proposed rules in response to this comment.

Comment Category #27: DEQ should consider the relative protectiveness of HI 3 and HI 5 when a toxic air contaminant has both developmental effects and a toxicity reference value based on a different target organ.

Description
Same as Comment Category. Please find complete comment text in Attachment D, Comment #192.

Response
To estimate noncancer risk, DEQ is using the TRV based on the health endpoint expected to occur at the lowest concentration (i.e. most sensitive). DEQ uses these TRVs from our authoritative sources, such as the U.S. EPA and ATSDR. Regulating noncancer risk at an HI of 3 is more health protective than an HI of 5. As discussed in comment #20, this will remain the applicable TRV, although the presence of developmental impacts may occur at a lower dose. Such chemicals are proposed to be regulated at a benchmark of HI 3. Also, please see our response to Comment #20.

DEQ did not make a change to the rules in response to this comment.

Comment Category #28: DEQ has incorrectly implemented SB 1541 in their proposed HI rules.

Description
Same as Comment Category name. Please find complete comment text in Attachment D, Comment 198.

Response
Based on consultation with the Oregon Department of Justice and on multiple internal discussions on this topic, DEQ concludes that its proposed Hazard Index rules are consistent with Senate Bill 1541. DEQ's interpretation, as presented in the proposed HI rules, and informed by the Rules Advisory Committee, addresses the directives in Senate Bill 1451.

DEQ acknowledges that some interpretation of SB 1541 was required in order to establish clear implementing rules. Specifically, determining what constituted a "severe" health impact was the subject of extensive discussion and debate at both the Technical and Rules Advisory committee meetings. DEQ and OHA appreciate the time and valuable input both bodies provided in order to arrive at appropriate approaches that are now proposed for rulemaking.

Regarding the Hazard Index rule making, SB 1541 provided direction to the EQC to adjust the standard health benchmarks for existing sources to account for the presence of emissions expected to result in "developmental human health effects associated with prenatal or postnatal exposure; or other severe human health effects." Consistent with the statute, DEQ convened a Technical Advisory Committee to advise the agency, as well as a Rules Advisory Committee. DEQ carefully considered the input from both of these committees and incorporated much of their advice into the proposed rules.

The proposed criteria for adjusting pollutant-specific regulatory thresholds below a Hazard Index of 5 include contaminants expected to have developmental effects and contaminants expected to have other severe human health effects. Determining what effects are severe was a major area of focus for the advisory committees. The draft rules define severe impacts as those expected to have reproductive health effects, those affecting multiple target organ systems, and those identified as inhalation hazards by the US Department of Transportation. The draft rules also specify which pollutants meet those criteria based on authoritative sources -- the US EPA's Integrated Risk Information System, and the Agency for Toxic Substances and Disease Registry.

The draft rules also include a proposed process for the agency to apply adjustments to the Hazard Index to individual sources. By its nature, the Cleaner Air Oregon program is designed to result in source-specific consideration of the unique features of each individual source, including the unique mix and amounts of toxic air contaminants emitted, the location of emission points, production schedules, existing emission control systems, local meteorology and emissions impacts where people live, work and congregate.

DEQ did not change the proposed rules in response to this comment.

Comment Category #29: DEQ has incorrectly categorized four toxic air contaminants as not being carcinogens.

Description

There are errors in DEQ's categorization of chemicals as non-cancer causing when the evidence for their potential to cause cancer is well documented. For example, from the list of 26 toxic air contaminants that DEQ does not expect to have developmental or other severe health effects:

- acrolein is a bladder and lung carcinogen,[1]
- crystalline silica is a known human carcinogen,[2]
- strong acid mists containing sulfuric acid (including Oleum, fuming sulfuric acid) are carcinogenic,[3] and
- vinyl bromide is classified by the EPA as a probable human carcinogen.4
- Bromide is classified by the EPA as a probable human carcinogen.[4]

    - 1 Moon-shong Tang, Hsiang-tsui Wang, et al. 2011. Acrolein induced DNA damage, mutagenicity and effect on DNA repair. MolNutr Food Res. 55(9): 1291–1300.

- 2 National Toxicology Program. Silica, Crystalline (Respirable Size), Report on Carcinogens, 14th Edition. Research Triangle Park, NC: National Institute of Environmental Health Sciences, 2016.
- 3 Toxnet, HSDB Database. Oleum CASRN 8014-95-7 https://toxnet.nlm.nih.gov/cgibin/sis/search/a?dbs+hsdb:@term+@DOCNO+1236 4 https://www.epa.gov/sites/production/files/2016-09/documents/vinyl-bromide.pdf

Response

The proposed HI rules apply only to noncancer health effects, and so discussion of toxic air contaminants having cancer effects is outside of the scope of this HI rulemaking.

DEQ did not change the proposed rules in response to this comment.

Comment Category #30: Provide a simpler explanation of what the proposed HI rules will change.

Description

Commenter would like a simpler explanation of what will change if the proposed HI rules are adopted.

Response

The original CAO rules set the benchmark for 182 chemicals with noncancer effects that are emitted by existing facilities at a Hazard Index of 5. These proposed HI rules will regulate a subset of the 182 chemicals that are expected to have developmental or other severe health effects at a more stringent limit of a Hazard Index of 3.

DEQ did not change the proposed rules in response to this comment.

Comment Category #31: Comments received outside the scope of the proposed rules.

Description

DEQ and OHA received many comments that are outside the scope of the Hazard Index rules. For example, some of these comments included but are not limited to:

- Has the smoke from Kerosene heaters been considered and/or regulated? It has an offensive smell and must have dangerous chemicals in it. (Comment # 144).
- All emissions from oil re-refiners should be included. (Comment #69).
- Stop allowing industries, including woodsmoke from restaurants, to operate without proper air cleaning systems. The air in Portland literally stinks. (Comment #64).
- We need to look at real data rather than "modeling" of data. We now have more air data sensors in private hands. Multnomah County staff are using flawed science when they could use much more accurate data. Even when yellow air days are announced, there is

no binding change. For Portland data, Multnomah County uses single sensor at SE 54th and LaFayette Ave. They also use "modeling" and 4 suburban sensors. (Comment # 164).

- Odors from the Swan Island area smell terrible, and need to be controlled. (Comment numbers 4, 57, 73, 167, 177).

Response

These comments are noted. The proposed HI rules pertain to noncancer toxic air contaminants emitted from existing industrial sources only.

DEQ did not change the proposed rules in response to this comment.

Record of Public Comment Submittals for Hazard Index Rulemaking

DEQ solicited public comments on the draft Cleaner Air Oregon Hazard Index rules and fiscal impacts during one public comment period running from Oct. 25, 2019 to Nov. 22, 2019. The closing date of the public comment period was extended to 4 p.m. on Dec. 18, 2019, based on a request from a concerned outside commenter. The list of comments and responses below contains all comments received during the comment period, including those submitted via email, on paper, and in the form of oral statements at a public hearing. DEQ reviewed each comment and responded to that comment individually, or referred back to a previous relevant response in cases where the same comment was submitted multiple times.

In cases where multiple commenters submitted the same comment, we responded to that comment once, and did not keep repeating the comment for each commenter that submitted it. Therefore, in some cases, you may not see your name as a separate commenter. In other cases where a commenter submitted text in addition to a comment that appeared multiple times, that additional text was left in place.

Grammatical or spelling errors present in any original comment submittal were not corrected by agency staff, and so will appear in some of the comments below. In addition, any comments received after 4 p.m. on Dec. 18, 2019, were late in being submitted and so will not be addressed here.

Please refer to Attachment C for responses to each of the comment submittals listed below. Responses appear in 31 different Comment Categories in Attachment C.

Comment Submittal #1

Name: Kiel Johnson

Comment text:
Please consider the following when making the public health standards for Senate Bill 1541.

1. It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term nuerodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzeihmers.

Comment categories linked to this comment: 1, 3, 8

Comment #2

Name: Jenny Pompilio

Comment text:
As a physician and public health advocate, I thank you for working to make Oregon's air safer for everyone to breath, especially those most vulnerable to toxic emissions. Using a HI 3 is not an exceptionally aggressive standard but is an improvement since a HI 5 is not really a protective standard at all.

Please act with caution (using the Precautionary Principle and primum non nocere), and move all identified toxic air contaminants to the most health protective standard legally possible at this time: HI3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This is unacceptable since emerging research demonstrates the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Please do all you can to protect Oregonians, especially communities of color, the poor, the very young and the very old who suffer the most from poor AQ.
Thank you,
Jenny Pompilio MD, MPH
Comment categories linked to this comment: 1, 3, 14

Comment #3
Name: Chris Streight

Comment text:
We need stricter standards on air quality

1. HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3, 8

Comment #4
Name: Janie Lundin-Ledgerwood

Comment text:
Do more than the bare minimum, please!

1. It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3,
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be move to the more health protective standard of HI3 is Diesel Particulate Matter (DPM), This flies in the face of all emerging

science and research that demonstrate with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Excuse me?!!! I live above Swan Island in North Portland and our home and children's school are in direct wind patterns of the Island and I-5 corridor, which is laden with DPM!
My son suffers from ADHD. His case is not hereditary, as far as I know. So it begs the question, is our poor air quality the cause? I am disappointed, bewildered, and frankly angry that the State of Oregon and DEQ are doing such a poor job of protecting all citizens.
Wake up legislators! Shame on you for doing the bare minimum!
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #5

Name: Margaret Malone

Comment text:

1. I'm writing to urge you regulate all air toxics at the most protective level.
2. Note that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
3. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
4. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #6

Name: Hay Family / Lauren Hay

Comment text:

My 7 year old is suffering from reactive airway disease which is aggravated by diesel particulate matter. It is so important for our family, and all people to have clean air. Please increase the standard, our lives depend on it.

1. It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #7
Name: Bjorn Sorenson

Comment text:
As a resident of Portland and a close neighbor to Precision Castparts Corporation, I attended a meeting about local air quality and was appalled to learn not only how many violations the company has had, but more importantly, how much pollution they were permitted to emit. It is my understanding that you are accepting public commentary now with regards to new hazard index rules, and my sentiments echo that of the organization Neighbors for Clean Air:

1. It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency (DEQ) should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

It is your job to protect the environmental quality of Portland for the people who live here. Please use your power to improve the environmental quality of our city for its residents by enacting stricter standards.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #8
Name: Mark Colman

Comment text:

1. It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #9
Name: William Crawford

Comment text:
Keep health standards as high as possible. There is no reason to lower our standards for the special interests of the polluting industries. I am again ashamed our state is so behind the times. Keep us healthy. Keep our air clean!

HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.

DEQ should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible

Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM.

Please keep the health of your citizens in mind.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #10
Name: Dale Feik

Comment text:
I agree with Tori Cole, Neighbor for Clean Air representative:

1. HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.

2. DEQ/EQC should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3

3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long-term neurodevelopmental health impacts from exposure to DPM.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #11
Name: Ellen Saunders

Comment text:
Portland air a toxic problem.
During a OHSU trauma hospital stay in June 2017 I was wheeled out on the deck for some fresh air. Fresh air was not what I got. The June air was unbreathable with heavy toxic smog. Portland air shed is being poisoned. Portland is becoming unlivable due to traffic and commercial air emissions.

I am gravely concerned that the health costs that are rising are due to commercial lobbyists controlling the information allowed to be heard about air pollution.

1. It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3.
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #12

Name: Jason Auer

Comment text:
I am shocked about what is written below! Please protect air quality. I have kids and am truly worried about their health long term living here. This is not ok and a shocking embarrassment for a state and city that is do ahead of the curve on so many things.

DEQ is proposing that 25 toxic air contaminants - including diesel particulate matter remain at 5x the level at which human health is harmed. These proposed health indexes DO NOT put the health of Oregonians first as was promised by Cleaner Air Oregon. Senate Bill 1541 directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. The proposed rules base the Risk Action Levels, or benchmarks, for existing sources emitting these chemicals on a noncancer Hazard Index value of 3, if the chemical is expected to cause developmental or other severe human health effects. Cleaner Air Oregon Hazard Index Talking Points • It could be argued that HI5 is not even a health protective standard at all. • The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3 • Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.
Comment categories linked to this comment: 1, 3

Comment Submittal #13

Name: Kathie Fellows

Comment text:
The Cleaner Air Oregon Hazard Index must hold all toxic contaminants to the lowest, legally possible levels for the health of our community. Industrial sites emitting air pollution greater than the HI of 1 must be held accountable and required to use optimal pollution controls.
Air pollution is unnecessarily costing the public too much in health care. This situation is fixable by your regulation of toxic contaminants in the air.
Please keep the air we breathe clean and safe for all generations to come.
Comment categories linked to this comment: 1, 8

Comment Submittal #14
Name: Peggy Shannon

Comment text:
Health can be harmed at DPM level of HI 1. Please get DEQ to truly protect us and live up to their name. DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #15
Name: Allan Rudwick

Comment text:
Neighbors for Clean Air has pointed out that you are trying to adopt weaker than necessary standards for Air Emission. Please adopt HI1 as the threshold. There are major air quality issues around the area that I live (97212) and I think the fact that we don't even have the expensive monitoring equipment to detect diesel pollutant levels to be amazingly troublesome.

Stop caving in to industry and adopt strict emission standards so that we can protect the health of Oregonians.
Comment categories linked to this comment: 8

Comment Submittal #16
Name: Carroll Johnston

Comment text:
I favor moving as many air toxics as possible to a hazard index of 3 or lower. Given that a hazard index of 1 is the level above which health is affected negatively, I encourage the Department of Environmental Quality to move the limits for all of the air toxics downward to an actually safe level – even if that requires going back to the Legislature.
Comment categories linked to this comment: 1, 8

Comment Submittal #17
Name: Lynx Moss

Comment text:
I would like to write in about the proposed health impacts of the proposed HI rules. Specifically I feel that pollution should be regulated to such an extent that it doesn't allow for any impact to human health, but 5X the limit by which human health is impacted it too high of an allowance. We should not allow polluting industry and commercial activity to poison us and give so little back to the community. Business already doesn't pay its fair share of taxes and barks every time any rules are put in place to make this state more fair, equitable or healthy. Let's not let them get away with polluting us and our children as well! At a very minimum DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxic contaminants at most health protective level legally available: HI 3. HI 1 is much more preferable, with HI 0 being ideal. Tell industry and commerce to actually step up and provide a value to society instead of using us, all while killing us, solely for their own benefit.
Comment categories linked to this comment: 1, 8

Comment Submittal #18

Name: Katherine Gorell

Comment text:
I am writing to express my strong opinion as an Oregon taxpayer, voter, AND PARENT that we need to have cleaner air--and keep polluters from poisoning our communities for profit. We need to have the strictest standards possible--ASAP!!

1. HI1 is the level at which air emissions can harm human health.
2. The agency should move all identified toxic air contaminants to the most health protective standard legally possible: HI3.
3. Diesel Particulate Matter (DPM) is linked to higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #19

Name: Dave and Gay Stuntzner

Comment text:
Senate Bill 1541 directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.
"From the public health standpoint, an industrial site emitting air pollutants with a known Hazard Index greater than 1 without using optimal pollution controls is concerning; operating at a level over 3 is disturbing; allowing a HI of 5 is not defensible from cautious science, from the recommendations from the Technical Advisory Committee (TAC), nor the missions of DEQ, Oregon Health Authority, and the Multnomah County Health Department."

Evidently you are choosing to disregard the health of all Oregonians. Surely your collective consciences will not allow a Hazard Index of 5! Surely not! As is noted, that would be INDEFENSIBLE.
Comment categories linked to this comment: 1, 8

Comment Submittal #20

Name: Ron Stone

Comment text:
I agree with the following statement and think that anything less than what it calls for is unacceptable and criminal.

Here's what the Multnomah County Health Department said:
"From the public health standpoint, an industrial site emitting air pollutants with a known Hazard Index greater than 1 without using optimal pollution controls is concerning; operating at a level over 3 is disturbing; allowing a HI of 5 is not defensible from cautious science, from the recommendations from the Technical Advisory Committee (TAC), nor the missions of DEQ, Oregon Health Authority, and the Multnomah County Health Department."
Comment categories linked to this comment: 1, 8

Comment Submittal #21

Name: Melody Ellis Valdini

Comment text:
I am writing to submit a comment on the Cleaner Air Oregon Hazard Index Rulemaking.

I just heard that the DEQ is setting a new standard on what levels of chemicals can be released into the air. I was confused when I heard this- no way our government is STILL letting industry release a bunch of chemicals into our air. After all, we have the science- we know that these chemicals are bad for us, and especially bad for our kids. But I did my research and wow- it's true. So, even though I have a hundred other things to do, and even though it strikes me as really crazy that I need to take time out of my day to beg the government to please make laws that keep your citizens from getting poisoned, here I am.

So please, DEQ: please follow the recommendation based on science and please do not let industry poison us. From my internet research, it looks like people are begging you to set the "Health Index" maximum at 3. But I'm going to be wildly optimistic and beg you to set it to 2 or below. And yes, I realize this may inconvenience industry, but I'm going to be bold and say that industry inconvenience is preferred to releasing pollutants that cause developmental and reproductive health effects.

Again, please choose to protect your citizens. Yes, we have less money than industry, but that shouldn't mean that we matter less.
Comment categories linked to this comment: 1

Comment Submittal #22
Name: Marjorie MartzEmerson

Comment text:
The *Hazard Index (HI)* is defined as the measure of exposure of man to a pollutant (Q) over an established limit that should not be exceeded because of the health risk to humans (Q_L). This clearly means that a Hazard Index less than or equal to one should be an acceptable health risk and a Hazard Index greater than one allows an exposure that is greater than the limit that should not be exceeded. The established limit that should not be exceed (Q_L) is calculated for each chemical substance based on the toxicity characteristics of that substance.

The Legislature chose, rather than protecting public health, to allow potential exposures that are either three or five times the Hazard Index, neither are protective. This ties the hands of DEQ in setting appropriate exposure limits for protecting public health. This statute needs to be amended in the next legislative session.
Comment categories linked to this comment: 1, 8

Comment Submittal #23
Name: Greg Sotir

Organization: Cully Clean Air Team
Comment text (made at Nov. 11, 2019 rulemaking Hearing):
Please revisit the toxicity for Diesel Particulate Matter and other pollutants listed in the 26 chemicals [which are proposed for regulation using HI 5, rather than HI 3].
Comment categories linked to this comment: 1, 3

Comment Submittal #24
Name: Alexander Macdonald

Comment text:
Please accept my vote to side with human health, and thus economic health for society, instead of favoring select polluting industries that benefit the few. Please treat all air toxics as dangerous at least at a HI3 level and especially diesel particulate.
Comment categories linked to this comment: 1, 3

Comment Submittal #25
Name: Janet Johnson

Comment text:
If the DEQ is REALLY in business of protecting people from harmful toxins they MUST move all identified toxic air contaminants, including DPM, into the HI3 category. It would be insane and criminal to do otherwise. It would signal that the DEQ is working at the bidding of corrupt corporations.
Comment categories linked to this comment: 1, 3

Comment Submittal #26
Name: Juliet Hyams

Comment text:
I wear a scarf most of the year, to cover my nose when trucks pass, or I pass construction. I dread the impending construction across the street from my house, because my children and I will likely be breathing diesel for a year or more. I have asked the developer to use clean construction practices, but they're not obligated to do so.

Please move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3. Both my siblings have had cancer and I don't want to join them in that.
Comment categories linked to this comment: 1

Comment Submittal #27
Name: Courtney Olive

Comment text:
I am an Oregon resident. I ask that DEQ act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3.
Comment categories linked to this comment: 1

Comment Submittal #28
Name: Shawn Ingersoll

Comment text:
I want to show my support behind having real people/environmental based levels when it comes to air pollution. Please regulate all known air toxins at the 'most' protective level.

It is clear that all is not fully understood or known about how certain air pollution impacts humans and the environment we share, both in the short or long term. Simply providing a partial level of protection is not good enough. We have too long approached water, air, and soil pollution backwards. Creating levels that "hopefully are good enough" based on what is known at the time. Instead, if we are going to allow pollution, these pollutants must first be scientifically proven to be indeed safe for humans and the environment, both individually and collectively when accounting for all pollution sources in an area. This is especially true for those at a higher risk of health impacts, who may live, work, play, or attend school in

areas with greater pollution levels (travel corridors, proximity to industrial areas, residential wood smoke etc.).

I urge DEQ to support regulating levels of harmful emissions at proactive standards for the sake of our people, children, communities, and environment. Please regulate at the Most Protective Levels.
Comment categories linked to this comment: 1, 8

Comment Submittal #29
Name: Vicki Simon

Comment text:
Regulate all air toxics at most protective level, as recommended by Cleaner Air Oregon.
Comment categories linked to this comment: 1, 8

Comment Submittal #30
Name: Debra Golden

Comment text:
I am writing to request that the HI levels for air pollutants be set at the HI3 level set by Senate Bill 1541, and in-line with Washington's and California's levels. The HI5 level proposed by DEQ is considered by health professionals to be deleterious to the health of Oregonians.

Please reconsider your proposed toxic air contaminants standards and establish lower HI levels.
Comment categories linked to this comment: 1

Comment Submittal #31
Name: Gitanjali J. Hursh

Comment text:
I was born in Oregon in 1973.
As I've aged my allergies have moved to asthma & breathing our supposed clean air is more difficult.
In terms of environmental standards, Oregon should be an environmental leader not lagging behind.
DEQ should move all identified toxic air contaminants to the most health protective standard legally possible: HI3.
Comment categories linked to this comment: 1

Comment Submittal #32
Name: Pam Howard

Comment text:
As a Senior resident of Multnomah County, I urge you to extend regulation of our Air Quality to all known hazardous substances. All people have a right to breathe clean air, and a definition of ”clean” would mean Health Index Zero. Cancer can be a deadly disease, but there are other equally deadly diseases that can rob a person of good health. Twenty-six known air contaminants are currently unregulated. I urge you to regulate all one hundred and eighty-two chemicals to the strictest HI possible, which is a Health Index of Three. We look to the Department of Air Quality to respond to our call for clean air.
Comment categories linked to this comment: 9

Comment Submittal #33

Name: Dana Mozer

Comment text:
I am a Family Nurse Practitioner and see firsthand the negative health effects of air pollution in my community, especially in children and chronically ill adults. I would like to see the DEQ moving ALL identified air contaminants to the most health protective standard legally possible. Specifically in my community we see a significant problem with diesel particulate matter, which is known to be linked to a higher incidence of ADHD, autism, Alzheimers disease and lower school performance.
Thank you for considering these comments in moving forward, not back, in public health efforts.
Comment categories linked to this comment: 1, 3

Comment Submittal #34

Name: Don Stephens

Comment text:
This is a topic of importance to me as I have been diagnosed by Kaiser Permanente as having impaired lung function (fibrosis).
I feel the DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at the most health protective level legally available: HI 3. If the health of the people is truly the primary consideration, and not corporate profits, it is only reasonable to follow HI 3.

