Guidance Document

First and Second Tier Review of Toxic Air Pollution Sources Health Impact Analysis (Chapter 173-460 WAC)

Health Impact Analysis (Chapter 173-460 WAC)

Emission Unit and Activity Exemptions for New Source Review (WAC 173-400-110 and WAC 173-400-110(4))

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First and Second Tier Review

Introduction

The Department of Ecology (Ecology) and local air quality agencies use first and second tier review to regulate emissions of toxic air pollutants. Hundreds of potentially toxic chemicals are released into the air each year in Washington. Excess exposures to these chemicals can cause serious illnesses and premature deaths. Widespread exposure probably accounts for some of the occurrences of various types of cancers within our population.

This publication is to help toxic air pollution sources understand and use the first and second tier review sections of the notice of construction application. Requirements for first and second tier review are in Chapter 173-460 Washington Administrative Code (WAC).

Guidance

First Tier

What is first tier review?

First tier review is part of a notice of construction application for a new or modified toxic air pollutant source. Basically, it compares your project emissions to the toxic air pollutant values listed in WAC 173-460-150.

How do I know if I need to do a first tier review?

You'll need to do a first tier review if your project emissions exceed the de minimis emission levels specified in WAC 173-460-150.

What issues must I address before the order can be issued?

You must show that the emission increases from all new or modified emission units are below the acceptable source impact level (ASIL):

- after application of best available control technology for air toxics (tBACT); and
- at any point on the ambient air outside of your property, perhaps in a neighboring building or on the adjacent street.

You can find the ASILs in WAC 173-460-150.

How can I show that emissions are below the ASIL?

You can show emissions are below the ASIL by:

- demonstrating that the emissions are at or below the small quantity emission rates (SQER);
- using a screen model; or
- using a refined air dispersion model.

What can I do if emissions exceed the ASIL?

You have several options, including:

- revise the project and application;
- negotiate an enforceable limit;
- off-set the emissions by reducing emissions from another on-site emission unit;
- submit a second tier petition; or
- withdraw the application

How do I off-set the new emissions by reducing them at another emission unit?

This is a new concept introduced in the 2008 rule revisions. You must meet several criteria in order to get this option approved:

- the emission reductions must be actual reductions based on the previous 24 months' emissions;
- the reductions must be modeled against all impacted/affected receptors; and
- the modeling must demonstrate that the off-set proposal results in emission values lower than the ASIL when the emission increases and reductions are modeled together at the receptor.

Who approves a first tier analysis?

Your permitting agency will review the first tier analysis and either approve or deny it.

What happens if my first tier analysis is approved?

If your permitting agency approves the first tier review, they will include the approval decision in an "Order of Approval." Guidelines for issuing this order and requirements for notifying the public are in WAC 173-400-110. The order must contain *at least* the following:

- emission limits for each toxic air pollutant (TAP);
- a method of assuring compliance with TAP limits (usually monitoring, reporting, and operation restrictions;
- a statement of the Best Available Control Technology for Air Toxics (tBACT) for each TAP; and
- enforcement criteria for voluntary emission reductions, including monitoring, record-keeping, and reporting requirements.

What happens if my first tier analysis is not approved?

If emission increases still exceed the ASIL and other options don't work, you can submit a petition for second tier review.

Second Tier

What is second tier review?

Like first tier review, second tier review is part of a notice of construction application for a new or modified toxic air pollutant source. You need to do a second tier analysis if any of your project's toxic air pollutant emissions exceed the ASIL after you've completed a first tier review.

Who approves a petition for second tier review?

Only Ecology staff can review, approve, or deny a second tier petition. Ecology recommends you have a pre-application conference with Ecology staff before you submit a second tier petition.

Why have a pre-application conference?

The conference:

- helps you identify regulatory issues before you commit a significant amount of time and resources toward a specific course of action;
- lets you know early in the process what you need to address in the Health Impact Analysis, which helps you avoid unnecessary delays later on; and
- helps you identify the review criteria for your project, so that you can present your proposal accurately.

Who attends a pre-application conference?

You and your consultant team need to attend the conference. The team typically includes an engineer, plant operations manager, and other specialists involved in your proposal. You and your team will meet with an Air Quality Program engineer, and possibly a toxicologist and an air quality modeler. The permit writer who reviewed your first tier analysis will also attend, whether they work for Ecology or a local air quality agency.

What will happen at the conference?

You, your team, and Ecology staff will review the following information:

- required permits, approvals, and fees;
- protocol for the health impact analysis;
- the refined air dispersion modeling methods used to estimate TAP levels;
- typical project review timelines;
- application regulations;
- the public hearing process; and
- any other questions you might have.

Will I get all the information I need at the conference?

The amount of information Ecology can give you at the conference depends on the level of detail you provide about the project. Because the conference takes place

early in the process, Ecology will not be able to anticipate all the relevant project details. Ecology will give you a protocol to follow that tells you what to do next.

The conference will not provide:

- a detailed toxicology analysis or modeling review; or
- a final recommendation on a proposal.

Where is the conference held?

Pre-application conferences are typically held at Ecology's Headquarters building at:

300 Desmond Drive SE
Lacey, WA 98503

How can I schedule a conference?