Please consider the following points:

1. HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

The last point re DPM is particularly important considering the already high levels in our urban areas.
Comment categories linked to this comment: 1, 3

Comment Submittal #35

Name: Stephanie Glazer

Comment text:
Please take all possible steps to protect air quality in Oregon. There is no acceptable reason that Oregonians should be subjected to poor air quality, especially when there are technically feasible ways to regulate and eliminate pollutants. DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
Comment categories linked to this comment: 1

Comment Submittal #36
Name: Kenn Fine

Comment text:
Strongly believe the DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
Comment categories linked to this comment: 1

Comment Submittal #37
Name: Terry Jess

Comment text:
I reiterate, “We urge DEQ to remain faithful to its mission to restore, maintain and enhance 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 recommend 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.”

I concur and support the above statements.
Comment categories linked to this comment: 1, 2

Comment Submittal # 38
Name: Maia Gay

Comment text:
"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." Gov. Brown!

“We recommend 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 impact."
Please enforce the regulations.
Comment categories linked to this comment: 1, 2

Comment Submittal #39
Name: Ineke Deruyter

Comment text:
Please accept the recommendations from your Technical Advisory Committee and include all non cancer air toxics contaminants at most health protective level legally available: HI 3.

Breathing clean, unpolluted air is vital to our health.

Unfortunately DEQ is setting limits that will not protect us. I urge you to remain faithful to your mission to restore, maintain and enhance the quality of Oregon's air, land and water, while being guided by the principle of Public Service, Health, Safety and Wellness.

In establishing Cleaner Air Oregon the Governor 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.'

I recommend that a hazard index of no less than 3 be used for any of the regulated air toxics that does not have a temporary and reversible physiological effect and can therefore be regarded as having a severe impact on human health.
Comment categories linked to this comment: 1, 2

Comment Submittal #40
Name: Noah Jenkins

Comment text:
To Whom It May Concern (which is everyone):
I urge DEQ to remain faithful to its mission to restore, maintain and enhance 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 recommend 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."
Oregon's air quality regulations are not getting the job done. Poor communities and communities of color suffer disproportionately from the results, in the form of higher asthma rates and other conditions related to air pollution. This must end.
Comment categories linked to this comment: 1, 2, 11

Comment Submittal #41
Name: Francisco Gadea

Comment text:
The people of Oregon depends on you. Please protect our air!
Clean air is fundamental to good health. A hazard index of no greater than 3 should 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.
Comment categories linked to this comment: 1, 2

Comment Submittal #42
Name: M. Susan Dean

Comment text:
DEQ must remain faithful to its mission to restore, maintain and enhance the quality of Oregon's air, land and water. DEQ shall do this 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.
According to the Multnomah County Health Department, a hazard index (HI) of 5 is indefensible. An HI of no greater than 3 must 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.
Please do the job you were mandated to do and protect all citizens of Oregon.
Comment categories linked to this comment: 1, 2

Comment Submittal #43
Name: Walt Mintkeski

Comment text:
I urge DEQ to remain faithful to its mission to restore, maintain and enhance the quality of Oregon's air, land and water, while being guided by values of public service, health, safety and wellness.
Senate Bill 1541 directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. However DEQ is setting limits that will not do that.
Comment categories linked to this comment: 1, 2

Comment Submittal #44
Name: Lenny Dee

Comment text:
As the Multnomah County Health Department recommended We recommend 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."

1. HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.
2. The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
3. Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

Comment categories linked to this comment: 1, 3

Comment Submittal #45
Name: Pete Schmanski

Comment text:
As per recommendations from Multnomah County Health Dept:
"We recommend 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."
Comment categories linked to this comment: 1, 2

Comment Submittal #46

Name: Rick Ray

Comment text:
Senate Bill 1541 directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. Unfortunately DEQ is setting limits that won't protect us. I urge DEQ to remain faithful to its mission to restore, maintain and enhance the quality of Oregon's air, land and water, while being guided by values of public service, health, safety and wellness.

I recommend 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.
Comment categories linked to this comment: 1, 2

Comment Submittal #47

Name: Charlotte Nuessle

Comment text:
To our Department of Environmental Quality,
We respect the important role you play in safeguarding our well-being.
There is a learning curve for all of us in integrating research, budget and education, all rolled into choices we each make.

We must ask that you safeguard our air quality.
Federal policy is not addressing the impact of industrial air emissions.
We ask that Oregon DEQ declare a Hazard Index of no greater than 3 be used for any regulated air toxics that do not have a temporary and reversible physiological effect. They must be treated as the concern they are of having a severe impact on human health.
Comment categories linked to this comment: 1, 2

Comment Submittal #48

Name: S. Taylor

Comment text:
We urge DEQ to remain faithful to its mission to restore, maintain and enhance 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 recommend 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.
Comment categories linked to this comment: 1, 2

Comment Submittal #49

Name: Craig Mackie

Comment text:
I urge DEQ to remain faithful to its mission to restore, maintain and enhance 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."
I recommend 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."
Comment categories linked to this comment: 1, 2

Comment Submittal #50
Name: Marcia Strickland

Comment text:
It is becoming less and less of a secret that the air quality in Oregon overall, and in Portland where I live is shamefully polluted. The polluted air is potentially sickening all of us, and is definitely sickening our most vulnerable citizens. Public health must be incorporated into all the standards you set for industrial and other air emissions.

It is past time for DEQ to step up to its mission to restore and protect the quality of our air, land and water. As stated by our governor: "We recommend 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."
Comment categories linked to this comment: 1, 2, 11

Comment Submittal #51
Name: Randy Kozar

Comment text:
We urge DEQ to remain faithful to its mission to restore, maintain and enhance 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 recommend 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."
Comment categories linked to this comment: 1, 2

Comment Submittal #52
Name: Nora Mattek

Comment text:
We urge DEQ to remain faithful to its mission to restore, maintain and enhance 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 recommend 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.
Comment categories linked to this comment: 1, 2

Comment Submittal #53
Name: Gillian Leichtling

Comment text:
I am in strong support of the Multnomah County Health Department's statement (below) that DEQ should set a lower Hazard Index standard:
"We urge DEQ to remain faithful to its mission to restore, maintain and enhance 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 recommend 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."
Comment categories linked to this comment: 1, 2

Comment Submittal #54:
Name: Ineke Deruyter

Comment text:
Please accept the recommendations from your Technical Advisory Committee and include all non cancer air toxics contaminants at most health protective level legally available: HI 3
Comment categories linked to this comment: 1

Comment Submittal #55:
Name: Ineke Deruyter

Comment text:
Thank you for the opportunity to comment on the Cleaner Air Oregon rule making relating to the non cancer hazard index thresholds set for toxic air contaminants throughout Oregon.

DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3. All 184 of the Listed Non cancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.
Comment categories linked to this comment: 1

Comment Submittal #56

Name: David Shapiro

Comment text:
DEQ has been directed by the passage of Senate bill 1541 to set health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. I hope DEQ will take this directive seriously and limit toxins to a hazard index of no more than 3, as recommended by experts at the Multnomah County health department.
Comment categories linked to this comment: 1

Comment Submittal #57

Name: Paul Keady

Comment text:
I live in North Portland, and recurring unknown fumes from Swan Island regularly engulf our neighborhood. This unacceptable, and the DEQ's decades of inaction are disgraceful.

The DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
Protect our collective health and the future of our planet. Do not kill the innocent to make profits.
- HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. HI5 is not even a health protective standard at all.
- The agency should move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3
- Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.
- Do the right thing for everyone. Choose public health and our environment over corporate interests.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #58:

Name: Danielle Gillet

Comment text:
Clean air is of the utmost importance and I need you to take action to protect the health of my family, friends, and neighbors here in Portland. I live nearby 99 and the train yards in Brooklyn, and my kids go to school in this highly trafficked zone. We can’t have dirty trucks coming through - please take measures to improve standards for emissions.

Sincerely,
Danielle Gillet

Talking Points
• It could be argued that HI5 is not even a health protective standard at all.
• The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3

• Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term neurodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.
Comment categories linked to this comment: 1, 3

Comment Submittal #59
Name: Marvin Rubenstein

Comment text:
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.

DEQ should accept the recommendation of its Technical Advisory Committee and include all noncancer air toxics contaminants at most health protective level legally available: HI 3.

All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term.

Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts**.**
Comment categories linked to this comment: 1

Comment Submittal #60
Name: Nancy Mogielnicki

Comment text:
Thank you for giving us the opportunity to comment on this air quality issue. We agree with others that DEQ should accept the recommendation of its Technical Advisory Committee and include all noncancer air toxics contaminants at most health protective level legally available: HI 3.
Comment categories linked to this comment: 1

Comment Submittal #61
Name: Liza Dormady

Comment text:
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.
It is frightening that DEQ is considering allowing harmful contaminants at levels higher than HI 3. My seven year old child is a survivor of kidney cancer and her health depends on people like you protecting her air quality, especially for the Portland region where air pollution is more exacerbated.
Comment categories linked to this comment: 1

Comment Submittal #62
Name: David Goodyke

Comment text:
I feel compelled to send you comments to encourage you to rigorously regulate our air to decrease the unacceptable levels off pollution we have. Oregon has embarrassingly bad air quality, and you have an opportunity to begin to address that. DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at the most health protective level legally available: HI 3.All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. Thank you.

The residents of Oregon expect the cleanest air possible, and we expect the DEQ to safeguard our air. \
Comment categories linked to this comment: 1

Comment Submittal #63
Name: K. Schmitt

Comment text:
DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.

Please stand for the health and safety of living beings, not polluters.
Comment categories linked to this comment: 1

Comment Submittal #64
Name: Stephanie McBride

Comment text:
DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxic contaminants at most health protective level legally available: HI 3.
Comment categories linked to this comment: 1

Comment Submittal #65
Name: Joan Rabottini

Comment text:
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.
DEQ should accept the recommendation of its Technical Advisory Committee and include all noncancer air toxics contaminants at most health protective level legally available: HI 3.
All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541.

The bill expressly directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.
Thank you.
Comment categories linked to this comment: 1

Comment Submittal #66
Name: Tanya Schaefer

Comment text:
DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at the most health protective level legally available: HI 3.
All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term.
Setting all 184 listed chemicals at an HI 3 level complies with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts**.**
Comment categories linked to this comment: 1

Comment Submittal #67
Name: Marvin Rubenstein

Comment text:
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.

DEQ should accept the recommendation of its Technical Advisory Committee and include all noncancer air toxics contaminants at most health protective level legally available: HI 3.

All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term.

Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts**.**
Comment categories linked to this comment: 1

Comment Submittal #68
Name: Alicia Cohen

Comment text:
You have let the residents of Oregon down for decades. We deserve a DEQ that protects the health of Oregonians not the bottom line of polluters. Accordingly, along with so many others, I demand DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.

From a public health standpoint, an industrial site emitting air pollutants with a known Hazard Index greater than 1 without using optimal pollution controls is concerning; operating at a level over 3 is disturbing; allowing a HI of 5 is not defensible from cautious science, from the recommendations from the Technical Advisory Committee (TAC) nor the missions of DEQ, OHA, and the Multnomah County Health Department.
Comment categories linked to this comment: 1, 8

Comment Submittal #69
Name: Dyann and Tom Alkire

Comment text:
Why is Oregon DEQ planning to allow 28 toxic contaminants, including DIESEL PARTICULATES, at levels 5 times higher than the level at which human health is negatively impacted?????
We expect DEQ to follow the Cleaner Air Oregon Hazard Index to hold the line on the most stringent - legally allowable - standard to protect the health of communities.
Please DEQ, don't cater to industry at the cost of tax paying citizen's health.
Comment categories linked to this comment: 1

Comment Submittal #70
Name: Aaron C.

Comment text:
I'm sick. This is Part of it. DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3. Health comes before profit. Or it should.
Comment categories linked to this comment: 1

Comment Submittal #71
Name: Leela Devi

Comment text:
DEQ - Please do your job. Your Technical Advisory Committee has recommended that all non-cancer air toxic contaminants be kept at or below HI 3. Please follow their direction.
Comment categories linked to this comment: 1

Comment Submittal #72
Name: Jake Vacarella

Comment text:
DEQ should accept the recommendation of its Technical Advisory Committee and include all non- cancer air toxics contaminants at most health protective level legally available: HI 3.
All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541.

The bill expressly directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts**.**
Comment categories linked to this comment: 1

Comment Submittal #73
Name: Rachel Elizabeth
Comment text:

My name is Rachel Elizabeth. I live in Portland, Oregon. I live in North Portland very close to I5 and also to Swan Island. The current levels of air pollution are already a health hazard. Diesel particulate matter and also many other noxious, carcinogenic, toxins emitted from Swan Island are already at levels that are unhealthy and the DEQ should work lower the levels of toxins in our air, not raise the toxic output.

Stop allowing industries, including woodsmoke from restaurants, to operate without proper air cleaning systems. The air in Portland literally stinks.

My message to you is: DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
Comment categories linked to this comment: 1, 3

Comment Submittal #74
Name: Franny French

Comment text:
It's anathema to me and to many in my community I've spoken with or attended public meetings with why the DEQ, a supposed watch-dog group, is planning on raising toxic thresholds at a time when the world is in a global crisis that threatens any year now to squeeze all the healthy breathable air from our atmosphere.

As a living, breathing creature myself, the following has me extremely concerned:
Unless altered from current proposed rules, Oregon DEQ plans to allow 28 toxic contaminants, including DIESEL PARTICULATES, at levels 5 times higher than the level at which human health is negatively impacted. Tell DEEQ you expect the Cleaner Air Oregon Hazard Index to hold the line on the most stringent – legally allowable – standard to protect the health of communities.

So please do the reasonable, healthy, and responsible thing and work for the people by LOWERING toxic emissions levels in this state, not freaking RAISING the toxic threshold for polluting industries. No offense, but have you gone crazy, or corrupt, or what? Because you have stopped making sense if you continue down the slippery slope you're already on. Work for, not against, the people.
Comment categories linked to this comment: 1, 3

Comment Submittal #75
Name: Charmian Creagle

Comment text:
DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3. Please consider our health long term.
Comment categories linked to this comment: 1, 3

Comment Submittal #76
Name: Jessica Applegate-Brown

Comment text:
Accepting the recommendations of the Technical Advisory Committee and of the majority of the RAC for Cleaner Air Oregon is the ONLY responsible answer. Shifting different levels to different substances because you are told that certain substances cause more or less damage or are not in use in Oregon is not a reasonable excuse to have more lenient standards. The reasons are as follows: 1. Industry can swap out less regulated chemicals with similar properties and get away with more emissions, 2. Anything with an HI of 1 or over is already hazardous by definition, and 3. With the lack of science which is used as an excuse by Industry to regulate less, instead, DEQ should exercise the Precautionary Principle and follow the advice of its experts on the Technical Advisory Committee and regulate at the most stringent level allowed under law- unfortunately, this is currently an HI of 3.

Cleaner Air Oregon was already sold out with the SB1541 so-called negotiations. We all know that by separating the HI with separate rulemaking it weakened the intent of Cleaner Air Oregon even further. Please remember that advocates and the vast majority of the RAC opted and fought for the MOST stringent standards of an HI of 1.
Comment categories linked to this comment: 1

Comment Submittal #77
Name: Karen Harter

Comment text:
Follow Technical Advisory Commission directive and act to protect public from non cancer toxins (in addition to cancerous toxins) at highest level legally possible H3. We are exposed to health hazards at unacceptably high levels. This is dangerous to a wide variety of populations ultimately vulnerable to outrageous consequences. Children, elderly, compromised autoimmunity, community and more, all of us have a right to healthy air and water. Regulate the polluters. Make them stop. Fines are not enough. K. Harter
Comment categories linked to this comment: 1, 8

Comment Submittal #78
Name: Kim Wilhoyte

Comment text:
Please do not listen to the companies that have been polluting our air! Daily, when the wind is just right on the river, I gag and have to close windows! The pollution is thick and my child says "mommy why does it smell so bad? Please close the windows, I don't want to go outside". She 5! I implore you to accept the recommendation of your Technical Advisory Committee and include ALL non-cancer AIR-TOXIC contaminants at the MOST health-protective levels legally available. All emissions from Oil Re-refiners should be included!
Comment categories linked to this comment: 1

Comment Submittal #79
Name: Tia Knuth

Comment text:
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.

DEQ should accept the recommendation of its Technical Advisory Committee and include all non- cancer air toxics contaminants at most health protective level legally available: HI 3.

All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.
Comment categories linked to this comment: 1

Comment Submittal #80
Name: Bridget E. Bayer

Comment text:
Set Cleaner Air Oregon Hazard Index benchmark level at HI3 to better protect our community health
I support the recommendation of your Technical Advisory Committee who recommends including all non-cancer air toxic contaminants to be allowed only at most health-protective level legally available: Hazard Index 3 (HI3). Setting the benchmark level at HI3 instead of HI5, will allow DEQ to establish more protective health standards and allow existing facilities to estimate site-specific risk fairly.
Cleaner Air Oregon was created to inform rule-makers, among other things, how to reduce the non-cancer hazard index thresholds for toxic air contaminants throughout Oregon. These contaminants cause developmental or other severe human health impacts.
Comment categories linked to this comment: 1

Comment Submittal #81
Name: Laura Miller

Comment text:
Now is the time for all people to come to the aid of our lungs.
Please DEQ don't let us down. We expect the Cleaner Air Oregon Hazard Index to hold the line on the most stringent - legally allowable - standard to protect the health of communities.

Please DEQ listen and accept the recommendation of the Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
It's usually about money! What is the quality of air worth? Do the right thing!
Comment categories linked to this comment: 1

Comment Submittal #82
Name: Marna Herrington

Comment text:
Unless altered from current proposed rules, Oregon DEQ plans to allow 28 toxic contaminants, including DIESEL PARTICULATES, at levels 5 times higher than the level at which human health is negatively impacted.

I expect the Cleaner Air Oregon Hazard Index to hold the line on the most stringent (legally allowable!) standard to protect the health of our communities.

Toxic contaminants purposely allowed to pollute our air is not acceptable.
It is astonishing that that Oregon DEQ needs to be reminded of this.
Comment categories linked to this comment: 1, 3

Comment Submittal #83
Name: Robert Greene

Comment text:
Don’t pollute the air with diesel at 5 x the level that diesel impacts humans.
DEQ should accept the recommendations of its technical advisory committee to include all non cancer air toxics contaminants at most health protective methods legally available.
Oregon needs better enforcement of clean air regulations.
Comment categories linked to this comment: 1

Comment Submittal #84
Name: Claud Gilbert

Comment text:
The DEQ, OHA, and the Multnomah County Health Department have all recommended that HI 5 not be allowed. As a life-long Oregonian and voter I urge you not to allow pollutant levels beyond accepted safe levels. From a public health standpoint all industrial pollutants should be minimized as much as possible. Levels of pollutant emissions of HI 1 and beyond should be closely monitored and mediated. Oregon must lead the way is clean air standards.
Comment categories linked to this comment: 1, 8

Comment Submittal #85
Name: Jennifer Cockrell

Comment text:
Given that our area experiences poor air quality on a daily basis, it's unbelievable that Oregon DEQ would even consider allowing 28 toxic contaminants, including diesel at levels higher than is considered healthy.

I expect the Cleaner Air Oregon Hazard Index to hold firm to legally allowable levels vs. what is proposed.

DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
Comment categories linked to this comment: 1, 3

Comment Submittal #86
Name: Joshua Baker

Comment text:
I am writing to urge the CAO development team to heed the recommendations of the Technical Advisory committee, and adopt HI-3 standards rather than the current HI-5 standards in the Cleaner Air Oregon plan. Especially in Multnomah County, where we have experienced almost 20 health advisory days since September due to air pressure inversions, HI-5 standards are not sufficient to reduce health impacts to Portland citizens. Industries who cannot adapt more stringent emissions standards are not compatible with a growing population.
Comment categories linked to this comment: 1

Comment Submittal #87
Name: Jan Roxburgh

Comment text:
Accepting the recommendations of the Technical Advisory Committee and of the majority of the RAC for Cleaner Air Oregon could be the most responsible action to take. Unfortunately just shifting different levels to different substances because it is claimed that certain substances cause more or less damage, or are not in use in Oregon, is not a good enough reason to have more lenient standards. Note:
1. Industries can swap out less regulated chemicals with similar properties and get away with more emissions,
2. Anything with an HI of 1 or over is already hazardous by definition,

3. DEQ should exercise the Precautionary Principle and follow the advice of its experts on the Technical Advisory Committee and regulate at the most stringent level allowed under law.
Separating the HI with separate rulemaking weakened the intent of Cleaner Air Oregon. Please remember that advocates and the vast majority of the RAC opted and fought for the MOST stringent standards of an HI of 1.
DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at the most health-protective levels legally available: HI 3.

All 184 of the Listed Non-cancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by the standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for non-cancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. Industries need to step up and do everything possible to be good neighbors and protect the health of residents, their employees, and the environment. It is simply the right thing to do.
Comment categories linked to this comment: 1, 8, 14

Comment Submittal #88
Name: Tiffany Woodside

Comment text:
Shame on you DEQ. My family continues to suffer. We are ALL severe anemic with heavy metal toxicity since moving above the tie plant among a host of more serious illness. My mom has cancer, sister MS...the list goes on. Sickness is normalized. Education is none. I have researched for years and I don't know how ANY of you sleep at night. The lack of action/protection in The Dalles seems nothing short of criminal to me. Union Pacific paying DEQ seems a bit of conflict of interest. Linda Gorman's relationship and actions with John Huffman seems a conflict of interest for The Dalles. Allowing a kids fun zone to be put into an ancient building with a cancerous history across the street from a 100 yr old reopened superfund tie plant per our undereducated city officials seems like a conflict of interest to me. Not considering cumulative effect in our community is killing us and seems insanely asinine. We have at least 7 superfund sites. Toxic landfill, google, reopened tie plant and aluminum plant, superfund aluminum dump directly across the river. You sneak in Oregon's first waste sludge for profit facility, WE ARE SOAKING IN DEADLY CARCINOGENIC TOXIND DAILY and you allow these polluters to self-report and self-police. This is a conflict of interest for the generations of sick and suffering in my community. Shame on you for not testing or educating the community to protect themselves. People falsely believe this is what you do. You DEQ come to my community and talk bubbles around why you will continue to allow our town to be a toxic sacrifice town. You refuse to release/ disclose data for years. You make it near impossible to work as a citizen scientist to help the community. IT is time that you STOP this nonsense, deceit and wasting of time. Per employees at facilities in The Dalles. Nothing gets reported to OSHA or DEQ. There is no oversite to protect employees or citizens. We need proper testing and regulation. DEQ need to start working for the ENVIRONMENT instead of industry. Years of research and DEQ communication just gets me passed off on different people, same story for years and now a PR girl. I don't have another 10 years to spend on emails in an effort to save my community. You DEQ stand in the way of any hope of a health future. TIME TO CHANGE!
A HEALTH INDEX NUMBER (HI) OF 1 IS THE DEFINITION OF HEALTH PROTECTIVE for air toxics with non-cancer health impacts.

To follow the mandate of Cleaner Air Oregon and set the Hazard Index for **ALL 182 toxics*** at a level 3. The language of SB 1541 ("severe health impacts") allows DEQ this latitude. There is simply NO REASON not to set all 182 of these toxics at the most protective level allowable by law.

Here's the breakdown:
An HI above 1 is not health protective.
600 air toxics are being tracked under Cleaner Air Oregon
259 will be regulated because they have established Toxic Risk Values which set the level for determining health risk.
182 of the 259 have non-cancer health impacts. (These are the ones addressed in this rulemaking.)
156 of the 182 were determined to have "developmental or other severe health impacts".
THIS RULEMAKING PROPOSES (as allowed by SB 1541) to allow **existing facilities to pollute up to:
- an HI 3 for the 156 air toxics with "developmental or other severe health impacts"
- an HI 5 for the remaining 26
SB 1541 does not allow the HI to drop below 3 for existing facilities until it sunsets in 2029.
😑😁
Letting those last 26 toxics linger at an HI 5 is ridiculous.

The language of SB 1541 ("severe health impacts") allows DEQ this latitude. They are free to determine that the subjective language of the law allows them to declare all 182 of these pollutants to have severe health impacts. And the higher the Hazard Index number, the more severe those impacts will be. There is simply NO REASON not to set all 182 of these toxics at the most protective level allowable by law.
Comment categories linked to this comment: 1, 8

Comment Submittal #89
Name: Peggy Reid

Comment text:
As a resident of NW Portland, adjacent to the industrial area, and a mom raising kids here, I am sadly all too familiar with the air pollution risks we are exposed to every day. It is a truly helpless feeling. Please, I encourage you to listen to the recommendations of your Technical Advisory Committee to include all non-cancer air toxins at the highest level legally available, HI 3. Please protect our families and our community!
Peggy & Matt Reid
Adeline Reid, age 14
Clayton Reid, age 12
Susan Reid, age 82
Comment categories linked to this comment: 1

Comment Submittal #90
Name: Kathie Leck
Comment text:

Stop allowing California and Washington to dump their old diesel trucks in Oregon by upholding the most stringent and legally allowable standard for 28 toxic contaminants, especially diesel particulates.
I moved to Oregon in 2005 and I commute to work by bicycle every day. I don't want my lungs or the developing lungs of children who live and go to school near highways and manufacturing to be absorbing toxic chemicals. Oregonians deserve to have clean air.
Comment categories linked to this comment: 1, 3

Comment Submittal #91
Name: Ed Curtin

Comment text:
Dear DEQ Commission members:
In the Irvington neighborhood where I live, freeways lie close by, to the west and to the south. My grandchildren live even closer to the Banfield. And the cooperative farm and garden near Emanuel Hospital and across from the middle school, where a bunch of us grow fruits and vegetables for families in need, the Interstate freeway is practically overhead.

For the health and safety of all those eating our food, studying at our schools, living in our neighborhoods, PLEASE accept the recommendation of your technical advisory committee and include all non-cancer contaminants at the most health-protective level legally available: HI 3.

Allowing HI 5 is NOT acceptable. We do not want these 28 contaminants, including diesel particulates, impacting our health.
Comment categories linked to this comment: 1, 8

Comment Submittal #92
Name: Kayla Solsbak

Comment text:
As a resident of Oregon, I ask that the DEQ accept the recommendations of its Technical Advisory Committee and include all noncancer air toxics contaminants at the most health protective level legally available: HI 3. This is a crucial decision for the health of myself and others who are more vulnerable than I am.
Comment categories linked to this comment: 1

Comment Submittal #93
Name: Margaret Murdock

Comment text:
Please implement the recommendations of your Technical Advisory Committee, and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3.
The current proposed rules would allow 28 toxic contaminants, including diesel particulates, at levels that are very harmful to human health. According to Neighbors for Clean Air, the current proposed rules would allow FIVE TIMES more contaminants in the air than the level at which they can cause harm. Neighbors for Clean Air is a group started by North Portland teenagers at Roosevelt High School because of the increased levels of asthma and other problems caused by air pollutants in their neighborhoods. Diesel and gasoline particulate pollution is particularly high in North Portland. I myself had to move out of Portland because of asthma, so this issue has impacted me personally. Cancer is not the only important health issue. When you think about it, it’s obvious - breathing is essential.

I hope the DEQ steps up to the plate to help protect our public health and restore clean air to our beautiful state. Please implement the most stringent legally allowable standard: HI3.
Comment categories linked to this comment: 1, 8

Comment Submittal #94
Name: Susan Gere

Comment text:
I wonder why DEQ is so typically willing to accept the minimum. It seems an abrogation of mission. On this issue, it seems even LESS than the minimum is intended.

Is our health *not* your top priority? —If you are using some ghastly dollars-to-deaths cutoff point, it is FAR TOO PERMISSIVE. We the People, expect the Cleaner Air Oregon Hazard Index to hold the line on the most stringent legally allowable standard to protect the health of our communities.
Thank you for not knuckling user to industrial pressure. We rely on you!
Comment categories linked to this comment: 1

Comment Submittal #95
Name: Tamara DeRidder, Chair
Organization: Rose City Park Neighborhood Association

Comment text:
I implore you to act in accordance with SB 1541 and place these [26] air contaminants at a H1 3 level.
Comment categories linked to this comment: 1

Comment Submittal #96
Name: Dawn Smallman

Comment text:
I'm writing to urge you to accept the recommendation of your Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3. Any lower air quality standard than this creates disease, illness and death in our communities from air pollution.
Comment categories linked to this comment: 1

Comment Submittal #97
Name: Chris Canote

Comment text:
DEQ should accept the recommendation of its Technical Advisory Committee and include all non-cancer air toxics contaminants at most health protective level legally available: HI 3. It continues to amaze me that this is in question. Protect human health. Corporate profits are not DEQ's concern.
Comment categories linked to this comment: 1

Comment Submittal #98
Name: Ed Gorman

Comment text:
The most stringent rules possible should be adopted. Period. End of story.
Comment categories linked to this comment: 1, 8

Comment Submittal #99
Name: Aaron Brown

Comment text:
I'm writing in today to ask DEQ to please listen to the policy recommendations proposed by Neighbors for Clean Air. Diesel Particulate Matter should absolutely be regulated with an abundance of precaution and with priority towards preserving the health and well-being of the vulnerable Oregonians unfortunate enough to live near freeways and other locations of high emissions. Clean air needs to be a right that all Oregonians across the state share, and I encourage DEQ to work closely with public health officials and clean air advocates to support this crucial environmental justice initiative.

Comment categories linked to this comment: 3

Comment Submittal #100
Name: Vivian Christensen

Comment text:
After the moss study revealed to the public just how lax our air pollution regulations are in Oregon, the DEQ promised to put the protection of human health as their first priority. I attended several public meetings and each time representatives from the DEQ said that they were going to make broad changes to both the permit process as well as the level of permissible exposure levels. In fact, Cleaner Air Oregon was supposed to once and for all put the health of the public before the interests of industrial polluters. I was truly disheartened to learn that the DEQ is once again ignoring human health in its latest proposal for the Cleaner Air Oregon Hazard Index which would allow several air contaminants at five times the level at which human health is harmed. For instance, under DEQ's current proposal, diesel, which is a known health hazard that causes severe health problems such as heart disease and asthma, and has been associated with the development of Alzheimers disease remains at a hazard index five times what is considered safe. We can do better than this. Please, please do your job and fulfill your mission of protecting the health of Oregonians. I urge you to reconsider and place air contaminants known to cause harmful health effects at HI 1.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #101
Name: Julie DiLeone

Comment text:
The State of Oregon needs to do more to protect and improve air quality. We have an air pollution problem. We need to be as protective as possible with individual pollutants because people living near industrial areas, freeways, and/or train tracks breathe in combinations of these pollutants. DEQ should move all identified toxic air contaminants into the most health protective standard legally possible. Given the current science around the health impacts of exposure to diesel particulate matter, it is simply astounding that DEQ would not move DPM to the more protective health standard. Please do more to protect the health of all Oregonians.
Comment categories linked to this comment: 3

Comment Submittal #102
Name: Josh Gold

Comment text:
Diesel Particulate Matter should be moved to the Health Standard HI3.
Let's catch up with other states that have stricter diesel pollution standards such as Texas, California, Washington, and others. Cleaner air for all!
Comment categories linked to this comment: 1, 3

Comment Submittal #103
Name: Katharine Salzmann

Comment text:
A Hazard Index value of 1 is the definition of health protective. Any air toxic with a higher HI value will be harmful to human health.

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.

Please set the risk action level for ALL 182 chemicals in question at a HI of 3.
The law allows DEQ the latitude to do this and since there is *no compelling reason not to* apply the most protective levels, the agency should proceed with caution according to the mandate of Cleaner Air Oregon and adopt the most protective levels allowed by the statute.

You have already made a strong argument in favor of setting the HI limit at a 3 for all 182 chemicals in your own report on the Outcomes of the Technical Advisory Committee convened for this rulemaking: *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, depending on the person experiencing them. Adverse health effects from chemical exposure can also affect sensitive individuals to a higher degree relative to other individuals due to a wide variety of factors. As an analogy, a bee sting will cause a potentially life-threatening allergic reaction in some individuals but cause relatively little harm to health in other individuals.*

You have clearly outlined your elbow room and made a compelling argument supporting the use of the most protective levels allowed by the law.

I would add a few things: Individual air toxics do not occur in isolation. The body burden of environmental toxins we are all carrying and are exposed to from multiple sources daily should be the starting point for any realistic assessment of potential health impacts. We are all already seriously compromised. For example, according to OHA 1 in 2 people in Oregon can expect a cancer diagnosis in their lifetime. That means that approximately half of Oregon's population will at some point become severely immune compromised. This calls the question raised by your own assessment noted above. You must protect the most vulnerable first, especially since the metrics being applied are already above health protective levels.

And, even though conventional toxicology *classifies* health risks according to the organ or system affected, organs do not function independently of each other EVER; when one organ or system is impacted, the whole body suffers. This is what happens in real life.

I am not a toxicologist so I cannot speak to the individual chemicals on your list of 26 proposed to retain a RAL of HI5. However I notice that diesel particulate matter is among these and we know the science has clearly designated this as a toxin with severe adverse human health effects and one that, because of its barbed structure, draws other environmental toxins into the body. Why was this given a pass? Why were any of these 26 toxins given a pass? Because somehow you figured they just weren't that bad?
I hope you did not feel that you had to leave a little pile of 5s on the table merely to appear judicious and impartial.

I know you have been hamstrung by the risk action levels set by the statute. But you have the authority and the leeway to make this rule as protective as possible. You should not hesitate to set the levels as close as you are able to the truly protective HI of 1.

Please set the risk action level for ALL 182 chemicals in question to an HI of 3.
Because you can. Because you have the power to amend the egregious nonsense negotiated into the Senate Bill.
Comment categories linked to this comment: 1, 3, 8, 11

Comment Submittal #104

Name: Robin Paynter

Comment text:
First, the proposed rules set the standard at HI3 rather than HI1 which would actually protect the public's health. Why is that? It seems the rules are designed to continue the practice of supporting business' not paying the true cost (i.e., pollution from their production) while the public must pay the cost with their health.

Second, the proposed rules exclude diesel particulate matter, despite their widely known negative health impacts. Again the proposed rules do not actually protect the public's health and seem designed to protect/privilege business over the citizenry of Oregon

Third, the 24 hour comment period allows DEQ to give the appearance of providing an open comment period when in reality it is designed to severely limit input by Oregon's citizenry. Shame.
Comment categories linked to this comment: 1, 3, 8, 15

Comment Submittal #105

Name: Brad Halverson

Comment text:
I live in a neighborhood with high levels of DPM. I support using Hi Level 3 across the board including DPM.
Comment categories linked to this comment: 1, 3

Comment Submittal #106

Name: Janice Snyder

Comment text:
Please accept these comments regarding the directive of Senate Bill 1541to establish more protective health standards for noncancer toxic air contaminants.

I am very concerned about particulate matter (PM) concentrations in the Portland area; these are likely most driven by diesel and wood smoke emissions, and pose a real threat to health for my neighbors and family, especially children and older adults. I have been tracking PM in our backyard since the spring, and have seen a notable rise lately to levels above what World Health Organization (WHO) deems safe. My child also goes to our neighborhood school which is located adjacent to a main thoroughfare for large diesel vehicles. Please revise your rules as follows, to lend credibility to the intensive efforts that have gone into the cleaner air Oregon process.

It is vital that particulate matter (from diesel or wood smoke) be added as Hazard Index (HI) 3 at least. I would support HI1, which is in keeping with medical evidence.
In addition, all of the listed toxic air contaminants should be listed as HI3.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #107

Name: Graham Crawford

Comment text:
I strongly disagree with elements of your current proposal regarding air quality standards for our state.

Your agency is proposing that 25 toxic air contaminants, including diesel particulate matter, remain at five times the level at which human health is harmed. These proposed health indexes clearly do not put the health of Oregonians first as was promised by Cleaner Air Oregon. Currently, the volume of diesel pollution allowed in Oregon is 100 nanograms per cubic meter, while in California and Washington it's 3.3 nanograms per cubic meter.

Among the 28 toxic air contaminants you are not recommending for regulation under the more health protective standard of HI3 is diesel particulate matter. There is a great deal of emerging research that demonstrates with high levels of certainty the negative and long term neurodevelopmental health impacts from exposure to this contaminant. In particular, recently published reports link exposure with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.
HI5 is a fairly weak health protective standard. I urge your agency to act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible of HI3.

Our children deserve to have the best chance of success that our great state can provide them and it is critical we protect them from contaminants that put their outcomes at risk. Please reconsider your current proposal in light of these comments.
Comment categories linked to this comment: 1, 3, 10

Comment Submittal #108
Name: Emma Petersen

Comment text:
Portland ranks among the top cities in the country with the worst, most toxic air pollution. I think that the volume of diesel air pollution that should be allowed in Oregon should be lowered to 3.3 nanograms per cubic meter, to match states like California and Washington. This is about the health of our people and the health of our Earth. Please take this into consideration in order the put the health of Oregonians first.
Comment categories linked to this comment: 10

Comment Submittal #109
Name: Bobbi Murphy

Comment text:
I request that DEQ and the State of Oregon follow the same restrictions as California and Washington and only allow 3 ppm of diesel pollution.
Comment categories linked to this comment: 10

Comment Submittal #110
Name: Marla Schroeder

Comment text:
Portland ranks among the top cities in the country with the worst, most toxic air pollution. Currently, the volume of diesel pollution allowed in Oregon is 100 nanograms per cubic meter, while in California and Washington it's 3.3 nanograms per cubic meter. Please DEQ do NOT keep it this way! That 25 toxic air contaminants - including diesel particulate matter remain at 5x the level at which human health is harmed. These proposed health indexes DO NOT put the health of Oregonians first as was promised by Cleaner Air Oregon! Please do the right thing and make us proud of you and our city!!! Human health comes first!! Thank you for all you do.... being there for me and my family and the Next Generation Portlanders!!

Comment categories linked to this comment: 1, 3, 10

Comment Submittal #111
Name: Jan Zuckerman

Comment text:
Studies show that HI1 is the level at which air emissions can harm human health. Therefore HI3 is not an acceptable and HI5 is not even a health protective standard at all. In fact HI5 disregards human health. Please move all toxic air contaminants, especially diesel particulate matter to at least a level HI3. Our community is suffering from toxic air pollution. My sister can no longer visit me in Portland because of her asthma.

Clean air is a human right and our agencies must protect us. Listen to the science and do what is right.
Comment categories linked to this comment: 1, 8

Comment Submittal #112
Name: Susan Remmers

Comment text:
I'm writing in support of adopting rules and regulations that enact the highest legal standard for public health protection standards for all air toxics within the Hazardous Index, including diesel particulate matter, which emerging science and research have shown negative and long-term health harm.
Comment categories linked to this comment: 1, 3

Comment Submittal #113
Name: Jennifer Bevacqua

Comment text:
Human health should be carefully considered in your legislation. Please move all identified toxic air contaminants to HI3. Diesel particulate matter is KNOWN to have harmful health effects.
Please do the right thing – put people over profit & bureaucracy.
Comment categories linked to this comment: 1, 8

Comment Submittal #114
Name: Kannon McAfee

Comment text:
I live in an area of North Portland that has the foulest, dirtiest air I have ever lived with. And I lived for many years within a mil of an Exxon oil refinery in the heart of East Texas oil country.
Senate bill 154 directed DEQ to be more protective of public health. Fulfill your legal obligation.
The standard should be HI3 and it should include diesel (DPM). Your agency is responsible for carrying out the precautionary principle for the benefit of the people of Oregon, not to indulge industry in continuing its common practices or preferences.
Comment categories linked to this comment: 1, 3

Comment Submittal #115
Name: April Atwood

Comment text:
DEQ is proposing that 25 toxic air contaminants, including diesel particulate matter, remain at 5x the level at which human health is harmed. This is a very bad idea! These proposed health indexes DO NOT put the health of Oregonians first as was promised by Cleaner Air Oregon.

The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3.

Diesel Particulate Matter (DPM), in particular, should be reduced in the air we breathe and brought down to the safer level currently required in CA and WA. There's no excuse to continue polluting the air with diesel with this very toxic substance!
Comment categories linked to this comment: 1, 3

Comment Submittal #116
Name: Deborah Katz

Comment text:
I just now learned that you had set a deadline of yesterday at 4 PM for people to comment about a recent regulatory decision you proposed. I hope you will still take my comments into consideration.

Is my understanding that you have proposed to keep 25 toxic air contaminants -- including diesel particulate matter (DPM) — at 5x the level at which human health is harmed.

Toxic chemicals in our air are linked to all kinds of health problems, especially asthma. I have also heard they have been linked to ADHD, autism, and Alzheimers.

I have asthma, and it is no picnic. Every cold I get can turn into pneumonia or bronchitis quickly. And I'm under 59 years old. I have had this problem most of my adult life.

Unfortunately, more and more apartments and condominiums are being placed very, very close to freeways, a location where the air has been proven to be quite detrimental to one's health.

Please, please set higher standards for the quality of our air, particularly regarding DPM.
Comment categories linked to this comment: 1, 3

Comment Submittal #117
Name: Jodie Tanner Tell

Comment text:
Please implement air quality standards that are the most health protective that is legally possible. Since Hazard Index 1 levels can negatively impact human health, we should be requiring operations at that level or below. I urge you to prioritize our health, limit and more stringently regulate Diesel Particulate Matter, and clean up our air.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #118
Name: Tamar Farber

Comment text:
1. HI1 is the level at which air emissions can harm human health.

2. The agency should move all identified toxic air contaminants to the most health protective standard legally possible: HI3.
3. Diesel Particulate Matter (DPM) is linked to higher incidences of ADHD, autism, lower school performance, and development of Alzeihmers.

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #119

Name: Dan Jaffee

Comment text:
I am writing you due to my grave concern regarding the proposed Hazard Index levels for non-cancer air pollutants in Cleaner Air Oregon. The DEQ Technical Advisory Committee (TAC) has recommended that they be regulated at the HI 3 level, the highest level currently legally allowed.

Given that HI 1 is the level at which air emissions can harm human health, allowing an industrial site (or mobile industrial source) to emit air pollutants at a Hazard Index level greater than 1 without using optimal pollution controls is concerning. Allowing operations at a level over 3 is deeply disturbing. However, allowing a HI of 5 is utterly alarming, as well as completely indefensible, based on the scientific precautionary principle, based on the recommendations from the Technical Advisory Committee, based on the missions of DEQ, OHA, and the Multnomah County Health Department, and from an environmental justice perspective.

Among these pollutants, I am especially concerned about diesel particulate emissions. Diesel Particulate Matter (DPM) is linked to higher incidences of ADHD, autism, lower school performance, and Alzeihmers disease.

In sum, I urge DEQ to accept the recommendation of its Technical Advisory Committee and to include all non-cancer air toxics contaminants at the most protective level legally available, which is HI 3.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #120

Name: 1animalover

Comment text:
Am I to understand this correctly, that you are planning to allow 28 toxic contaminants (including diesel particulates), at 5 times the level above which human health is negatively impacted? This is totally unacceptable! You should be striving to aim for the most stringent standards to protect Oregon communities. I, for one, am greatly impacted by diesel - sometimes exposure to it knocks me flat with fatigue and body aches for several days. And then there are those like my granddaughter who suffer from asthma. Everyone is impacted and there is something you can do about it. Please do what's right. This is such a critical issue. Thank you.
Comment categories linked to this comment: 1, 3, 8

Comment Submittal #121

Name: SW

Comment text:
Saying you’re protecting our air at levels 5 times higher than the level at which human health is affected is NOT doing your job! Protect at the levels that protect our health. THAT is your job. Making friends

with industry is not your job. Protecting them is not your job. They have the means to protect themselves handily. Do better than you have in the past. Much better!

Hold the line! On the most stringent, legally-allowable air quality standards. Your plans to allow 28 toxic contaminants to exist in our air at levels up to five times HIGHER than the levels at which human health is negatively affected is NOT protecting our air! DEQ has way too shameful a current history of mollycoddling polluters to keep going down this road of failing to protect us. That is your job! We pay your salaries to protect us, not polluters!
Comment categories linked to this comment: 1

Comment Submittal #122
Name: Melissa R (Rehder)

Comment text:
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.

DEQ should accept the recommendation of its Technical Advisory Committee and include all noncancer air toxics contaminants at most health protective level legally available: HI 3.