Call Richard Hibbard at 360-407-6896. He will work with you to find a time that works for everyone.

What materials should I provide, and when?

Required documentation for the second tier analysis varies, depending on the proposal. Follow the protocol you were given at the pre-application conference.

Provide to Ecology:

- the results of the refined air dispersion modeling for all pollutants that exceed the ASILs; and
- a full copy of the second tier petition;
- the permitting authority (the permitting authority is either a local air quality agency or one of Ecology's regional offices) will provide a preliminary order of approval directly to Ecology.

Provide to the permitting authority that reviewed your first tier application:

- a full copy of the second tier petition.

What is the review process for a second tier petition?

Ecology's air toxics engineer, toxicologist and air quality modeler work together on second tier petitions.

Within 30 days after you've submitted the petition, Ecology will:

- review it for completeness; and
- provide you a letter stating the petition is complete or listing needed information if it is not complete.

Within 60 days after you've submitted a complete application, Ecology will:

- write a draft technical support document and send it to you and the permitting authority for review and comment;

- address any questions or concerns brought up during review;
- make a final recommendation for approval or denial of the petition; and
- send the recommendation to you and the permitting authority, which issues the actual approval order.

Ecology's recommendation on the Second Tier petition must be included in the final decision.

Is public involvement required?

Yes. Public involvement is required for any project that needs a second tier review. The public involvement could be limited to a notice and comment period. It is also possible that Ecology will determine that a hearing is justified. If a public hearing is held, Ecology and the permitting authority will hold a joint hearing to streamline the public review process. Ecology staff will explain the second tier recommendation at the hearing. You and your consultants should be prepared to explain your project and answer questions at the hearing.

What can I do if Ecology does not approve the second tier review?

You have the following options:

- revise the project and application;
- propose emission reductions from an off-site emission unit;
- submit a third tier petition; or
- withdraw the application.

Are there any exemptions from the first and second tier review process?

Yes. You can find exemptions from new source review in WAC 173-400-110. Exemptions for toxic air pollutants and criteria pollutants are linked because the permit process procedures, definitions, and exemptions are the same for both.

Exemptions are divided into two broad categories:

- emission unit and activity exemptions; and
- exemptions based on emissions.

To see if your project is exempt, read the emission unit and activity listing in WAC 173-400-110(4 and 5). De minimis emission values for toxic air pollutants are in WAC 173-460-150. You must consider all of the new or modified emission units together. Emissions from all of the individual emission units added together must be below the de minimis values for the project to be exempt.

What if some of my project's emission units are exempt, but others are not?

If your project consists of several emission units and some are exempt, but others are not, you must submit an application and get approval before beginning construction.

Here are several examples of projects, with a short discussion of their qualifications for an exemption.

Example 1

A project consists of four emissions units. Each one individually would be below the de minimis levels in WAC-173-400-110(5) but together they would exceed the level. Is the project exempt from new source review?

No. It is the project (emissions from all individual emission units) that must be below the de minimis level to be exempt from new source review.

Example 2

A project is de minimis for criteria pollutants but not de minimis for toxic air pollutants. Does the project need new source review?

Yes. In order for a project to be exempt, it must be below the de minimis level for all pollutants. New source review is pollutant specific. It is required for all toxic air pollutants whose emissions exceed the de minimis thresholds.

Example 3

A source proposes to install an emission unit or activity that is listed in WAC 173-400-110(4), but its emissions exceed the de minimis levels listed in WAC 173-400-110(5). Does the project need new source review?

No. In this situation, the project is exempt because the emission unit or activity exemption takes precedence over the emission values in WAC173-400-110(5). As the project is exempt, there is no reason to quantify the emissions.

Example 4

A source is installing an emergency generator of less than 500 brake horse power (BHP), one combustion unit with a heat input of less than 1,000,000 Btu/hr using fuel oil, and a single laboratory fume hood. Is the project subject to new source review?

No. This project is composed of three emission units that meet the unit and activity exemption criteria. If the proposal included two or more fume hoods, two or more emergency generators (even when of total less than 500 BHP), or multiple combustion units that exceeded the thresholds of WAC 173-400-110(4)(c), the project would need new source review.

Example 5

A source wants to modify a project with aggregate heat inputs 4,000,000 Btu/hour fueled by natural gas. Before any modifications, it is exempt in

compliance with WAC173-400-110(4). Will it still be exempt after the modifications are made?

It depends. If the modifications allow more than 4,000,000 Btu/hour, then the numerical de minimis levels in WAC-173-400-110(5) should be consulted. If the emission levels are below the exemption levels then it is still exempt. However, if any of the emission levels rise above the TAP de minimis levels, then additional review is required.

Where can I get more information about first and second tier review?

For information about your first tier permit, call the permitting authority - either your local air quality agency or the Ecology regional office for your area. Names and contact information are on the Air Quality Program web site at www.ecy.wa.gov/programs/air/airhome.html .

For information about your second tier petition, contact Richard Hibbard of Ecology's Air Quality Program at (360) 407-6896 or rhib461@ecy.wa.gov.