All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies, and all of these effects can be considered severe by standard definition of the term. Taking this action, to set all 184 listed chemicals at an HI 3, comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.
It should be stated that HI1 is the level at which air emissions can harm human health, HI3 is not an exceptionally aggressive standard. It could be argued that HI5 is not even a health protective standard at all.

The agency should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible: HI3

Among the 28 toxic air contaminants DEQ is NOT recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter (DPM). This flies in the face of all emerging science and research that demonstrates with increasing certainty the negative and long term nuerodevelopmental health impacts from exposure to DPM. Recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzeihmers.
Comment categories linked to this comment: 1, 3

Comment Submittal #123
Name: Paul Seer

Comment text:
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.
My wife and I both have auto-immune diseases, and research on auto-immune diseases strongly supports the fact that long-term exposure to toxic chemicals is causing a proliferation of health problems. While we have control over some of the risk factors in our daily lives, we are depending on agencies such as yours to protect us, especially when it comes to regulating and reducing industries use and disposal of toxic chemicals.

Comment categories linked to this comment: 1

Comment Submittal #124
Name: Kate Cox

Comment text:
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.
As a health care provider, a mother, and a person with chronic health conditions, I urge you to make the health of Oregon residents your top priority when setting limits on toxic chemicals.
Comment categories linked to this comment: 1

Comment Submittal #125
Name: Emilie Sakes-Webb

Comment text:
As an environmental professional born and raised in Portland, Oregon, I have some familiarity with DEQ and how things work in Oregon. We NEED DEQ to set high standards for our air in this state. We should be leaders in the fight for clean air.
Comment categories linked to this comment: 1

Comment Submittal #126
Name: Dena Turner

Comment text:
Please take a stand for human health and put human health before the profits of business.
Where there is a will there is a way, and less hazardous chemicals must be used.
Comment categories linked to this comment: 1

Comment Submittal #127
Name: Katherine Muller

Comment text:
It is critically important that you hold the line on the most stringent standard to protect the health of our communities.
Comment categories linked to this comment: 1

Comment Submittal #128
Name: Rachel Najjar
Comment text:

Dig deep and find the human in you. Can you live with yourself knowing that because of you a child was born with a birth defect that they lived with their entire life? The question to me would be why wouldn't you pass regulations protective of all human health? If the answer is money, you have sold your soul to the devil and only God can help us.

Do your job and create the strictest rules possible and protect our babies! Thank you for allowing me to live.
Comment categories linked to this comment: 1

Comment Submittal #129
Name: Craig Stephens

Comment text:
Oregon has gone from best to worst in top level air quality protections based on irrational testimony by those who claim hardship if they were to comply with clean air regulations while admitting their children and others have increasing rates of asthma and more devastating diseases but thinking that in Oregon the air will be clean because it rains a lot. It cannot be said better than this:

There was a time when Oregon could avoid emissions restrictions. Times have changed. More emitting vehicles are in use for longer times, rain scrubbing is not taking care of the load and kids are not growing up healthy in clean country air in Oregon and my grandson has asthma as so many kids do just because we live near where diesel trucks belch black smoke that covers our window sills and cars. Truckers and farmers say they care about their kids and don't have to be told they are sickening themselves and everyone else to refurbish, they always do it with no problem. But they don't and it is. It is the easiest thing in the world to measure and refurbishing creates jobs. You and I both know that the standards need to reflect our conditions today not 60 years ago. Do the right thing and stand by it to make Oregon best.
Lake Oswego (near Hiway 43 in the "soot zone")
Comment categories linked to this comment: 1

Comment Submittal #130
Name: Leslie Pohl

Comment text:
Toxic air contaminants, especially diesel particulates need to be restricted from our air shed to protect human health. Do not ease up on these standards, but restrict them more tightly.
H1 and any pollutants that harm human heath must be controlled. We cannot accept more diesel and industry pollutants that harm our population. Do not deregulate, but put more incentives and regulations in place to curb this air pollution.
Comment categories linked to this comment: 1

Comment Submittal #131
Name: Sally Riley

Comment text:
Please protect our children and families by raising the standards for clean air quality in Oregon. You will be protecting Oregon's future by doing so.

Diesel Particulate Matter (DPM) is linked to higher incidences of ADHD, autism, lower school performance, and development of Alzeihmers. Please say no to diesel.
Comment categories linked to this comment: 1, 3

Comment Submittal #132
Name: Kerrill Knaus Hardy

Comment text:
As a person who suffers from breathing problems I encourage the Environmental Quality Commission to approve rule amendments to OAR 340 division 245 of its administrative rules. Please keep Oregon's air as clean as possible.

Comment categories linked to this comment: 1

Comment 133
Name: Diane Luck

Comment text:
I respectfully urge you to increase protective health standards in every way possible. We are exposed to more and more pollutants and carcinogenic substances every day. Please help us stay healthy and employ the strictest of standards.
Comment categories linked to this comment: 1

Comment Submittal #134
Name: Shirley Boucher

Comment text:
Please support stronger air pollution standards. Public health should be a priority for those who have the power to influence it.

You and yours breath air and drink water too. Don’t kid yourselves. It matters.
Comment categories linked to this comment: 1

Comment Submittal #135
Name: Ida Sorenson

Comment text:
I request that the DEQ establish much more protective health standards for contaminants than those being proposed. My neighborhood and children have been negatively affected by air pollution (toxic soil, asthma). The DEQ should be acting in our best interests, not the interests of companies releasing these toxins. Please change the health standards to an expectation of clean, safe air, not the unacceptable, unsafe levels being proposed.
Comment categories linked to this comment: 1

Comment Submittal #136
Name: Elise Eden

Comment text:
DEQ must accept recommendations from the tech committee.

We are talking about the air we all breathe—do the right thing for our future.
Comment categories linked to this comment: 1

Comment Submittal #137
Name: Brenda and Larry Smith

Comment text:
RE: Comment on Proposal Cleaner Air Oregon Hazard Index Rulemaking
As a person with emphysema and oxygen dependent, I see S.1541 essential to my life.
Oregon is reported to be in the top 25 states for the worse air. This is a list that which Oregon should not be included.

Please include the recommendation of the Technical Advisory Committee and include all 184 contaminants.

Please strengthen cleaner air and reduce the toxic air contaminants.
I emphysema and am very aware of our air pollution.
Comment categories linked to this comment: 1

Comment Submittal #138
Name: Randy Hart

Comment text:
Who defines "best available control technology"?
How will these individuals be selected (specific criteria and process to be used - including by whom)?
How will economic factors be included in determining a "best available control technology"?
Comment categories linked to this comment: 31

Comment Submittal #139
Name: Randy Hart

Comment text:
Has the smoke from Kerosene heaters been considered and/or regulated? It certainly is offensive to the nose, especially during inversions, and must have dangerous chemicals in it.
Comment categories linked to this comment: 31

Comment Submittal #140
Name: Damon Richardson

Comment text:
We are fine with the clean air requirements not being as stringent as those in California. Please consider that the requirements that you put out do have real impact to public organizations (Schools, parks, city, etc.), small business, big business, and residents. All regulation and rules have unintended consequences, it seems as though the only people who suffer these consequences the most are those who can't afford to comply. Who the city and state say they are trying to help.
Comment categories linked to this comment: 1

Comment Submittal #141
Name: Cheryl Rubenstein

Comment text:
These chemical are a hazard to our health, and should be regulated. Please help keep our air free of these chemicals.

Please re-think allowing toxic levels of diesel fumes to be in the air. It’s time we/you protected people instead of corporate interests.
Comment categories linked to this comment: 1, 3

Comment Submittal #142
Name: Susan Mates

Comment text:
We need the CAO program to create the highest health standards possible to protect our health. The proposed rules, which move more than 150 toxics to the more protective Hazard Index of 3 (vs. the colossally unproductive HI of 5) is at least a step in the right direction. Please uphold these new, stricter standards and continue to work to improve your program.
Comment categories linked to this comment: 1

Comment Submittal #143
Name: Thomas McAlarney

Comment text:
Anything you can do to make our air cleaner would be greatly appreciated.
Comment categories linked to this comment: 1

Comment Submittal #144
Name: Kevin Wright

Comment text:
From the Governor:
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.

From me:
My family is choking on nasty fumes that vary from Diesel to paint fumes on any given day. Telling me kids to stop playing soccer outside and come inside to play is not ok. We're choking in North Portland (University Park).
Comment categories linked to this comment: 1, 3

Comment Submittal #145
Name: Josh Gold

Comment text:
Food for thought from recent air pollution related current news:
Air Pollution Now Strongly Linked to Mental Illness
Air pollution nanoparticles linked to brain cancer for first time
Comment categories linked to this comment: Comment noted.

Comment Submittal #146
Name: Jeanne Roy

Comment text:
I understand that EQC will be considering rule amendments to OAR 340 division 245 of its administrative rules.
I am in favor of the following amendments:

- Adjust the benchmark, or Risk Action Level, at which existing facilities regulated under the Cleaner Air Oregon program must take action to reduce noncancer risk from 156 noncancer toxic air contaminants. This action would lower noncancer Risk Action Level benchmarks for 156 toxic air contaminants from a Hazard Index of 5 to a Hazard Index of 3.

- Provide a calculation for existing facilities to estimate site-specific risk if they emit a mix of noncancer toxic air contaminants that are regulated at both a Risk Action Level of a Hazard Index of 3 and a Hazard Index of 5.

It's understandable that facilities that emit hazardous air pollutants would like to keep their costs low, but that can result in human suffering. Public health must have priority. DEQ should move all identified toxic air contaminants to the most health protective standard legally possible: HI3.
Comment categories linked to this comment: Comment noted.

Comment Submittal #147
Name: Karen Harter

Comment text:
Dear DEQ: To protect the health we have a right to you must hold industry responsible for exceeding limits and enforce the law. That's your job.

The Pollution levels In Portland and Hillsboro are intolerable. Autism is clearly linked. Multiple Sclerosis clusters predominate here. This and other neurological diseases are triggered by toxins: Parkinson's is one. Also, of course, heart and lung disease, breast cancer, learning disability, arthritis, infant mortality, asthma are clearly connected to pollution. We as citizens have a right to health. Legislators must enforce, monitor, require further regulation. If the head of EPA is working counter to our best interests they must be held accountable, impeached, indicted.
Comment categories linked to this comment: Comment noted.

Comment Submittal #148
Name: Jeanne Longley

Comment text:
I support amendments to OAR 340 division 245 Thank you for addressing the reduction of harmful air contaminants.
Comment categories linked to this comment: Comment noted.

Comment Submittal #149
Name: Markle Fakele

Comment text:
Please clean up the Portland air. Set the standards at least to California, it isn't hurting their economy?
Comment categories linked to this comment: 1, 10

Comment Submittal #150
Name: Sandra Vermilya

Comment text:
I have had asthma all my life and have experienced increasingly worse symptoms these past 2 – 3 years. I have lived in the same house near Precision Cast Parts since 1988. The air quality has gotten much worse since1988, please reduce allowable emissions.
Comment categories linked to this comment: 1

Comment Submittal #151
Name: Jan Shea

Comment text:
Those "standards" are proposed by our ridiculous and destructive president. He has no idea what he is doing and DEQ has long been willing to sell Oregonians.
Comment categories linked to this comment: Comment noted.

Comment Submittal #152
Name: Christy Murray

Comment text:
I urge DEQ to remain faithful to its mission to restore, maintain and enhance the quality of Oregon's air, land, and water while being guided by values of public service, health, safety, and wellness.
Comment categories linked to this comment: Comment noted.

Comment Submittal #153
Name: Dell Goldsmith and Robin McLeod

Comment text:
Dear DEQ and government:
Don't let us down by weakening the standards that protect us all. Right now we are having days of air stagnation. Think of all the lungs: children, babies, elders and yourselves. Stand up for us!
Comment categories linked to this comment: Comment noted.

Comment Submittal #154
Name: Steven Schafer

Comment text:
Please do more to support clean air standards that affect all Oregonians! Follow the heart of SB 1541.
Comment categories linked to this comment: Comment noted.

Comment Submittal #155
Name: p. dot d, p. desemple

Comment text:
Within 2 years after moving in to my SE Portland neighborhood (about a mile and a half north of a precision cast parts facility), my wife falls over with a grand mal seizure and I begin to start smelling a burning and tasting a strange part of electric ash-like sensation.

The precision cast parts is polluting our city and harming us in our own homes. Please prepare a proposal that will allow for cleaner air. With technology advancing and industry evolving, there is not a single reason that we cannot control our poisons in a more civilized contained way.

Please Portland, this is unacceptable from a city that reaches/reduce/reuse/recycle and brags about being the green state. Please Oregon, help this pollution to a non-problem. Help use stay safe while we pay for our futures.
Comment categories linked to this comment: Comment noted.

Comment Submittal #156

Name: Darvel Lloyd

Comment text:
I agree 100% with Onward Oregon!
“We urge DEQ to remain faithful to its mission to restore, maintain and enhance the quality of Oregon's air, land and water, while being guided by values of public service, health, safety and wellness."
Thank you for doing the right thing and listen to us common citizens and residents of Oregon, not just big corporations!
Comment categories linked to this comment: Comment noted.

Comment Submittal #157

Name: Patricia Kincaid

Comment text:
I have had an "Unsafe level of air pollution" message on my phone many mornings lately. I don't want to die of COPD!!! And especially young people!
Comment categories linked to this comment: Comment noted.

Comment Submittal #158

Name: Lyle Funderburk

Comment text:
Set limits for air contaminants that cause severe human impacts.
Comment categories linked to this comment: 1

Comment Submittal #159

Name: Maureen Valdini

Comment text:
Any relaxing of necessary stringent limits on toxic emissions that certifiably harm human health in myriad ways is suicidal. To do so to enable corporate profit is reprehensible. To allow five times the current limits is malfeasance by the officials who would make such a choice. Please protect the populace, not profits. This issue really is just that simple.

DEQ, Please read and consider this compelling article before diminishing standards that somewhat protect the air we breathe, and life itself:
https://truthout.org/articles/the-climate-emergency-has-already-begun-as-earth-systems-collapse/?eType=EmailBlastContent&eId=c2728b86-39f1-4179-b2a0-8d623af72df9
Comment categories linked to this comment: 1

Comment Submittal #160

Name: Dean Sigler

Comment text:

https://www.greencarcongress.com/2019/12/20191209-ats.html

Study finds rapid health benefits following air pollution reduction

09 December 2019

Reductions in air pollution yielded fast and significant impacts on health-outcomes, as well as decreases in all-cause morbidity, according to new open-access research published in *Annals of the American Thoracic Society*.

The study by the Environmental Committee of the Forum of International Respiratory Societies (FIRS) reviewed interventions that have reduced air pollution at its source. It looked for outcomes and time to achieve those outcomes in several settings, finding that the improvements in health were striking. Starting at week one of a ban on smoking in Ireland, for example, there was a 13% drop in all-cause mortality, a 26% reduction in ischemic heart disease, a 32% reduction in stroke, and a 38% reduction in chronic obstructive pulmonary disease (COPD). Interestingly, the greatest benefits in that case occurred among non-smokers.

We knew there were benefits from pollution control, but the magnitude and relatively short time duration to accomplish them were impressive. Our findings indicate almost immediate and substantial effects on health outcomes followed reduced exposure to air pollution. It's critical that governments adopt and enforce WHO guidelines for air pollution immediately.

—lead author of the report, Dean Schraufnagel, MD, ATSF

In the United States, a 13-month closure of a steel mill in Utah resulted in reducing hospitalizations for pneumonia, pleurisy, bronchitis and asthma by half. School absenteeism decreased by 40%, and daily mortality fell by 16% for every 100 $\mu g/m^3$ PM_{10} decrease. Women who were pregnant during the mill closing were less likely to have premature births.

A 17-day "transportation strategy," in Atlanta, Georgia during the 1996 Olympic Games involved closing parts of the city to help athletes make it to their events on time, but also greatly decreased air pollution. In the following four weeks, children's visits for asthma to clinics dropped by more than 40% and trips to emergency departments by 11%. Hospitalizations for asthma decreased by 19%.
Similarly, when China imposed factory and travel restrictions for the Beijing Olympics, lung function improved within two months, with fewer asthma-related physician visits and less cardiovascular mortality.

In addition to city-wide polices, reducing air pollution within the home also led to health benefits. In Nigeria, families who had clean cook stoves that reduced indoor air pollution during a nine-month pregnancy term saw higher birthweights, greater gestational age at delivery, and less perinatal mortality.
The report also examines the impact of environmental policies economically. It highlights that 25 years after enactment of the Clean Air Act, the US EPA estimated that the health benefits exceeded the cost by 32:1, saving 2 trillion dollars, and has been heralded as one of the most effective public health policies of all time in the United States.

Emissions of the major pollutants (particulate matter [PM], sulfur oxides, nitrogen oxides, carbon monoxide, volatile organic compounds, and lead) were reduced by 73% between 1990 and 2015 while the US gross domestic product grew by more than 250%.

Air pollution is largely an avoidable health risk that affects everyone. Urban growth, expanding industrialization, global warming, and new knowledge of the harm of air pollution raise the degree of urgency for pollution control and stress the consequences of inaction.
Fortunately, reducing air pollution can result in prompt and substantial health gains. Sweeping policies affecting a whole country can reduce all-cause mortality within weeks. Local programs, such as reducing traffic, have also promptly improved many health measures.

—Dr. Schraufnagel

Resources

- Dean E. Schraufnagel, John R. Balmes, Sara De Matteis, Barbara Hoffman, Woo Jin Kim, Rogelio Perez-Padilla, Mary Rice, Akshay Sood, Aneesa Vanker and Donald J. Wuebbles (2019) "Health Benefits of Air Pollution Reduction" *Annals of the American Thoracic Society* doi: 10.1513/AnnalsATS.201907-538CME

Comment categories linked to this comment: Comment noted.

Comment Submittal #161

Name: Cynthia Care

Comment text:
Please do NOT allow more pollutants into our air. Keep standards stringent, protect our health.
Comment categories linked to this comment: 1

Comment Submittal #162

Name: Serena Bergstrom

Comment text:
You are willingly poisoning the population for more profit willingly putting children in deadly situations your levels are way over the legal limit please if for no other reason do it so children can survive long enough to grow up to be adults diesel is death smog is death if you wouldn't want cancer so don't cause others to deal with cancer so please ask your superiors to consider the risk you can at least do that!
Comment categories linked to this comment: Comment noted.

Comment Submittal #163

Name: Melissa Mccaw

Comment text:
I see that deconstructing diesel is trying to get items such as diesel particulates put on a toxic index. Senator Dembrow is behind this group because he can't ram it thru on legislation. Diesel particulates have been proven not to harm humans or cause cancer. Dr.Dunn did extensive research and came out with real science and was fired for it because it didn't back an agenda that was being pushed please don't fall for this non sense and turn Oregon into California any more than it is.
Comment categories linked to this comment: 1, 3

Comment Submittal #164

Name: Joe Rowe

Comment text:
I purchased an outdoor air sensor from PurpleAir.com (dual laser sensor)
We need much stricter regulation on all forms of air pollution
We need to look at real data rather than "modeling" of data. We now have more air data sensors in private hands. This private data is much more accurate than modeling based one single government sensor at SE Powell and 54th (LaFayette)

I've attached the data for 30 private sensors in Portland (see picture)
Nov 23rd to Nov 29th spans seven days.

Over 7 days this grid of 30 private data sensors show that the average air quality in Portland is not safe. On those same seven days the local air alerts for Multnomah County 5 clean green air days and only 2 days of yellow alert emails. See below.

Multnomah County staff are using flawed science when they could use much more accurate data. The last two days (Nov 30th and 29th) have both days with a daily average that's unsafe, yet no yellow day has been declared by the County Staff. Even when yellow air days are announced, there is no binding change. The yellow days ask polluters to curb their actions in a voluntary manner.
What Portland data does Mult Co use? A single sensor at SE 54th and LaFayette Ave. They also use "modeling" and 4 suburban sensors. The one single sensor in Portland is at Powell and 54th (LaFayette Ave)

What is DEQ doing? Zero. Nothing. I see no DEQ actions to curb the constant toxic air in Portland. The only reason DEQ took action on the glass polluters is when the press published the very toxic data discovered by the US forest service.

https://www.wweek.com/news/2016/07/12/meet-portlands-best-heavy-metal-detectors-they-uncovered-high-levels-of-heavy-metals-in-the-air-near-bullseye-glass/
I'd like a reply from my lawmakers in some detail. This includes the Multnomah Co commissioners and chair (Kafoury) in some detail. What is your plan of action? You've been collecting public comments without taking action for decades.
Comment categories linked to this comment: 31

Comment Submittal #165
Name: Lisa Erenyi

Comment text:
My family has lived in North Portland, OR. for twenty-one years. Why does this number matter? Well, it was long enough for my husband to develop stage 4/5 Hodgkins Lymphoma - a blood cancer directly related to a toxic environment.

Please use the current platform as an opportunity to support public health.
As for the reasons why this is such a battle - I will never understand.
Please do the right thing - PROTECT THE PEOPLE.
Comment categories linked to this comment: Comment noted.

Comment Submittal #166
Name: Robert Greene

Comment text:
Oregon needs better enforcement of clean air regulations.
Comment categories linked to this comment: Comment noted.

Comment Submittal #167
Name: Mrs. McCrossen / Kara Allred

Comment text:
I'm a resident of North Portland. I frequently smell toxic fumes coming from Swan Island.
The smells make me ill and give me headaches. I often can't go outside, because the smell is so bad.

My husband and I recently went through two miscarriages. While I can't prove they were caused from environmental problems, I do know the smells during those time were so intense, I had to shut myself in my room with the fan and air purifier going.

I'm very concerned about the quality of our air. In China air quality issues have been linked to miscarriage, premature death, and child development issues.

My daughter visited China once. She said all the colors were muted and hazy. Oregon is so beautiful, at the least, it would be sad to no longer see the city from the bluffs, like what happened during the summer fires.

The families, elderly, and citizens here deserve to live in a safe environment. The government, elected by the people, have the power to regulate and promote a safer quality of air.
Comment categories linked to this comment: Comment noted.

Comment Submittal #168
Name: Laney Kibel

Comment text:
It is imperative that DEQ protect the health of the citizens and neighborhoods of Portland. Hold the line by not allowing toxic chemicals to pollute our atmosphere.
Comment categories linked to this comment: Comment noted.

Comment Submittal #169
Name: Wesley Ward

Comment text:
I am disturbed to read that DEQ proposes to lower the current Air Quality Index for non-cancer toxic emissions. I live ¼ mile from the Brooklyn Railyard and I'm conscious of our air quality on a daily basis. It is already clear that Oregon has adopted a higher health benchmark for diesel particulates than California. My understanding is that there is no safe level of particulates. Therefore, it doesn't seem advisable for DEQ to adopt a higher threshold than recommended by the Technical Advisory Committee. I am concerned that many people already assume that Portland's air is fine because the Air Quality Index shown on the internet and the media indicates that it's fine. But we know that long term exposure even at low levels of particulates can be harmful to many organ systems, and that even short-term exposure can be very harmful to the elderly, children, and people with respiratory problems. I see no good reason to set a lower threshold than health experts recommend. Public awareness of health effects and the levels of pollution in many of Portland's neighborhoods is essential to building the political support for reasonable and effective regulation as we all saw in the legislative debate on HB2007, which reflected the widespread feeling that air pollution outside the three-county area is really not a serious concern.
Comment categories linked to this comment: 1, 3

Comment Submittal #170
Name: Cordie T

Comment text:
Please take whatever ste4ps are necessary to ensure that our air is among the cleanest in the nation. It has been so dispiriting to learn that we have such terrible air quality here in Portland, which has a reputation for being such a strong environmental city.
Comment categories linked to this comment: 1

Comment Submittal #171
Name: Thomas Shimota

Comment text: I want clean air hold the line against hazardous air.
Comment categories linked to this comment: Comment noted.

Comment Submittal #172
Name: Theresa Gatley
Comment text:

I have been going through lung cancer therapy for the last year. As a low income person I am eligible for the Oregon health plan. I'm sure my cancer has cost the state thousands of dollar. I think you need to protect our air quality as best you can.
Comment categories linked to this comment: Comment noted.

Comment Submittal #173
Name: Richard Newman

Comment text:
More regulations, more government, more control. None of these appeal to me. What will be proposed for this matter amounts to none of the above. No thanks.
Comment categories linked to this comment: Comment noted.

Comment Submittal #174
Name: Alan and Natalie Mandarano

Comment text:
Please keep Oregon air clean.
Comment categories linked to this comment: Comment noted.

Comment Submittal #175
Name: Juanita Remien

Comment text:
Would you please work towards getting rid of old diesel engines in Oregon? The Diesel particulate matter is impacting my breathing and general health as I live within a mile of Powell Blvd where many trucks pass by daily.
Comment categories linked to this comment: 3

Comment Submittal #176
Name: Debbie Kaye

Comment text:
PLEASE let us breathe! Looking at the air is new for me, and I've lived in Portland for 29 years, plus growing up here. Seeing brown air for days and days is horribly unhealthy. It makes people, animals and plants sick.

You must classify diesel particulates as dangerous. Don't YOU want to breathe? Otherwise we die. It really is that simple. And it is a very ugly, prolonged death..
Comment categories linked to this comment: 1, 3

Comment Submittal #177
Name: Bruce Hellemn

Comment text:
I can't believe you are not considering diesel particulate matter among air quality contaminants to be considered for health protective standards.

I live in the Overlook neighborhood and my house is 3 blocks from I-5, a quarter mile north of where I-5 and I-405 merge and 4 blocks south of Going St. which is the street where hundreds of diesel trucks travel to and from Swan Island every day. There is also construction sites up and down Interstate Ave for new apartment buildings and for the last 5 years I have to use an inhaler.
Please reconsider and add diesel particulate matter for health protective standards.
I have written before about how diesel has a negative impact on my life. I have to use an inhaler and have severe symptoms fairly often.

I live near Going St. that is the street leading to and from Swan Island. My house is also close to where I-5 and I-405 intersect on the east end of the Fremont Bridge. Because of this I am constantly exposed to high levels of diesel particulates. Washington and California have banned old diesel engines that pollute more than new diesel engines but since they are still legal in Oregon these old trucks are being moved to Oregon for continued commercial and industrial use.
It's time to stop this now. Oregon used to be known for clean air and water but sadly those days seem to be ending.

Please consider the comments from Multnomah County Health Department. "

> From comments submitted by Multnomah County Health Department: "From the public health standpoint, an industrial site emitting air pollutants with a known Hazard Index greater than 1 without using optimal pollution controls is concerning; operating at a level over 3 is disturbing; allowing a HI of 5 is not defensible."

Comment categories linked to this comment: 1, 3, 8

Comment Submittal #178
Name: Diane Dulken

Comment text:
I work in downtown Portland and the air quality has noticeably worsened over the years particularly (pun) from diesel emissions: trucks, armored vehicles, construction equipment, etc.

I urge DEQ to strengthen protections. In particular (pun again) I am compelled by the Oregonian's Polluted by Money series that showed how we are a dumping ground for dirty diesel vehicles that our neighboring states won't tolerate.

I urge you as well to follow Neighbors for Clean Airs recommendations.
Comment categories linked to this comment: 3

Comment Submittal #179
Name: Arne Fromme

Comment text:
I want to express my concern about excluding Diesel Partial Matter from SB 1541. We live a short distance from I5. My neighbors and I suffer from the daily effects of Diesel Partial Matter, and it has impacted our health. My daughter suffers from Autism disorder, and suggest there may be a link.
I believe this is the key issue. And with the California 'Dirty Diesel's' being quickly added in our state, we need to make this a priority.
Comment categories linked to this comment: 3

Comment Submittal #180
Name: Sarah Thompson

Comment text:
As an Oregonian who lives a block off of 99E/McLaughlin Blvd now and lived 10 years next to (as in my front window view was the freeway concrete wall) I-5 in North Portland a few exits before the interstate bridge. During commuting hours, trucks and cars sit bumper to bumper filling the air with particulate. I urge DEQ to regulate Diesel particulate matter. My wife has asthma and it frequency flared (ER visits) when we lived next to I-5, and is moderately better now that we are one block off the highway with much less diesel truck volume. We have to be vigilant during air stagnation advisory days to keep her asthma in check. If DEQ regulated Diesel particulate matter it would really help the health of my wife and others like her.
Comment categories linked to this comment: 1, 3

Comment Submittal #181
Name: William Bennett

Comment text:
I'm deeply concerned about air quality in the Portland area. I live near a trucking route and experience stagnant, diesel-exhaust-filled air, year-round. Additionally, my neighborhood (Saint Johns) is basically surrounded by industrial activity which seems poorly regulated. I am deeply concerned about the effects this has on my family and our neighbors. I support including more hazardous toxins to be regulated and increasing efforts to enforce those regulations.
Comment categories linked to this comment: 1, 3

Comment Submittal #182
Name: John Shaw

Comment text:
Please do not compromise our air quality standards. Diesel particulates alone cannot be tolerated. Oregon needs to take all of the dirty diesel trucks out of the state. Follow the lead of California on this.
Comment categories linked to this comment: 1, 3

Comment Submittal #183
Name: Anne Witt

Comment text:
I'm very concerned about diesel emissions in Oregon. Please do what you can to help!
Comment categories linked to this comment: 3

Comment Submittal #184
Name: Brian Earls

Comment text:
I don't really understand what is changing so some clarification would be great. A simple explanation would have been nice so what is changing because I still have no idea it makes it Hard to make an intelligent decision if it is a good chance from my perspective.
Comment categories linked to this comment: 30.

Comment Submittal #185
Name: Steve Anderson

Comment text:
First, I wish that the EQC be aware of the excellent work that Project Managers, Staff, Inter-Department Personnel, all working on this rulemaking have done. As a member of the advisory committees, this has been a very rewarding experience. Your professionalism and attention to detail has been outstanding. Please share this support for staff and their work with the EQC; thank you. I have reviewed the final rules and offer the following additions as it relates to:

- Adjusting the benchmark, or Risk Action Level, at which existing facilities regulated under the Cleaner Air Oregon program must take action to reduce noncancer risk from 156 noncancer toxic air contaminants. This action would lower noncancer Risk Action Level benchmarks for 156 toxic air contaminants from a Hazard Index of 5 to a Hazard Index of 3.

I ask that the following chemicals be reduced from a Hazard Index of 5 to 3. These chemicals affect the respiratory system and can effect in such a manner that damage is caused for which there are no recovery of lung tissues. Given the recent vaping matter, damage to lung tissues and the respiratory system is an important public health matter. Damage to lungs typically does not repair. Given that the higher action levels associated with a Hazard Index of 5 for these chemicals (as proposed in this rulemaking) is such that one can expect permanent damage to lung tissues and the respiratory system at these levels, argues for reducing these chemicals to a Hazard Index of 3 and all other requirements therein. Please consider adding these chemicals to those having a Hazard Index of 3.

- Oleum (fuming sulfuric acid)
- Refractory Ceramic Fibers
- Silica, crystaline (respirable)
- Sulfuric Acid
- Diesel Particulate Matter

Thank you for your consideration here.
Comment categories linked to this comment: 13

Comment Submittal #186 -- LETTER
Name: Jamie Pang
Organization: Oregon Environmental Council (OEC)

Comment text:
The Oregon Environmental Council ("OEC") respectfully submits these comments to the Oregon Department of Environmental Quality ("DEQ")'s October 25, 2018 proposed rulemaking for the Cleaner Air Oregon Hazard Index Rulemaking.1 We thank you for the work you have done to build the Cleaner Air Oregon program over the past couple of years and encourage you to take a "health first" stance as you continue to develop rules for implementing the program.

OEC's position is that a Hazard Index ("HI") of 5 as measured by the best available technology ("T Bact") is unacceptable. By DEQ's own words, "An HI below 1 means a person breathing a facility's emissions is not expected to experience noncancer health effects. An HI greater than 1 means a person breathing a facility's emission may experience noncancer health effects"2 which include but are not limited to respiratory problems, effects on the reproductive system, and developmental effects on infants. SB 1541 gives DEQ the authority to lower the HI of existing facilities to an HI of 3, and you should use this authority to do so. At a minimum, DEQ should act with an abundance of caution and move all identified toxic air contaminants in this category to the most health protective standard legally possible under SB 1541.

Because SB 1541 as currently enacted does not allow for regulation of existing facilities to limit hazardous pollutants below a level of HI 3, OEC submitted a ballot initiative with our allies on November 7, 2019 to close emittance loopholes and require existing and newly constructed facilities to limit their contaminants to a hazard index of 1.3 As it stands, 156 identified toxic air contaminants exist at the HI benchmark of 3.4 Benzene, for example, is on that list and is a common pollutant known to cause delayed bone formation, bone marrow damage, and in some cases, even cancer in both human and non-human species.5 Simply put, more protective-regulations are possible with existing technology, "not expected to generate significant fiscal-impacts,"6 and we see no public policy justification for DEQ to not adopt the more protective-health standards where feasible. OEC is also concerned that among the 28 toxic air contaminants DEQ is not recommending to be moved to the more health protective standard of HI3 is Diesel Particulate Matter ("DPM"). Failure to take a precautionary approach as to DPM regulation defies all current and emerging science and research that demonstrates with increasing certainty the negative and long-term neurodevelopmental health impacts from exposure to DPM. In fact, recently published reports link exposure to DPM with higher incidences of ADHD, autism, lower school performance, and development of Alzheimers.

1 DEQ, Notice of Proposed Rulemaking (Oct. 25, 2019), available at https://www.oregon.gov/deq/Rulemaking%20Docs/caohi2019Rules.pdf
2 DEQ, Overview of Proposed Hazard Index Rules (Oct. 2019), available at https://www.oregon.gov/deq/aq/cao/Documents/hazindex-overview.pdf at p. 2.
3 *New Ballot Measure Filed: Toxics Reduction and Right to Know Act* (Nov. 7, 2019), available at https://www.olcv.org/new-ballot-measure-filed-toxics-reduction-and-right-to-know-act/.
4 Overview of Proposed Hazard Index Rules, Table 1, at p. 7.
Comment categories linked to this comment: 1, 3

Comment Submittal #187 - LETTER
Name: Gregory Sotir
Organization: Cully Air Action Team (CAAT)

Comment text:
In these comments to DEQ, CAAT repeats their verbal request from the November 18, 2019 Public Hearing on this subject for DEQ to revisit and revise the list of 26 Toxic Air Contaminants that are proposed to remain as Level 5 toxins, and thus not subject to a greater scrutiny as Level 3 toxins. Diesel Particulate Matter needs to be treated as a toxin more subject to regulatory oversight by DEQ/OHA and mitigation by the polluter. Awhile back, our state of Oregon forgot to impose regulations on obsolete

diesel engines, and the state became a dumping ground for those highly polluting diesel engines. A discrepancy was created that defined Oregon from the other West Coast states as one accepting of obsolete and polluting equipment. Polluters took advantage of this discrepancy and moved engines banned in other states here. This is a type of 'toxin dumping' that unscrupulous polluters often engage in. The effect of this is for the air and the people of Oregon to become subjected to dangerously high exposure levels of Diesel Particulate Matter. The result is that Diesel Particulate Matter air pollution imposed greater harm on the people of Oregon than adjacent states and markets. Please access [https://ww2.arb.ca.gov/resources/summary-diesel-particulate-matter-health-impacts] for more information on the known dangers of Diesel Particulate Matter.

It is quite likely that other polluting industries will follow this pattern of 'toxin dumping' with chemicals that are under-regulated here, but regulated in nearby states. In particular, the proposed Level 5 toxins that are already included in California's Proposition 65 regulatory framework and warning system, need to be revised as Level 3 pollutants to prevent this 'toxin dumping.'

Below are some of these VOC's, toxins, and pollutants that are regulated under California's Proposition 65 but that are included in the proposed Oregon CAO Level 5 categorization:
Acrolein
Anilene
Dichlorovis (DDVP)
Diethelylene glycol monoethyl ether
1,2-Epoxybutane
Hexamethylene-1,6-dilsocynate
4,4'-Methylenedianiliene (and its dichloride)
Propylene
Propylene glycol dinitrate
Silica, crystalline (respirable)
1,2,3-Trichloropropane
Vinyl bromide

Even if these toxins exist, or are created, at very low emissions inventory levels, given the history of Oregon as a dumping ground for obsolete and polluting diesel engines, it is likely that polluters will move production of these toxins to our State, engaging in 'toxin dumping' and the subsequent contamination and negative health effects, so as to escape regulatory mandates existing in other states, including California. CAO does not provide for an insurance penalty for paying for injury, mitigation, or spill clean-up so that burden would fall onto the people of Oregon.

With CAO, Oregon should seek to create a more stringent, comprehensive, and protective regulatory apparatus than exists in California (and certainly one that is not less so.) Given past Agency inadequacies, a rapidly growing population who expect a healthy and safe community, and the natural beauty and the need for continued sustainability of Oregon's ecological systems and environment, CAO should regulate all contaminants currently regulated under California's Proposition 65, and any existing Washington-state statutes, at a minimum.

In closing, the Risk Analysis behind CAO is predicated on insuring our states commitment to protecting the health of the state and air we breathe, and that insurance creates a liability that should not be the burden of the taxpaying public, but on the polluter instead. If CAO does not include a comprehensive regulatory strategy for, and built-in, actionable, sanctions of polluters, including a regulatory structure at least equal to neighboring states, then it becomes a toothless agent, a paper tiger, that has little overall impact or meaning, even though it purports to be a protective force.

With the changing dynamics of our State and the climate, it is imperative that DEQ take an aggressive leadership role in regulating polluters. No longer should the State allow her people, no matter how marginalized they may be, to become the recipient of known toxins from dangerous industries and their 'toxin dumping.' DEQ, OHA, and the other State Agencies need be our shield against dangerous toxins, including the chemicals and compounds listed above, from polluters who refuse to take responsibility for the damage they create.
Comment categories linked to this comment: 1, 3, 4, 5

Comment Submittal #188 - LETTER
Name: Andrea Durbin, Director
Organization: City of Portland Bureau of Planning and Sustainability

Comment text:
The purpose of this letter is to comment on the proposed Cleaner Air Oregon (CAO) Hazard Index rules addressing the provision of Senate Bill 1541 to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. These comments are submitted on behalf of the City of Portland and reiterate submitted comments from the City's representative CAO Hazard Index 2019 Advisory Committee member.

We encourage DEQ to regulate all 182 contaminants with noncancer health effects with the same Risk Action Level (RAL) of a Hazard Index (HI) 3 to be most protective of public health. We acknowledge the work DEQ did in responding to the Advisory Committee discussion to regulate 156 chemicals toxic air contaminants at an HI of 3. However, Senate Bill 1541 overlaid limitations on CAO. This state law prevents the use of science-based hazard indices of 1. Adverse human health impacts are well established and documented for many air toxics with an HI over 1. Adopting an HI of 3 for all 184 non cancer toxic air contaminants is the most legally available health protective option.

As discussed by the Technical Advisory Committee (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. With this variation and uncertainty, an HI of 3 for all 182 contaminants is the best option to prioritize health and protect vulnerable populations.

To implement CAO, DEQ and OHA need to work within legislatively, appropriated program resources. Using the same HI of 3 for all 182 air toxics also means simpler risk calculations and could reduce DEQ's administrative work to review and manage risk analyses, permits, and enforcement. Communication of the Risk Determination Ratio, 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 a method using a mix of HI 3 and HI 5 is likely to require more time and resources to explain. This will also most likely result in additional follow up questions to work through with the public and build or maintain trust.

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 by putting all 182 contaminants at an HI of 3 will allow for more efficient information sharing and can help support increased public understanding, reduce fear, and improve trust which all affect health. Transparency also improves the ability to evaluate effectiveness of the CAO program, another requirement on DEQ's resources to implement CAO.

Thank you for the opportunity to comment on the proposed Cleaner Air Oregon Hazard Index rule addressing the important health protection from noncancer air contaminants.

Comment categories linked to this comment: 1, 3, 5, 8

Comment Submittal #189 - LETTER

Name: Erika Maria Moseson, MD, MA
Organization: Oregon Thoracic Society

Comment text:
Thank you for the opportunity to submit comments about proposed rulemaking around air toxics, and thank you all for your service to our State. The Oregon Thoracic Society is comprised of lung doctors, thoracic surgeons, and healthcare professionals who care for patients suffering from respiratory illnesses, lung cancer, and those who are critically-ill. We witness the health toll of the particulate matter in our practices while treating those who suffer from some of the many diseases caused or worsened by diesel exhaust and other air pollution. Diesel particulate matter, including PM2.5, UFP, elemental carbon, etc., represents a mix of toxic air contaminants that have reproductive health effects and damage multiple target organs causing a wide range of morbidity and mortality.

It may seem hard to understand how particulate matter from a truck tailpipe or a bulldozer engine can sicken people, but it is important to remember that the lungs are designed to extract oxygen from the air straight into our blood stream. Think of inhaling something small as an intravenous injection- fine particulate matter goes from the air into the bloodstream and circulates throughout the body causing disease. This is no different for diesel particulate matter.

Damage from air pollution starts in the womb. Exposure of pregnant women to ambient air pollution causes premature and low birth weight children.[i] Traffic pollution causes asthma attacks in children, and likely causes asthma itself with impaired lung function.[ii,iii] We can measure black carbon coughed up by children and see more lung damage with higher concentrations.[iv] Traffic-related air pollution further causes deficits in memory, cognitive function,[v] and attention[vi] with a study even showing MRI changes in children's brains.[vii]

Diesel exhaust causes cancer,[viii] but also causes a range of other potentially lethal diseases in children and adults. Air pollution from traffic decreases adult lung function and causes emphysema[ix,x] in addition to heart attacks and other illnesses resulting in death.[xi,xii] Air pollution not only increasing risk of dementia[xiii] and stroke,[xiv] but it also increases osteoporosis and bone fracture risk.[xv] Increases of 10 ug/m^3 in $PM_{2.5}$, abundant in diesel exhaust, are associated with a 7.3% increase in all-cause mortality among Medicare beneficiaries.[xvi]

Diesel exhaust is toxic, a known human carcinogen, and children are especially vulnerable to the long-term and short-term health effects of exposure to it due to their higher respiratory rates, increased activity, and vulnerable developmental windows. It is hazardous to multiple organ systems, from the cardiovascular system, respiratory system, and central nervous system to the reproductive system. Fortunately, we can make it better. Decreasing air pollution improves lung function in children.[xvii] As another example, in Washington State, improvements in diesel fleets decreased the particulates to which children were exposed and also decreased missed school days, particularly in children with asthma.[xviii] The lung diseases that are caused or worsened by air pollution are very expensive and common. Around 6% of Oregon residents surveyed in 2011 stated they had been told that they had COPD, but the number is likely higher.[xix] Cost for this care will fall disproportionately on taxpayers, as patients with COPD are more likely to be unable to work and have a household income less than $25,000.[8] Asthma is also a significant burden in our state, affecting 10% of adults and 7% of children totaling over 360,000 Oregonians[xx] and responsible for over 2000 people hospitalized for asthma in 2012 alone. Healthcare costs will again fall disproportionately on taxpayers, since those affected by asthma often have lower income, and are more frequently enrolled in the Oregon Health Plan and CHIP. In addition to the toll on

human health and direct healthcare spending, there are also costs in worker productivity. Over 25% of people in Oregon with asthma missed more than one day of work due to asthma,[xxi] and children are also likely to miss school because of asthma.

COPD and asthma cost more than $100 billion per year, over $50 billion for COPD in the US[xxii] and $56 billion for asthma in 2007,[xxiii] likely more since that time, with estimates of asthma in Oregon alone at 3 billion. Medication costs are not well-controlled.[xxiv] These are likely low estimates since the increase in inhaler costs and medical costs in general have not been factored in adequately. List price for regular inhaler therapy for asthma and COPD is currently around $4,000-11,000 per year, not including rescue medications, doctor visits, etc. This will only worsen as more people move to the state, traffic congestion around the state worsens, and idling and air pollution by schools both urban and rural increases. For every dollar we invest in avoiding the diseases caused by diesel exhaust, we will reap many multiples in health benefits and the economic benefit of having healthy communities.

Dr. Erika Moseson, MD, MA
Pulmonary and Critical Care Medicine
President of Oregon Thoracic Society

References- There is a large wealth of data on the health effects of air pollution and diesel. These are a representative few with data for the testimony above, several particularly chosen for strength and reputation of journal (e.g. New England Journal of Medicine, American Journal of Respiratory and Critical Care Medicine, Lancet) as well relevance to Oregon. Please contact OTS and ALA if you would like to discuss further. ALA Oregon = InfoMTP@Lung.org; 503-924-4094.

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[1] Khreis et al. "Exposure to traffic-related air pollution and risk of development of childhood asthma: A systematic review and meta-analysis." Environ Int. 2017 Mar;100:1-31
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[1] Suglia et al. "Association of Black Carbon with Cognition among Children in a Prospective Birth Cohort Study." American Journal of Epidemiology, Volume 167, Issue 3, 1 February 2008, Pages 280–286,
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[1] Calderón-Garcidueñas L, Mora-Tiscareño A, Ontiveros E, Gómez-Garza G, Barragán-Mejia G, Broadway J, et al. 2008a. Air pollution, cognitive deficits and brain abnormalities: a pilot study with children and dogs. Brain Cogn 68:117–127.
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[1]Andersen ZJ et al/ Chronic Obstructive Pulmonary Disease and Long-Term Exposure to Traffic-related Air Pollution: A Cohort Study. *Am J Respir Crit Care Med.* 2011: 183: 455-461.
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[1] Peters A et al. Exposure to Traffic and the Onset of Myocardial Infarction. *N Engl J Med.* 2004; 351: 1721-1730.
[1] Finklestein MM et al. Traffic Air Pollution and Mortality Rate Advancement Periods. *Am J Epidemiol.* 2004; 160: 173-177; Hoek G, Brunkreef B, Goldbohn S, Fischer P, van den Brandt. Associations between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. *Lancet.* 2002; 360: 1203-1209.
[1] Oudin et al. "Traffic-Related Air Pollution and Dementia Incidence in Northern Sweden: A Longitudinal Study." Environ Health Perspect. 2016 Mar;124(3):306-12. doi: 10.1289/ehp.1408322.
[1] Yang WS. "An evidence-based appraisal of global association between air pollution and risk of stroke." Int J Cardiol. 2014;175:307–313.

[1] Prada et al. Association of air particulate pollution with bone loss over time and bone fracture risk: analysis of data from two independent studies. The Lancet Planetary Health , Volume 1 , Issue 8 , e337 - e347
[1] Qian et al. "Air Pollution and Mortality in the Medicare Population." New England Journal of Medicine. 29 June 2017.
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Comment categories linked to this comment: 1, 3, 5, 11

Comment Submittal #190 - LETTER
Name: Tori Heroux, Program Director
Organization: Neighbors for Clean Air

Comment text:
We urge DEQ to carefully consider the proposed Noncancer Hazard Indices. Neighbors for Clean Air (NCA) persists in the belief that the adoption of SB 1541's adjustment of existing source RALs represents a major weakness in DEQ's Health Risk Assessment (HRA) process. While we recognize that the agency is unable to change this element of the rules at this time, we urge the adoption of a hazard index value of 3 (rather than 5) wherever agency discretion allows to minimize the continued damage to human health. The precautionary principle should be followed here, particularly where there is any evidence of developmental harm or other severe effects on human health.

I. All 184 of the Listed Noncancer Toxic Air Contaminants Merit an HI of 3
All 184 toxic contaminants that have noncancer toxicity reference values should be regulated at a RAL of an HI of 3. As the Technical Advisory Committee concluded, "there is not a clear science-based way to distinguish the noncancer adverse health risk that should or should not be considered 'severe.'" DEQ even goes so far 1 as to state that [a]ll of these chemicals have an effect on one or more target organs/systems, which include kidney, liver, blood, endocrine system, musculoskeletal system, eyes, skin, central nervous system, peripheral nervous system, cardiovascular system, immune system, respiratory system, reproductive system, gastrointestinal system, and developmental effects. All of these effects can be considered to be potentially severe human health effects.2

Yet the agency chooses not to regulate 28 of these compounds at HI3, a level closer to what is protective of human health. While there may not be a clear-cut scientific definition of "severe" health impacts, the science is very clear about one thing: harm to human health begin to occur at levels higher than HI1. So we can anticipate that what happens to human health—particularly for sensitive populations—above HI3 would meet the reasonable person's standard of "severe" health impacts.

The agency has given no defensible rationale as to why 26 of these air toxics do not merit the lower and more health-protective standard of HI3.

Not only is Option 13 closer to health protective for the communities the Governor set out to protect when she initiated Cleaner Air Oregon Rulemaking,4 it is also the easiest and most practical solution.

Splitting these compounds into two separate noncancer lists is not reasonable because it would require more work from an agency with already overtaxed resources5 to calculate exceedance ratios rather than following the process already set out in the Cleaner Air Oregon rules.6 We urge the agency to adopt the most common sense solution, maintaining all 184 air toxics with noncancer TRVs at an HI of 3.

II. Diesel Particulate Matter (DPM) was Wrongly Left off the List of Toxics with Developmental or Other Severe Impacts Meriting an HI of 3

NCA wants to draw specific attention to the improper exclusion of this pollutant from the list meriting a lower and more health-protective HI. The severe and developmental noncancer impacts of DPM should not be discounted. There is no rationale given by DEQ for defining the health impacts of DPM as not "severe," or even nondevelopmental. DPM has known short term impacts to health7 and known developmental health effects8, severe reproductive health effects, and severe impacts on multiple target organs including 9 the brain, heart and lungs.10 DEQ cited to many of these health impacts in its own 2015 report, "Concerns about Diesel Engine Exhaust." The state of California Office of Environmental Health Hazard Assessment has listed diesel particulate among the five toxic air contaminants with the greatest harm to children.11 Studies have shown that the annual impacts of diesel pollution on Oregon's residents include at least 460 premature deaths, 145 non-fatal heart attacks, and over 25,000 work loss days.12

The impacts of DPM to human health would meet any rational definition of "severe" health effects. It seems clear that diesel PM is a pollutant that needs to be regulated at the lower, yet still insufficient, level of HI 3. This is only one example of the agency failing to use the discretion granted by SB 1541 to protect the health of Oregonians impacted by air pollution. Leaving some of the aforementioned 184 air toxics at a level that is less protective of human health is an abrogation of the duty of the agency to protect the health and environment of all Oregonians, including those who are more vulnerable to air pollution. While this is not the focus of this portion of the rules, NCA also would like to note the alarmingly high number used as the Toxicity Reference Value (TRV) for DPM: 5 micrograms per cubic meter (ug/m3). Oregon's benchmark for DPM is 0.1 μg/m3—thirty times less protective than the benchmark set by California, Washington and New Jersey: 0.0033 μg/m3. In comparison with these numbers, a TRV of 5 is shocking and merits explanation and critical reconsideration from DEQ.

III. Conclusion

NCA believes that the 26 toxic air contaminants (out of 182) that do not meet HI TAC criteria for having development or reproductive health effects should be regulated at an HI of 3 by designating the consequences of exposure as severe, according to the evidence presented by OHA and DEQ. Having no compelling scientific or administrative reason to exclude the remaining 26 air toxics from the list, the agency should accept the recommendation of its Technical Advisory Committee and amend the proposed rules to include all non-cancer air toxic contaminants be regulated at a HI of 3.

Thank you for this opportunity to provide comments on continued Cleaner Air Oregon rulemaking. These details are crucial to improving our state's protections of public health and the environment.

1 Overview of Hazard Index Rulemaking, Department of Environmental Quality, 3.
2 *Id* .
3 As defined by the agency during the Rules Advisory Committee (RAC), *id* . at 5-6.
4 https://www.youtube.com/watch?v=bPzSh0qGnNA .
5 As per the Oregon Secretary of State's Audit of DEQ: "DEQ struggles...due to a variety of factors, including competing priorities, vacancies, and position cuts that have created unmanageable workloads." *Department of Environmental Quality Should Improve the Air Quality Permitting Process to Reduce Its Backlog and Better Safeguard Oregon's Air* .
6 Overview of Hazard Index Rulemaking, Department of Environmental Quality, 7.

7 Sydbom A, Blomberg A, Parnia S et al., *Health Effects of Diesel Exhaust Emissions* . Eur Respir J. 2001 Apr;17(4):733-46.
8 Adar et al, Adopting Clean Fuel and Technologies on School Buses: Pollution and Health Impacts in Children, Respiratory and Critical Care Medicine, 2015.
9 Roberts, Andrea L., et al. "Perinatal air pollutant exposures and autism spectrum disorder in the children of nurses' health study II participants." *Environmental health perspectives* 121.8 (2013): 978-984.
10 U. S. Environmental Protection Agency. (2002). Health Assessment Document for Diesel Engine Exhaust. Washington, DC: National Center for Environmental Assessment, Office of Research and Development; State of Oregon. Department of Environmental Quality. *The Concerns about Diesel Engine Exhaust. Operations Division.* Portland. 2015.
11 CA EPA, OEHHA. (2001, October). Prioritization of toxic air contaminants under the Children's Health Protection Act. Retrieved March 31, 2014, from http://oehha.ca.gov/air/toxic_contaminants/pdf_zip/SB25%20TAC%20prioritization.pdf
Comment categories linked to this comment: 1, 3, 5, 10

Comment Submittal #191 - LETTER

Name: Paul Lewis /Nadege Dubuisson
Organization: Multnomah County Health Department

Comment text:
Please accept the following comments on the proposed permanent rule amendments to Chapter 340 of the Oregon Administrative Rules, relating to the establishment of more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts. These comments are submitted on behalf of Multnomah County. The bulk of these comments include restatements of comments made by Multnomah County on the topic of 'Non-Cancer Hazard Index' rulemaking, Section 7 of SB 1541, submitted by CAO Committee Member and Tri-County Health Officer Dr. Paul Lewis on July 29th, 2019.

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. As currently proposed, the proposed permanent rule amendments still fall short of protecting public health with 26 toxic air contaminants still not regulated at a Risk Action Level (RAL) with HI benchmark of 3. When presented by DEQ with two options for adjusting hazard indices based RALs in July 2019, Multnomah County supported regulating all 182 chemicals with a hazard index of 3. We still support this option because it is the most health protective. **While we recognize that 156 chemicals on the list fall within the HI of 3, we still encourage that DEQ adopt all 182 non cancer toxic air contaminants be regulated at a risk action level with hazard index benchmark of 3 into the final rule.**

The original rules, as proposed by the agency, set a 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 current state law, 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. From the public health standpoint, an industrial site emitting air pollutants with a known Hazard Index greater than 1 without using optimal pollution controls is concerning; operating at a level over 3 is disturbing; allowing a HI of 5 is not defensible from cautious science, from the recommendations from the Technical Advisory Committee (TAC) nor the missions of DEQ, OHA, and the Multnomah County Health Department.

We urge DEQ to remain faithful to its mission to restore, maintain and enhance the quality of Oregon's air, land and water, while being guided by values of public service, health, safety and wellness1. 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."2

We recommend 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.

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. Depending on the type, magnitude and duration of the exposure, multiple systems can be severely impacted and cause temporary or permanent harm, injury or disability. An additional consideration when establishing rules that allow the release of toxic pollutants that could cause harm is the potential impact of such uncertainty in creating distress for community members. As we have mentioned before, alongside Environmental Quality Commission members, one can imagine that a parent knowing that their child has been exposed to a dangerous chemical could reasonably be expected to label such an exposure and impact as severe.

Severity can also depend on the recipient of the dose. 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."

As just one example of a disconnect between the method for assigning a chemical to a designated risk level based on severity of health impact, diesel particulate matter is listed on the list of chemicals to be regulated at a HI of 5, meaning it is absent from the list of air toxics anticipated to cause reproductive, developmental, or severe health impacts. Diesel PM has known short term impacts to health3 and known developmental health effects4, severe reproductive health effects5, and severe impacts on multiple target organs including the brain, heart and lungs.[6,7]. In DEQ's own 2015 report *"Concerns about Diesel Engine Exhaust"*, exposure to diesel particulate matter is cited as contributing to heart disease and premature death and associated with respiratory disease, nervous system effects and low birth weight[8]. Diesel PM is known to have a detrimental effect on workers who are routinely exposed to emissions[9,10]. The increased risk for asthma prompted the state of California Office of Environmental Health Hazard Assessment to list diesel particulate among the five toxic air contaminants with the greatest harm to children[11]. Studies have shown that the annual impacts of diesel pollution on Oregon's residents include at least 460 premature deaths, 145 non-fatal heart attacks, and over 25,000 work loss days[12]. These are severe health effects. It seems clear that diesel PM is a pollutant that needs to be regulated at the lower, yet still insufficient, level of HI 3.

We all rely on DEQ to protect the health of all Oregonians, but the most vulnerable are especially in need of DEQ's utmost protection. The 26 toxic air contaminants (out of 182) that do not meet HITAC criteria for having development or reproductive health effects should be regulated at an HI of 3by designating the consequences of exposure as severe, according to the evidence presented by OHA and DEQ. Having no compelling scientific or administrative reason to exclude the 26 "orphaned-toxic" chemicals from the list, the agency should accept the recommendation of its Technical Advisory Committee and amend the proposed rules to include all non-cancer air toxic contaminants be regulated at a HI of 3.

1 https://www.oregon.gov/deq/about-us/pages/default.aspx
2 https://www.youtube.com/watch?v=bPzSh0qGnNA&feature=youtu.be
3 Sydbom A, Blomberg A, Parnia S et al., *Health Effects of Diesel Exhaust Emissions*. Eur Respir J. 2001 Apr;17(4):733-46.
4 Adar et al, Adopting Clean Fuel and Technologies on School Buses: Pollution and Health Impacts in Children, Respiratory and Critical Care Medicine,2015.
5 Roberts, Andrea L., et al. "Perinatal air pollutant exposures and autism spectrum disorder in the children of nurses' health study II participants."*Environmental health perspectives* 121.8 (2013): 978-984.
[6]U.S.EnvironmentalProtection Agency. (2002). Health AssessmentDocumentfor DieselEngine Exhaust.Washington,DC: NationalCenterfor EnvironmentalAssessment,Officeof Research and Development.[7]State of Oregon. Department ofEnvironmental Quality.*The Concerns about Diesel EngineExhaust.OperationsDivision.*Portland. 2015[8]https://www.oregon.gov/deq/FilterDocs/DieselEffectsReport.pdf[9]National Institute forOccupationalSafety and Health,*Nationaloccupational exposure survey, 1981-1983: estimated totaland female employees, actual observation and trade-named exposure to products ofcombustion--diesel fuels,*1983. Cincinnati, OH:U.S. Department ofHealth and Human Services, Public Health Service,Centers for Disease Control, National InstituteforOccupationalSafetyand Health.[10]Garshick,Eric, etal. *Lung cancerand vehicle exhaust in trucking industryworkers.*Environmental Health Perspectives (2008): 1327-1332.[11]CA EPA, OEHHA. (2001, October). Prioritization oftoxic aircontaminants underthe Children's Health Protection Act. RetrievedMarch 31,2014, fromhttp://oehha.ca.gov/air/toxic_contaminants/pdf_zip/SB25%20TAC%20prioritization.pdf[12]https://www.oregon.gov/deq/FilterDocs/DieselEffectsReport.pdf
Comment categories linked to this comment: 1, 2, 3, 5, 8

Comment Submittal #192 - LETTER
Name: Giffe Johnson
Organization: National Council for Air and Stream Improvement, Inc. (NCASI)

Comment text:
On behalf of its members, NCASI appreciates the opportunity to comment on the Cleaner Air Oregon Hazard Index Rulemaking. NCASI conducts research and technical studies on behalf of forest products companies across the US, and its members represent nearly 90% of pulp and paper and two-thirds of wood panels produced nationwide. Most forest products facilities operating in Oregon are NCASI members. Over its 76-year history, NCASI has conducted studies in a variety of areas related to air emissions and worked extensively in developing emissions data used in multiple National Emissions Standards for Hazardous Air Pollutants (NESHAP) rulemakings affecting this industry. NCASI also assisted EPA during the development and implementation of the 2011 Pulp and Paper Information Collection Request (ICR), which was used by EPA as part of the Residual Risk and Technology Review (RTR) of the pulping, bleaching and wastewater MACT ("Subpart S") and the pulp mill chemical recovery NESHAP ("Subpart MM").

As part of its Health Effects program, NCASI has historically focused on occupational and community health risk assessment for substances of interest to the forest products industry, such as hydrogen sulfide, formaldehyde, chloroform, and particulate matter. NCASI's current research includes assessment and development of approaches for the derivation of air quality standards.

These comments relate specifically to the proposal to reduce the enforceable Hazard Index (HI) from 5 to 3 for substances classified as having reproductive or developmental toxicity in order to provide additional protection to fetuses and children. 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 target 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 and only substances for which toxicity values are based on reproductive and/or developmental outcomes should be considered for a reduced HI. For substances that are regulated based on endpoints other than reproductive or developmental toxicity even though they are designated as having potential 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.

For instance, carbon disulfide currently has a TRV of 800 ug/m3. At a HI of 5, the target concentration is 4,000 ug/m3. However, this TRV is based on a neurological endpoint, not a reproductive or developmental endpoint. If a toxicity value based on developmental toxicity is used and then adjusted to a HI of 3, the target concentration remains higher than the original TRV with an HI of 5 (Table 1). Values in Table 1 were derived using potential No Observable Adverse Effect Levels (NOAEL) and Uncertainty Factors (UF) described in US EPA IRIS and OEHHA, respectively.

Table 1. Evaluating Carbon Disulfide as a neurotoxicant and a developmental toxicant.

CARBON DISULFIDE		
CAO TRV (based on neurological endpoint)	800	micrograms per cubic meter (ug/m3)
Concentration at HI 5*	4,000	ug/m3
*This is the current standard.		ug/m3
EPA IRIS		
NOAEL for Developmental Effects	1,244,000	ug/m3
Calculated RfC [(NOAEL/(UFx10)]	12,440	ug/m3
Concentration at HI 3	37,320	ug/m3
OEHHA		
NOAEL for Developmental Effects	50,000	ug/m3
Calculated RfC [(NOAEL/(UFx10)]	5,000	ug/m3
Concentration at HI 3	15,000	ug/m3

Applying an HI of 3 to the original, neurological endpoint based TRV produces a target 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 substance toxicity factors that are not based on reproductive or developmental outcomes is arbitrary, not scientific, and most importantly inconsistent with the intended goal of providing additional public health benefit. In order to specifically address these outcomes, HI values should relate directly to the toxicological endpoint of interest. As demonstrated in the above example, for many substances, regulating to an HI of 3 using 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. It is not a defensible use of risk assessment science to reduce an HI based on a non-target endpoint that does not occur at the lowest dose relative to other outcomes.

Comment categories linked to this comment: 27

Comment Submittal #193 - LETTER

Name: Tom Wood
Organization: Oregonians for Fair Air Regulations (OFAR)

Comment text:

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 approximately250,000 employees, including nearly 75,000 manufacturing jobs. This coalition of Oregon businesses submitted comments during the Cleaner Air Oregon ("CAO") Hazard Index 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 because DEQ's proposed regulations are inconsistent with the statutory language approved by the Legislature in 2018 in Senate Bill 1541 ("SB 1541 "). This letter provides further detail about those concerns.

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. As outlined below, DEQ's October 25, 2019 rule proposal is inconsistent with the Legislature's clear intent. SB 1541 mandates that DEQ adopt a source-specific approach that addresses only those unusual chemicals that, when emitted by a specific source, present a unique risk that is not adequately safeguarded against by the existing program. Instead, DEQ has proposed wholesale reductions in the Hazard Index, affecting 156 of the 182 chemicals with non-cancer Toxicity Reference Values ("TRVs") and all existing sources that emit one or more affected chemicals. This causes us great concern. We request that DEQ reconsider its approach and revise its proposal so that it is consistent with the statute.

Oregonians for Fair Air Regulations 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 authority for the Hazard Index rulemaking is found exclusively in 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 rule 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 describes 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. 1 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 Hazard Index 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.

Notwithstanding this clear statutory directive, DEQ has proposed rules that directly contravene SB 1541. DEQ's proposal ignores the source-specific process outlined by the Legislature, and, instead, applies a "one size fits all" approach that automatically reduces the Hazard Index for all existing Oregon sources subject to CAO, without exception and without reference to source-specific standards and criteria. DEQ's proposal is 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 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 non-cancer benchmarks for all sources is plainly inconsistent with the statute. We are concerned that DEQ has chosen to ignore the unambiguous Legislative restrictions imposed on the Hazard Index rulemaking in favor of an unauthorized move to shift the vast majority of 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.

Comment categories linked to this portion of the OFAR comment letter: *17*

SB 1541 Requires a Source-Specific Analysis of Emissions

We are equally concerned that the proposed rules are inconsistent with the clear Legislative intent that DEQ perform a source-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 EOC 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 specific and unequivocal. DEQ must determine whether a 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. If, and only if, DEQ makes that source-specific finding, may the agency then move to the second stage of the assessment, to determine whether it is appropriate to adjust the benchmark for that specific source. Section 7(1) reinforces the structure established in Section 7(3)(a) by which the EQC adopts the procedure (including specific standards and criteria) for considering on a source-specific basis whether to reduce the benchmark from 5. A critical aspect of the statute is that DEQ must individually assess a source to determine whether it is necessary and appropriate to reduce the benchmark in that specific case. DEQ's proposed rules would eliminate the source-specific assessment mandated by SB 1541.

Comment categories linked to this portion of the OFAR comment letter: *18*

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 non-cancer 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.

DEQ's proposal is inconsistent with its own statements in earlier rulemakings. DEQ cannot reasonably propose that almost every chemical with a non-cancer RBC is "expected to have" a severe effect without a benchmark adjustment. In its own response to public comments on the 2018 CAO rules, DEQ stated that the CAO rules were written "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." Given that the RBCs were already set to ensure protection of the most sensitive endpoints in sensitive populations, it is not credible for the agency to now say that it must almost double the stringency of the program as it relates to non-cancer impacts in order to avoid severe effects.

Comment categories linked to this portion of the OFAR comment letter: *19*

SB 1541 Does Not Authorize Reducing the Benchmark Unless the RBC is Based on Developmental Impacts
DEQ's Notice of Proposed Rulemaking states that the proposal would reduce the benchmark from 5 to 3 based on developmental health effects even if the TRV was not based on developmental health effects. Such an approach is flatly inconsistent with SB 1541. Based on this approach, a chemical such as acetaldehyde, for which the non-cancer 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. 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 plain words of the statute, a benchmark may 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 inappropriately divorces the benchmark from the TRV derivation process.

Comment categories linked to this portion of the OFAR comment letter: *20*

SB 1541 Does Not Extend to Reproductive Effects
The proposed rules inappropriately assume that the reference to developmental impacts in Section 7(1)(a) included reproductive effects. As stated in the Notice of Proposed Rulemaking, 116 chemicals are proposed to have their benchmark reduced to 3 "because they are expected to have reproductive effects." DEQ rationalizes this approach by suggesting that "Reproductive human health effects are closely related to developmental health effects." However, such an approach is inconsistent with SB 1541. 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 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.2

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 order to be consistent with the statute, 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.

Comment categories linked to this portion of the OFAR comment letter: *21*

Impacts on Multiple Target Organs Does Not Justify A Benchmark Reduction
DEQ's Notice of Proposed Rulemaking states that 63 chemicals are proposed to have their benchmarks reduced from 5 to 3 based on the chemical's TRV being based on effects to more than one target organ. SB 1541 clearly states the basis for a benchmark reduction as being either a demonstration of developmental human health effects or other severe human health effects. Nowhere does the statute authorize DEQ to reduce the benchmark simply because the TRV was based on effects to more than one target organ. One cannot simply equate effects on more than one target organ to mean severe human health impacts without further analysis. DEQ's proposal is inconsistent with the statute and should be revised.

Comment categories linked to this portion of the OFAR comment letter: *22*

The Proposed Rules Must Consider the Most Current Science
DEQ has 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. The spreadsheet 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 inappropriate and scientifically unsound conclusions.

SB 1541 does not authorize DEQ to ignore the best science and DEQ's steadfast resistance to consider the most up to date toxicological information actively harms the public. 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 cause DEQ to reconsider the viability of its approach, not be used as an excuse to ignore good science. For example, as explained in the excellent comments submitted by the American Chemistry Council, recent research on diisocyanates demonstrates that these chemicals do not pose a significant human hazard for developmental toxicity. As a result, there is no rational basis for reducing the benchmark for these chemicals from 5 to 3. The American Chemistry Council comments are consistent with the comment made by one of the TAC members that, "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." These comments reflect that the rulemaking has failed to account for good science and that the proposed rules should be revised to reflect the best information available to DEQ. A benchmark should not be changed unless the best scientific information indicates that a change is necessary in order to avoid a risk not already addressed through the uncertainty factors.

Comment categories linked to this portion of the OFAR comment letter: *12, 23*

The Technical Advisory Committee Process Was Inadequate
Section 7(b) of SB 1541 requires that, before adopting rules allowing for Hazard Index benchmark adjustments, "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."

We are concerned this statutory requirement has not been satisfied. From DEQ's Notice of Proposed Rulemaking, one is left with the impression that DEQ provided the TAC sufficient time and information to allow the TAC to develop recommendations for DEQ and EQC's consideration. Yet, that is not the case. The TAC's ability to provide recommendations was compromised, as DEQ allowed just two meetings for the TAC to consider the non-cancer effects of over two-hundred separate chemicals. The TAC's ability to provide recommendations was further frustrated by the inadequate amount of time that DEQ gave the TAC to evaluate the "all-in-one" spreadsheet that the agencies prepared to show the non-cancer effects of the chemicals being assessed for HI adjustment. In fact, DEQ failed to even provide the TAC with an updated spreadsheet for committee consideration ahead of the second and final meeting of the TAC on December 4, 2018. Following that meeting, two of the seven TAC members submitted comments to DEQ to express their professional concern. One noted that"[c]ommittee members were not given enough time or resources to complete the important work to satisfy the statutory purposes .... "[3]. The other commenting committee member agreed, observing that "[t]he committee has not been provided sufficient direction, resources, or time in which to make recommendations to fulfill its statutory purpose."[4] The comments of these TAC members reveal that the TAC process conducted by DEQ was insufficient to allow the TAC to complete the requisite, scientifically-rigorous work required by SB 1541.

Comment categories linked to this portion of the OFAR comment letter: *24*

The Risk Determination Ratio Approach is Sound
We want to note our support of the practical approach proposed by DEQ for weighting impacts for a facility that emits toxics that are subject to more than one benchmark. 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 revision in its proposal.

Comment categories linked to this portion of the OFAR comment letter: *25*

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 request that the Department 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 Iist should reflect the best science, verified by an adequate process involving input and recommendations from persons with technical expertise, 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 chemicals benchmark should not be reduced. 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 chemicals emitted by those sources. Although this structure is mandated by SB 1541, it is absent from DEQ's rule proposal. DEQ's rules must reflect the mandated statutory structure and yet the proposal does not do so. 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.

Comment categories linked to this portion of the OFAR comment letter: *26*

1 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.

2 Comment letter submitted by Dr. Kathryn Kelly dated February 28, 2019, available at https://www.oregon.gov/deq/Rulemaking%20Docs/caohitaccomments.pdf.
3Comment Jetter submitted by Dr. Neeraja Erraguntla, received by DEQ on December 14, 2018, https://www.oregon.gov/deg/Rulemaking%20Docs/caohitaccomments.pdf.

4 Comment letter submitted by Dr. Kathryn Kelly dated February 28, 2019, av.

Comment Submittal #194 - LETTER
Name: Mariah Dula
Organization: Northeast Coalition of Neighborhoods

Comment text:
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. The Northeast Coalition of Neighborhoods represents 12 neighborhoods of inner North and Northeast Portland. Our district boundaries are positioned between major freeways and travel corridors, in addition we host a high concentration of unfiltered diesel equipment.

The people who live, work, and attend school in our coalition boundaries are exposed to a high level of air contaminants that have severe health impacts on our community. **We request that DEQ accept the recommendation of the Technical Advisory Committee and include all noncancer air toxic contaminants at the HI3 protective level.**

All 184 of the Listed Noncancer Toxic Air Contaminants have an effect on one or more organs and systems in our bodies and can be considered severe by standard definition of the term.

Listing all 184 chemicals at the HI 3 health proactive level comports with the mandate of Senate Bill 1541. The bill expressly directed DEQ to establish more protective health standards for noncancer toxic air contaminants that are expected to cause developmental or other severe human health impacts.
Comment categories linked to this comment: 1, 3, 5, 11

Comment Submittal #195 - LETTER

Name: Kathryn VanNatta
Organization: Northwest Pulp & Paper Association.

Comment text:
RE: Proposed permanent rule amendments to chapter 340 of the Oregon Administrative Rules regarding Cleaner Air Oregon Hazard Index provisions related to parameters and requirements for proposed rules set forth in Senate Bill 1541 (2018).

Thank you for the opportunity for the Northwest Pulp & Paper Association (NWPPA) to provide comment on the Oregon Department of Environmental Quality's (DEQ) Cleaner Air Oregon (CAO) Hazard Index Rulemaking and allowing NWPPA to serve as a member of the Rules Advisory Committees for both the CAO program and the Hazard Index rules.

Comment 1
NWPPA reiterates our verbal comments in the Rules Advisory Committee meetings and in written comment in the preliminary rule process -- that emphasize that NWPPA believes the rule proposal is inconsistent with and, in fact, greatly expands the legislative intent and written statutes contained in Senate Bill 1541 (2018) related to regulatory application of the Hazard Index in the Cleaner Air Oregon program.

Suggested Remedy
DEQ should review and implement the suggested alternatives and remedies from Dr. Giffe Johnson and of Thomas Wood referenced below.

Comment 2
NWPPA supports and incorporates by reference the written comments of Dr. Giffe Johnson of NCASI dated November 22, 2019.

Comment 3
NWPPA supports and incorporates by reference the written comments of Thomas Wood spokesman for the Oregonians for Fair Air Regulations dated December 18, 2019.
Comment categories linked to this comment: 12, 17- 28

Comment Submittal #196 - LETTER

Name: Sharla Moffett
Organization: Oregon Business & Industry (OBI)

Comment text:
Thank you for the opportunity to comment on DEQ's Cleaner Air Oregon Hazard Index (HI) rulemaking. 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. OBI commented previously on the Hazard Index during the rulemaking advisory committee process that this proposal overstepped SB 1541, which authorized the Cleaner Air Oregon program. Unfortunately, this same approach was used in the proposed regulation. Overall, we remain extremely concerned that DEQ's proposal to reduce the Hazard Index for 156 chemicals from 5 to 3 is inconsistent with both the statute and the legislative intent.

The language in SB 1541 was intended to provide a process in which specific air toxics could be considered for benchmark adjustments once the Environmental Quality Commission had established standards and criteria for determining what the benchmark should be for that contaminant at a specific air contamination source (Section (3)(a)). It is difficult to see ambiguity in this section of the bill, which reads "The commission shall adopt rules necessary to implement this section" and "Before adopting rules under this section, the commission shall establish and consider the recommendations of an advisory committee…"

Instead of accessing the regulatory flexibility provided in the law, DEQ has applied a uniform approach to toxics that results in adjusting the benchmark for 156 chemicals irrespective of the contaminant, facility, geography or other local, site-specific conditions.

In addition to the statute's directive to employ both a contaminant-specific and source-specific approach, the law 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 should view it and implement it as a serious and specific consideration. In contrast, the proposed "one size fits all" approach does not seem to give appropriate weight to the statute's language.

We remain concerned 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.

Additionally, OBI fully supports the comments submitted by Oregonians for Fair Air Regulations (the coalition) and particularly its conclusion that DEQ be consistent with SB 1541 by retaining the current

benchmarks until rules setting standards and criteria can be adopted to evaluate each contaminant. The coalition raises other numerous issues that must be addressed before the proposed rule is submitted to the EQC for adoption.

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.

Footnotes:
1 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.
2 Comment letter submitted by Dr. Kathryn Kelly dated February 28, 2019, available at https://www.oregon.gov/deq/Rulemaking%20Docs/caohitaccomments.pdf.
3Comment Jetter submitted by Dr. Neeraja Erraguntla, received by DEQ on December 14, 2018, https://www.oregon.gov/deg/Rulemaking%20Docs/caohitaccomments.pdf.
4 Comment letter submitted by Dr. Kathryn Kelly dated February 28, 2019, available at https://www.oregon.gov/deg/Rulemaking%20Docs/caohitaccomments.pdf.
Comment categories linked to this comment: 12, 17- 28

Comment Submittal #197 - LETTER
Name: Damon Motz-Storey
Organization: Physicians for Social Responsibility

Comment text:
Oregon Physicians for Social Responsibility (PSR) is a statewide organization of more than 2000 health professionals and public health advocates working to protect human health from the gravest threats to health and survival. We have a 38-year history of advocating for environmental health for all Oregonians.

We are submitting comments because of our grave concerns about the inadequacy of the proposed rules in protecting public health and the permissiveness to industry demonstrated by the proposed Hazard Index rules. We incorporate by reference the comments of the Multnomah County Health Department submitted on this matter on November 22, 2019.

We are concerned that the proposed rules are inadequate in that they do not consider the adverse effects of exposure to endocrine disrupting chemicals (EDCs) that have well known and well documented adverse effects on reproduction and development. There is no mention of endocrine disrupting chemicals in the documents providing the basis for this rulemaking, only a cursory mention of effects on the endocrine system as a target organ like any other, when in fact there is growing consensus in the scientific community that chemicals acting through this mechanism do not exert their effects in a simple dose response manner. Furthermore, "…chemicals with hormonal activity can have effects at external doses that are often considered safe by the regulatory community." [1],[2] EDCs exert their adverse effects at levels of ambient exposure that were previously not thought to be harmful, that is, at reference concentrations

1 Linda Birnbaum. 2012. Environmental chemicals: evaluating low dose effects. Environmental Health Perspectives 120(4):A143-4.
2 Laura N. Vandenberg, Theo Colborn, Tyrone B. Hayes et al. 2013. Regulatory decisions on endocrine disrupting chemicals should be based on the principles of endocrinology. Reproductive Toxicology 38:1-15.

(RfCs). Because DEQ bases the Hazard Index of 1 for each air contaminant on previously established reference concentrations and these do not represent a 'safe' dose for endocrine disrupting chemicals which can have adverse effects on reproduction and development at the reference concentration, the proposed rules for hazard indices fail to regulate on the basis of current scientific understanding an entire class of toxic air contaminants.

We are also concerned that there are errors in DEQ's categorization of chemicals as non-cancer causing when the evidence for their potential to cause cancer is well documented. For example, from the list of 26 toxic air contaminants that DEQ does not expect to have developmental or other severe health effects:

- acrolein is a bladder and lung carcinogen,[3]
- crystalline silica is a known human carcinogen,[4]
- strong acid mists containing sulfuric acid (including Oleum, fuming sulfuric acid) are carcinogenic,[5] and
- vinyl bromide is classified by the EPA as a probable human carcinogen.[6]

Furthermore, the list of 26 toxic air contaminants not expected by DEQ to have developmental or other severe health effects includes acrolein, fuming sulfuric acid, glutaraldehyde, difluoroethane, and hexamethylene diisocyanate. Please understand that:

- acrolein forms DNA adducts and inhibits DNA repair, and can cause acute lung injury and chronic obstructive pulmonary disease (COPD) and may cause asthma;[7],[8]
- potential symptoms of overexposure to fuming sulfuric acid (oleum)are eye, skin, nose and throat irritation, pulmonary edema, bronchitis, emphysema, conjunctivitis, stomatitis, dental erosion, tracheobronchitis, skin and eye burns, dermatitis;[9]
- exposure to glutaraldehyde may cause throat and lung irritation, asthma and difficulty breathing, dermatitis, nasal irritation, sneezing, wheezing, burning eyes, and conjunctivitis;[10]
- exposure to difluoroethane can cause irritation of the skin, eyes, nose, throat and lungs causing pulmonary edema;[11]
- hexamethylene diisocyanate can cause pulmonary edema, coughing, and shortness of breath.[12]

3 Moon-shong Tang, Hsiang-tsui Wang, et al. 2011. Acrolein induced DNA damage, mutagenicity and effect on DNA repair. Mol Nutr Food Res. 55(9): 1291–1300.
4 National Toxicology Program. Silica, Crystalline (Respirable Size), Report on Carcinogens, 14th Edition. Research Triangle Park, NC: National Institute of Environmental Health Sciences, 2016.
5 Toxnet, HSDB Database. Oleum CASRN 8014-95-7 https://toxnet.nlm.nih.gov/cgibin/sis/search/a?dbs+hsdb:@term+@DOCNO+1236
6 https://www.epa.gov/sites/production/files/2016-09/documents/vinyl-bromide.pdf
7 Moon-shong Tang, Hsiang-tsui Wang, et al. 2011. Acrolein induced DNA damage, mutagenicity and effect on DNA repair. Mol Nutr Food Res. 55(9): 1291–1300.
8 Bein K, Leikauf GD. (2011) Acrolein - a pulmonary hazard. Mol Nutr Food Res 55(9):1342-60. doi: 10.1002/mnfr.201100279.
9 Toxnet, HSDB Database. Oleum CASRN 8014-95-7 https://toxnet.nlm.nih.gov/cgibin/sis/search/a?dbs+hsdb:@term+@DOCNO+1236
10 https://www.cdc.gov/niosh/topics/glutaraldehyde/default.html
11 https://nj.gov/health/eoh/rtkweb/documents/fs/0715.pdf
12 https://www.epa.gov/sites/production/files/2016-09/documents/hexamethylene-diisocyanate.pdf

Astoundingly, included in this DEQ list of toxic air contaminants *not* expected to have developmental or other severe health effects is diesel particulate matter! Please accept our attached fact sheets on the adverse health effects of exposure to Particulate Matter in which we present current scientific evidence on the adverse effects of exposure to diesel particulate matter on development as well as cardiovascular, pulmonary and other systems.

It is baffling how DEQ can characterize these air contaminants as not having severe health effects. COPD, asthma, and pulmonary edema are life threatening health effects. Under what definition are they not severe? We have not reviewed the whole list to determine where there are other misclassifications of air contaminants, but simply present these as evidence of the shortcomings of DEQ's analysis and conclusions on the assignment of Hazard Indices.

We agree with the comments submitted by the Multnomah County Department of Health and strongly urge DEQ to accept the recommendation of its own HI Technical Advisory Committee and amend the proposed rules to include the 26 'orphaned-toxic' chemicals in those regulated at a Hazard Index of 3 as the most health protective permitted by current state law.

Finally, if, as DEQ staff have stated, "the overarching goal of Cleaner Air Oregon is to protect the public from exposure to toxic air contaminants emitted from industrial facilities", then Cleaner Air Oregon has failed to meet that goal. The proposed rules do not and cannot prevent exposure to toxic air contaminants by this method as long as emissions are permitted that exceed a Hazard Index of 1.

Thank you for this opportunity to provide comments.

Kelly Campbell, Executive Director
Damon Motz-Storey, Healthy Climate Program Director
Lluvia Merello, Energy Justice Organizer
Theodora Tsongas, PhD, MS, Environmental Health Working Group

Oregon Physicians for Social Responsibility

Attachments (3):
Airborne Particulate Matter and Public Health Factsheet
Diesel Exhaust & Neurodevelopmental Disorders Resources
Diesel, Small Particulate Matter and Public Health Factsheet
https://www.oregonpsr.org/environmental_health_factsheets
Comment categories linked to this comment: 1, 3, 5, 8, 16

Comment Submittal #198 - LETTER

Name: Senator Betsy Johnson
Affiliation: State Senator, Columbia, Clatsop, Portions of Tillamook, Washington, and Multnomah Counties, Oregon State Senate

Comment text:
I am sending this letter to express my concern regarding DEQ's implementation of the Cleaner Air Oregon {CAO) program. I list some of my specific issues below but am generally concerned that your agency appears intent on circumventing the legislative sideboards established in-5B 1541. You were personally involved in the discussions that resulted in.SB:1541 and I expect you to insist on your staff acting consistent-with what was negotiated and adopted into law.

My first concern is that DEQ is ignoring the clear intent of the statute to establish the non-cancer benchmark at 5 except in the unusual case where it is determined that a specific company is emitting a specific chemical in a manner that is expected to have developmental impacts or other severe human health impacts. This provision was not a delegation of authority to DEQ to change all or virtually all of the benchmarks to the lowest level. Yet that is precisely what DEQ has done. Your staff asked its Rulemaking Advisory Committee to consider a proposal whereby EVERY chemical would have its benchmark dropped from 5 to 3 in flat contradiction of the statute. After pushback from the regulated community, your staff pared this proposal back ever so slightly so that "just" 156 out of 182 chemicals (86%) would have their benchmarks curtailed. This does not indicate respect for legislative intent. This provision of SB 1541 was intended to be used in the unusual case where DEQ identified a specific bad actor chemical and where the extensive protections already built into the program were inadequate to address the threat in relation to a particular facility. In other words, this was a safety valve. However, your staff have ignored this intent and used the provision to bypass the clear legislative mandate to set the benchmark at 5 except in the unusual situation where an extreme risk was identified.

In addition, your staff chose to ignore the clear two-step process laid out in SB 1541. The statute requires DEQ to follow a specific process. First, DEQ is to establish a list of chemicals for which DEQ [11] may apply" a reduced benchmark. Second, DEQ is authorized to establish standards and criteria for determining when DEQ may adjust the benchmarks for an individual source. Clearly, neither step of this process authorizes DEQ to impose reduced benchmarks on every company in the state. The statute anticipates a process that would allow DEQ to reduce the benchmark under unusual circumstances where there was a significant risk posed for a particular chemical coming from a particular company that was going unaddressed by the program. Instead, your staff have proposed to impose the more stringent process on all sources regardless of circumstances. This approach is contrary to the clear wording of the statute.

In addition to the issues associated with the Benchmark Rulemaking, I understand that your staff are imposing requirements through guidance that are inconsistent with SB 1541. For example, it has come to my attention that while you are using an EPA computer model that EPA itself says can be off by as much as 50% and that the "time and location" of any impact cannot be accurately predicted, you are requiring that companies be judged on statistical outliers rather than statistically significant values. DEQ does not hold itself to this standard, but DEQ is insisting that companies be judged by the highest computer modeled number regardless of whether it is representative of any impact. That is punitive and contrary to good science. Similarly, DEQ is requiring that sources publish impact maps that strongly suggest that the EPA computer model can predict precise times and locations of impacts. This ignores EPA's own statement that its model is no good at such precision. DEQ's disregard of science will misinform communities and cause concern where none is merited.

In its guidance documents, DEQ is also telling companies that they have to make huge investments in control equipment based on theoretical impacts that happen in the middle of agricultural fields and forest lands. Yet the Legislature clearly said that DEQ was to apply the benchmarks where "people actually live or normally congregate." No farmer or forester is going to allow people to congregate in a field or forest and stand there waiting for impacts to occur. To the extent that there are workers in a field or forest, they do not remain in one place for a significant period of time. This, again, is a clear example of your staff implementing guidance contrary to the Legislature's clear direction.

DEQ has only that authority granted it by the Legislature. It is not the policy making body of government, it is the implementing arm. Your staff's job is not to thwart legislative intent, but to follow the Legislature's clear direction. SB 1541 established clear legislative intent and DEQ must act accordingly.
Comment categories linked to this comment: 1, 12, 17-28

Comment Submittal #199 - LETTER
Name: Dr. Neeraja Erraguntla
Affiliation: American Chemistry Council

Comment text:
The American Chemistry Council1 (ACC) Olefins Panel 2 appreciates the opportunity to provide comments on Oregon Department of Environmental Quality's (Oregon DEQ) proposed rule changes as they relate to 1,3-butadiene (CAS # 106-99-0).

Oregon DEQ's Toxicity Reference Value (TRV) for 1,3-butadiene is based on the California Office of Environmental Health Hazard Assessment (OEHHA) Chronic Reference Level (REL) of 2 μg/m3, which was developed in 2013. The Texas Commission on Environmental Quality's (TCEQ) 2008 assessment of 1,3-butadiene3 is much more comprehensive for both cancer and non-cancer endpoints when compared to the 2013 OEHHA assessment. TCEQ derived a chronic reference value (ReV) of 33 μg/m3 in 2008, underwent a peer-review and also updated the assessment with a 24-hour ReV in 2015. The TCEQ assessment also underwent peer-review by a third-party Peer-Review Panel and the Peer-Review Report and the Final Development Support Document is available for review and can be accessed at https://www.tera.org/Alliance%20for%20Risk/ARA_Projects_%201,3_Butadiene.htm

During the October 23, 2018 Oregon DEQ's Hazard Index Technical Advisory Committee (Committee) meeting agency staff informed the committee members that they would only evaluate chemicals by reference to toxicological information produced by a limited set of "authoritative sources." Those sources, identified in the new Cleaner Air Oregon (CAO) rules, were consulted by Oregon DEQ in establishing the TRVs. Without commenting on how the TRVs were set, in order to achieve its purpose, the Committee must look beyond the TRVs to support recommendations about which chemicals have potential non-cancer effects that could merit Hazard Index reduction.

The Committee must have access to and must consider the best available science and toxicological information. In addition to the identified authoritative sources, other sources should also be included, for example, guidance for developing toxicity factors and chemistry specific development support documents prepared by Texas Commission on Environmental Quality (TCEQ) whose evaluations have been used by public health agencies in other states (e.g., North Carolina and Michigan) and countries (e.g., Health Canada) conducting toxicological reviews and risk assessments. Additional information on the guidance and other information can be found at https://www.tceq.texas.gov/toxicology

The Committee has been asked to recommend standards and criteria to evaluate whether a given chemical's toxicity warrants a Hazard Index reduction. However, the Committee was not directed to carefully review the available information on the specific toxicity of each chemical under consideration. To meet its statutory purposes, the Committee should be encouraged to evaluate the best available science for each potentially relevant chemical. A careful approach is needed to assess the many elements (e.g., dose-response relationship, point of departure, magnitude of response, and degree of uncertainty) that can affect a chemical's toxicity. The current process of adjusting the Hazard Index does not take into account the nature or magnitude of the responses for the effects identified for a given chemical.

The Committee must be given the time necessary to carefully review all of the relevant toxicological information. Each evaluation must consider numerous variables, and various forms of uncertainty.

In summary, the default Hazard Index should be adjusted for a given chemical based on the best available science taking into consideration the weight-of-evidence and the magnitude of the identified effect. Additionally, the process should be clear, transparent, and systematic.

Additional References on Mode-of-Action (MOA) and Dose-Response Analysis that can improve the Understanding for 1,3-butadiene's Ovarian Effects. Further, as a result of an US Environmental Protection Agency (EPA) sponsored initiative to modernize risk assessment methodology in producing the National Academy of Sciences - Science and Decisions report and recommendations https://www.nap.edu/catalog/12209/science-and-decisions-advancing-risk-assessment[4] the ACC Olefins Panel sponsored a project by C.R. Kirman and R.L. Grant regarding a quantitative risk assessment on ovarian atrophy, one of the non-cancer effects of 1,3-butadiene in mice, an extremely sensitive species when compared to rat and humans toward 1,3-butadiene 5.

In addition, in response to the EPA's High Production Volume (HPV) Challenge Program, members of the ACC Olefins Panel (previously known as CMA Olefins Panel) submitted important information to the EPA regarding 1,3-butadiene (CAS # 106-99-0). In short, the Olefins Panel submitted reports of categories pertaining to 1,3-butadiene, and in support of these categories presented the EPA with two important repeat exposure studies. These are important studies because they add to our understanding of the effects of 1,3-butadiene on reproductive and developmental endpoints after repeated exposure, as well as using the inhalation exposure route, which represents the most likely exposure route to humans:

a. An Organisation for Economic Co-operation and Development (OECD 422) guideline study (reproductive and developmental toxicity screen) using crude 1,3-butadiene (containing 10% 1,3-butadiene) and,
b. An OECD 421 guideline study (reproductive and developmental toxicity screen) using BD of >99% purity. Other toxicology test results are also described in these HPV submittals.

In conclusion, the Panel appreciates the opportunity to provide comments on the proposed rules and request that Oregon DEQ consider the weight-of-evidence and not reduce the Hazard Index from 5 to 3 for 1,3-butadiene based on critical data including, but not limited to, that which is suggested for consideration by the Committee here.

1 ACC represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a $553 billion enterprise and a key element of the nation's economy. Chemistry companies are among the largest investors in research and development, investing nearly $10 billion in 2018.
2 The Olefins Panel members are: Chevron Phillips Chemical Company LP; The Dow Chemical Company; Eastman Chemical Company; ExxonMobil Chemical Company; INEOS Olefins & Polymers USA; LyondellBasell; NOVA Chemicals Corporation; Shell Chemical LP; and the TPC Group.
3 The TCEQ assessment is available at www.tceq.texas.gov/assets/public/implementation/tox/dsd/final/butadiene,%201,3-.pdf
4 National Research Council. 2009. *Science and Decisions: Advancing Risk Assessment*. Washington, DC: The National Academies Press. https://doi.org/10.17226/12209. Oregon DEQ-2019-0002 November 22, 2019.
Comment categories linked to this comment: 6

Comment Submittal #200 - LETTER
Name: Dr. Neeraja Erraguntla

Affiliation: American Chemistry Council

Comment text:
The American Chemistry Council1 (ACC) Toluene & Xylene Panel (Panel)2 appreciates the opportunity to provide comments on Oregon Department of Environmental Quality's (Oregon DEQ) proposed Cleaner Air Oregon rule changes as they relate to mixed isomers of Xylene (CAS # 1330-20-7). Oregon DEQ is strongly urged to review and consider the weight-of-evidence for including xylenes on the "List of Toxic Air Contaminants Expected to Have Developmental or Other Severe Health Effects."

In 2018, Oregon DEQ's Air Toxics Science Advisory Committee recommended that the Oregon DEQ's Toxicity Reference Value (TRV)4 for xylenes be based on the 2007 Agency for Toxic Substances and Disease Registry's (ATSDR) Chronic Minimal Risk Level (MRL) for mixed xylenes.5 The critical end point reported in the key study relied upon subjective symptoms indicative of reversible neurotoxicity. Inexplicably, Oregon DEQ recommends that the Hazard Index for xylenes be reduced from 5 to 3 based upon developmental and other severe effects which could include respiratory and neurological end points.

The Panel urges Oregon DEQ to review the 2012 California Office of Environmental Health Hazard Assessment (OEHHA)6 assessment published after the ATSDR Toxicological Profile for xylenes. OEHHA reviewed the weight-of-evidence for reproductive and developmental toxicity end points for xylenes as part of the Hazard Identification process when considering xylenes for listing by the Proposition 65 Developmental and Reproductive Toxicity Identification Committee (DARTIC). After completing its review, the DARTIC definitively concluded that "Xylenes" did not meet the Proposition 65 criteria for listing as described in the linked report: https://oehha.ca.gov/media/downloads/proposition-65/chemicals/092812xylenehid.pdf.7

The OEHHA assessment concluded that although a large number of epidemiological and animal studies have been conducted to examine the potential for xylenes to induce either developmental toxicity or male and female reproductive toxicity, many of these studies had significant limitations that affect their usefulness for such assessments. OEHHA's DRAFT Hazard Index Document (HID) identifies a number of study quality and reliability concerns. Consequently, Oregon DEQ should review and consider the OEHHA DARTIC assessment before including xylenes in the "List of Toxic Air Contaminants Expected to Have Developmental or Other Severe Health Effects."

Furthermore, the available epidemiological studies do not provide convincing evidence to support a conclusion of a causal relationship between exposure to xylenes and any endpoint indicative of reproductive toxicity, including, but not limited to, male reproductive toxicity, female reproductive toxicity and developmental toxicity. Moreover, the epidemiological studies on xylenes are further limited for assessing the potential to cause reproductive toxicity because the studies available involve populations with concomitant, mixed exposures and, therefore, confounding exposures to other neutral organic solvents. In summary, the findings from both experimental animal and epidemiological studies clearly do not support identifying xylenes as a reproductive toxicity hazard. In addition, the evidence linking xylenes exposure to neurodevelopmental toxicity is weak.

In conclusion, the Panel welcomes the opportunity to provide comments on the proposed rule and respectfully requests that Oregon DEQ consider the weight-of-evidence on xylenes, including the Panel's previous comments8 to OEHHA, as the basis for maintaining the Hazard Index at 5 rather than imposing a scientifically unwarranted reduction to 3 for xylenes.

1 ACC represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense

advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a $553 billion enterprise and a key element of the nation's economy. Chemistry companies are among the largest investors in research and development, investing nearly $10 billion in 2018.
2 The Panel represents producers of Toluene& Xylene.
3 https://www.oregon.gov/deq/Rulemaking%20Docs/caohim2tac.pdf
4 https://www.oregon.gov/deq/aq/cao/Pages/CAO-Risk-Assessment-Resources.aspx
5 https://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=296&tid=53
6 https://oehha.ca.gov/media/downloads/proposition-65/document/022513synopsisdart.pdf
Comment categories linked to this comment: 6

Comment Submittal #201- LETTER

Name: Dr. Kimberly White
Affiliation: American Chemistry Council

Comment text:

The American Chemistry Council's Formaldehyde Panel (the Panel) has actively engaged in the Cleaner Air Oregon rulemaking process by submitting comments in 2017 and 2018. The Panel's comments focused on providing the best available and most relevant formaldehyde science to serve as the foundation for the toxicity values, benchmark concentrations and risk action levels. We remain disappointed that the Oregon Department of Environmental Quality (DEQ) moved forward with establishing overly conservative toxicity values and benchmark values based on decades-old scientific information when more current information and reviews by international authoritative bodies exist. The DEQ values do not reflect up-to-date formaldehyde science, which clearly demonstrates that safe exposure thresholds exist and that there is limited human health risk from current environmental exposure levels.

Currently, DEQ is proposing a rulemaking which seeks to lower the hazard index (HI) value for formaldehyde and 155 other chemicals from 5 to 3. DEQ's proposal to lower the HI value is based on the assumption that if a chemical is expected to cause developmental or other severe human health effects, DEQ can reduce the HI. However, DEQ: (1) does not provide the weight of scientific evidence that supports an association of formaldehyde with developmental or reproductive effects; and (2) does not take into consideration that the benchmark values and risk action levels are already based on conservative assumptions and lowering the HI compounds the applied conservatism. Notably, DEQ has not provided the references or justification in the proposed rule documentation to demonstrate adequate support for lowering the formaldehyde HI.

Formaldehyde is one of the most-studied chemicals, with a wealth of information available in the published and grey literature. It has been well established that formaldehyde found in the ambient air does not pass beyond the respiratory epithelium and, therefore, any direct effects associated with formaldehyde exposure are limited to the portal-of-entry (i.e., the nose or upper airways).1,2,3,4,5 Multiple studies have also been published on the potential for reproductive and developmental effects of formaldehyde in humans and animals. For example, a 2001 publication by Collins et al.6 examined the potential for reproductive and developmental effects from formaldehyde exposure. The authors noted that formaldehyde is unlikely to reach the reproductive system in humans in concentrations sufficient to cause damage and that experimental studies and studies of metabolism indicate reproductive impacts are unlikely at formaldehyde exposure levels observed in the epidemiology studies. Most recently, in 2019, the European Chemicals Agency conducted an evaluation of the available literature7 and found that there is no convincing evidence that formaldehyde would lead to reproductive or developmental effects in humans or experimental animals at concentrations in the air that do not lead to irritation in the respiratory tract. Formaldehyde is also not classified as causing reproductive toxicity in the European Union.

In addition to the weight of the scientific evidence not supporting an association with developmental or reproductive effects, DEQ's formaldehyde toxicity reference values for chronic and acute non-cancer effects are based on California Office of Environmental Health Hazard Assessment (OEHHA) and Agency for Toxic Substances and Disease Registry (ATSDR) values. Both OEHHA and ATSDR ignored the scientific evidence which supported a threshold for adverse effects associated with formaldehyde exposures when they established their values and, because of the age of the reviews, do not take into consideration more recent science. Even though these values don't reflect the latest science, they both specifically identify the respiratory system as the main endpoint of interest. For example, OEHHA notes the respiratory system as the hazard index target organ of interest in the derivation of its toxicity values. Similarly, the ATSDR value establishes a chronic inhalation minimal risk level based on respiratory effects in humans. This ATSDR value is an estimate of the daily human exposure that is likely to be without appreciable risk of adverse non-cancer health effects.

Given that both overly conservative values generated by OEHHA and ATSDR focused on the respiratory system and not developmental or reproductive impacts, it seems reasonable to assume the respiratory system is the most relevant health endpoint for which to establish risk-related action levels. Based on this information and the scientific evidence, the Panel requests that DEQ: (1) set an HI of 5 for formaldehyde as supported by the scientific evidence and (2) update the DEQ HI documentation to provide the specific scientific support, for each individual substance, that justifies the lowering of any HI from 5 to 3.

1 Leng, J., Liu, C.W., Hartwell, H.J., Yu, R., Lai, Y., Bodnar, W.M., Lu, K. and Swenberg, J.A. (2019). Evaluation of inhaled low-dose formaldehyde-induced DNA adducts and DNA–protein cross-links by liquid chromatography–tandem mass spectrometry. Archives of Toxicology, 93(3), 763-773.
2 Lai, Y., Yu, R., Hartwell, H. J., Moeller, B. C., Bodnar, W. M., & Swenberg, J. A. (2016). Measurement of Endogenous versus Exogenous Formaldehyde–Induced DNA–Protein Crosslinks in Animal Tissues by Stable Isotope Labeling and Ultrasensitive Mass Spectrometry. Cancer Research, 76(9), 2652-2661.
3 Yu, R., Lai, Y., Hartwell, H. J., Moeller, B. C., Doyle-Eisele, M., Kracko, D., Bodnar, W., Starr, T., & Swenberg, J. A. (2015). Formation, accumulation, and hydrolysis of endogenous and exogenous formaldehyde-induced DNA damage. Toxicological Sciences, 146(1), 170-182.
4 Edrissi, B., Taghizadeh, K., Moeller, B., Kracko, D., Doyle-Eisele, M., Swenberg, J., and Dedon, P. (2013). Dosimetry of N 6-Formyllysine Adducts Following [13C2H2]-Formaldehyde Exposures in Rats. Chemical Research in Toxicology, 26(10), 1421-1423.
5 Moeller, B., Lu, K., Doyle-Eisele, M., McDonald, J., Gigliotti, A., and Swenberg, J. (2011). Determination of N 2-hydroxymethyl-dG adducts in the nasal epithelium and bone marrow of nonhuman primates following 13CD2-formaldehyde inhalation exposure. Chemical Research in Toxicology, 24(2), 162-164.
6 Collins, J. J., Ness, R., Tyl, R. W., Krivanek, N., Esmen, N. A., & Hall, T. A. (2001). A review of adverse pregnancy outcomes and formaldehyde exposure in human and animal studies. Regulatory Toxicology and Pharmacology, 34(1), 17-34.
7 European Chemicals Agency (ECHA) ANNEX XV Restriction Report. Proposal for A Restriction. Formaldehyde and formaldehyde releasers. March 2019. https://echa.europa.eu/documents/10162/ee418b46-92cc-8db2-de97-5c7599df763c
Comment categories linked to this comment: 6, 7

Comment Submittal #202 - LETTER
Name: Sahar Osman-Sypher
Affiliation: American Chemistry Council

Comment text:
The American Chemistry Council Diisocyanates Panel1 (Panel) appreciates the opportunity to comment on the Oregon Department of Environmental Quality (DEQ) above referenced Hazard Index rulemaking. DEQ is proposing to establish more conservative health standards for air contaminants that the State contends are expected to cause developmental or other severe human health impacts. This action would

lower Risk Action Level benchmarks for 156 air contaminants from a Hazard Index of 5 to 3. The Panel believes DEQ's proposal to lower the Hazard Index for toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) on the basis that these chemicals are expected to cause development effects is fundamentally flawed and not grounded in science. As such, the Panel urges DEQ to remove TDI and MDI from its list of chemicals purported to be developmental toxicants.

1 The Diisocyanates Panel represents the U.S. companies that manufacture or import methylene diphenyl diisocyanate (MDI) and/or toluene diisocyanate (TDI). The Panel is comprised of BASF Corporation, Covestro LLC, Dow, Huntsman Corporation and Wanhua Chemical (America) Co., Ltd.

Summary

It has been demonstrated in developmental toxicity studies in rodents that maternal exposure to diisocyanates can result in minor developmental effects in offspring (Tyl et al., 1999, Buschmann et al., 1996, Gamer et al., 2000). However, it is well established that maternal conditions can induce fetal developmental effects indicating that the developmental toxicity can be secondary to maternal toxicity (Tyl 2012; Nitzsche 2017). While maternal toxicity does not automatically negate a fetal effect, when combined with mechanistic information, it can demonstrate a lack of human relevance. Results from both MDI and TDI studies demonstrate that the fetal toxicity is limited to effects commonly associated with maternal toxicity. Further, developmental effects of isocyanates have been linked to a rodent-specific mechanism associated with respiratory irritation. Taken together, diisocyanate-induced fetal effects in rodents are secondary to maternal toxicity and they should not be considered developmental toxicants for humans.

While it has been established that maternal toxicity to diisocyanates can result in developmental effects in rodent offspring, the effects noted in these studies are not relevant to human exposure and should be considered secondary. Maternal conditions that cause decreased uterine-placental blood flow, decreased nutrient circulation, anemia, altered acid-base balance, hypoxia, obesity and other effects have been shown to contribute to fetal developmental toxicity. Some common developmental effects resulting from these maternal conditions include supernumerary ribs, delayed fetal growth, and skeletal variations, such as delayed ossification (Tyl 2012; Nitzsche 2017). Results from both MDI and TDI studies demonstrate that fetal toxicity was limited to minor skeletal variations and fetal growth and is only observed at concentrations that also induce significant reductions in maternal food consumption and body weight gain, and respiratory toxicity (e.g., laboured breathing, increased lung weights) in the dams. Thus, these minor developmental effects should be considered secondary.

Discussion

TDI

In a developmental inhalation toxicity study similar to OECD Guideline 414, TDI was administered to 25 female Sprague-Dawley rats/dose by whole body exposure at dose levels of 0, 0.02, 0.1, and 0.5 ppm for 6 hours per day from days 6 through 15 of gestation (Tyl, et al., 1999). Maternal toxicity was observed in the 0.5 ppm group as evidenced by a significant reduction in body weight, a significant reduction in body weight gain, significantly reduced food consumption, and audible and rapid respiration. The dams in the TDI exposure study exhibited a 15% reduction in food consumption and a 46% decrease in body weight gain in the 0.5 ppm exposure group compared to controls during the exposure period (Gestational day 6 to 16). The dams showed no evidence of systemic toxicity and no treatment related gross pathological findings.

There were no significant differences observed in the incidence of any individual malformation or total malformations between treated and control pups. The only incidence of a statistically significant variations was delayed ossification of the cervical centrum 5, which occurred only at the highest (0.5

ppm) exposure level. It appears unlikely that this variation is indicative of possible minimal fetotoxicity because it occurred in the absence of any other indications of developmental toxicity. Effects observed on the cervical centrum are a common rat fetal skeletal variation (Woo and Hoar 1979; Banerjee and Durloo, 1973). In addition, delayed ossification is a common fetal manifestation induced by maternal toxicity (Tyl 2012; Nitzsche 2017).

MDI

An inhalation OECD 414 study was conducted using monomeric MDI at concentrations of 1, 3, and 9 mg/m3 (Buschmann et al. (1996) for 6 hrs/day from gestation days 6 to 15. Maternal toxicity was noted by a reduction in food consumption and an increase in lung weights in the high-dose group. Treatment did not influence any other maternal and/or foetal parameters investigated, with the exception of a slight but significant increase in litters with fetuses displaying asymmetric sternebra(e) (within the limits of biological variability) that was observed after treatment with the highest dose of 9 mg/m3.

An additional key study performed on polymeric MDI (which contains about 50% monomeric MDI) was conducted according to OECD Guideline 414 at concentrations of 0, 1, 4 and 12 mg/m3 (Gamer et al., 2000). Maternal toxicity was observed by mortality, damage to the respiratory tract, reduced body weight development and reduced mean gravid uterus weights at 12 mg/m3. At this concentration clear signs of developmental (embryo-/foeto-) toxicity in the form of reduced placental and foetal body weights and an increased occurrence of foetal skeletal (and overall) variations and retardation were recorded; however, no substance-induced teratogenic effects were observed up to and including the highest concentration (12 mg/m^3).

It is commonly accepted that maternal conditions that cause decreased uterine-placental blood flow, decreased nutrient circulation, anemia, altered acid-base balance, hypoxia, obesity and others have been shown to contribute to fetal developmental toxicity. Some common developmental effects resulting from these maternal conditions include supernumerary ribs, delayed fetal growth, and skeletal variations, such as delayed ossification. For both MDI and TDI, the only developmental effects noted are minor skeletal variations and slightly inhibited fetal growth and are only observed at concentrations that also induce significant reductions in maternal food consumption and body weight gain, and respiratory toxicity (e.g., laboured breathing, increased lung weights). Reduced fetal weight and delayed ossification are common fetal manifestations induced by maternal toxicity (Tyl 2012; Nitzsche 2017) which suggests that the fetal effects noted in the MDI and TDI studies are secondary.

While maternal toxicity should not automatically negate a fetal effect, there is also sufficient mechanistic data to support a finding that there is a lack of human relevance for TDI and MDI fetotoxicity. OECD "Guidance Document on Inhalation Toxicity Studies" (no. 39) describes the rodent-specific physiological effects of respiratory irritants on inhalation developmental toxicity studies (OECD, 2018). In short, rodents have a respiratory reflex that reduces respiration and body temperature and subsequently results in fetal hypoxia, hypercapnia, hypothermia and malnutrition. As the fetus is more sensitive to hypothermia and hypoxia, developmental defects and delays can be experienced. Isocyanates are known respiratory irritants and are included as an example of substances that induce the rodent-specific irritation reflex known to cause developmental effects. Thus, effects noted in these studies are not representative of being relevant to human exposure and MDI and TDI should not be considered developmental toxicants and classified as such.

Conclusion

Although developmental toxicity studies with MDI and TDI result in minor developmental toxicity for rodents, these effects are only noted at maternally toxic concentrations and through a mechanism that is not relevant to humans. We urge DEQ to critically examine the studies relied upon to ascertain their relevance (or lack thereof) to human exposure before making an assertion that is not scientifically

justified. In addition, the default Hazard Index should be adjusted based on the best available science taking into consideration the weight-of-evidence and the magnitude of the identified effect. It is also important to recognize that the studies DEQ references are in many cases decades old, and have not been used by any national (e.g., ATSDR, USEPA, CA OEHHA) or international (e.g., EU CLP Regulation) authoritative body to conclude that TDI and MDI pose a significant human hazard for developmental toxicity. Further, neither MDI nor TDI Oregon DEQ Hazard Index on the cervical centrum are a common rat fetal skeletal variation (Woo and Hoar 1979; Banerjee and Durloo, 1973). In addition, delayed ossification is a common fetal manifestation induced by maternal toxicity (Tyl 2012; Nitzsche 2017). are regulated as reproductive toxicants according to California EPA Prop 65. Therefore, MDI and TDI should not be considered developmental toxicants according to Oregon's DEQ's Hazard Index rulemaking.

In conclusion, a more informed review of the data supports the conclusion that TDI and MDI do not pose a significant human hazard for developmental toxicity. DEQ's proposal lacks a reliable scientific basis and therefore the Panel requests the withdrawal of TDI and MDI from the list of chemicals purported to have developmental effects.

References

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