Links to current permit activity, rule writing and Ecology publications are on the Air Quality Program web site at www.ecy.wa.gov/programs/air/airhome.html. Contact information for Ecology regional offices and headquarters, publications, and links to local air quality agencies are also located here.

This document is intended to provide guidance in applying for a First or Second Tier notice of construction permit and is for informational use only. It cannot be used as a substitute for Washington Administrative Code Chapter 173-460 WAC, Controls for New Sources of Toxic Air Pollutants. It does provide supplemental information for the regulation. More information is available from Ecology's Air Quality Program or on Ecology's website at www.ecy.wa.gov/programs/air/airhome.html.

Health Impact Analysis

Introduction

This section helps toxic air pollution sources prepare a health impact analysis as part of second tier or third tier review, as required in Chapter 173-460 Washington Administrative Code (WAC).

Ecology's Air Quality Program recommends that permit applicants preparing a Health Impact Assessment refer to the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, published in 2003 by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency. (The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. Oakland, CA. August 2003). You can download a copy of this document at www.oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf

The guidance manual addresses the techniques used in health risk assessment of airborne contaminants released by new or modified stationary sources like those permitted in Washington's WAC 173-460. Most of the techniques described in the Hot Spots Program Guidance Manual are common to other regulatory risk assessment applications. However, applicants may need additional analyses depending on circumstances unique to their situation. Therefore, applicants should contact Ecology before beginning work on their HIA in order to assure that all WAC 173-460-090 requirements will be satisfied. In general, the use of the Hot Spots Program Guidance Manual risk assessment procedures and report presentation will expedite Ecology's review and will minimize the chance that applicants will need to revise and resubmit their HIA.

Guidance

What is a health impact analysis (HIA)?

A health impact analysis looks at how emissions of toxic air pollutants from a specific project will affect public health. It addresses many areas, including hazard identification, exposure pathways, toxicity, and risk assessment.

Who needs to submit a HIA?

Second and third tier petitions always need a HIA. Petitions for a second or third tier review must be submitted to ecology with a copy to the permitting authority with jurisdiction. The HIA will be part of the agenda at the pre-application conference that Ecology's air toxics engineer sets up for you.

Why do I need a pre-application conference?

Pre-application conferences help you learn about regulatory issues before you commit a significant amount of time and resources to a specific course of action. At the pre-application conference, Ecology will tell you what issues need to be addressed in the HIA. This will help you avoid unnecessary costs and delays.

What documentation do I submit with a HIA?

Because each HIA is tailored to fit a specific project, each one may require different documentation. Generally, you will need to include:

- A map of the site and neighborhood showing:
  - location of new or modified emission points;
  - local zoning of the affected area;
  - locations of and distances (in meters) between the source; and
  - residences, businesses, roadways, pubic properties and public or private facilities serving population subgroups such as schools, nursing homes, and hospitals, private and public drinking water wells (note the well depth).
- Hazard identification, including:
  - a list of all toxic air pollutants (TAPs) (as defined in Chapter 173-460 WAC) that will be emitted by the facility, and
  - a physical description of those TAPs.

What do I need to submit about the TAP concentrations?

You must show derivation of the concentration levels. Include the following:

- emission rates, in grams per unit of time, at the maximum possible rate;
- modeled concentration estimates in µg/m3 or ppb (disclose the emissions factors used in modeling);
- any available monitoring measurement results; and
- any uncertainties and assumptions in deriving concentration levels.

You must also disclose the cross-media transport of the emissions in the environment, the environmental persistence, the degradation pathways, and the final fate of the toxic air pollutants. This means describe the movement of proposed toxic air emissions from air into water and or soil to which people may be exposed. Generally, the inhalation pathway of exposure is the largest contributor to the total dose. However, there are situations where a non-inhalation pathway contributes substantially to total dose. You can get detailed guidance on this subject from a variety of authorities, for example EPA's Guidelines for Exposure Assessment (1992) and Exposure Factors Handbook (1997) and Chapter five of OEHHA's Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (2003).

What materials do I need to include to assess exposure?

You must identify the TAP exposure pathways, including the following:

- Disclose the total daily intake of TAPs attributable to the project source as well as the background sources. US EPA has some ambient air concentration estimates in their NATA database.
- Estimate the durations of exposure, including long-term averages, short-term peaks and worst-case scenarios. Detail the exposure parameters associated with sensitive population subgroups. You can get detailed guidance on this subject from a variety of authorities, including EPA's Guidelines for Exposure Assessment (1992) and Exposure Factors Handbook (1997) and Chapter four of OEHHA's Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (2003). Identify the potentially exposed populations. Give special emphasis to any subpopulations that might be unusually susceptible to any TAPs emitted by your project.
- Using the information on the location of potentially exposed populations, show the TAP concentrations at the points where people might be exposed to the pollutants in question.

What issues do I need to address in the toxicity discussion?

The toxicity discussion should focus on the effects relevant to the proposed toxic air pollutant concentrations. The following issues should be thoroughly discussed:

- toxic effects of the toxic air pollutants;
- exposure levels associated with specific effects;
- exposure patterns and duration of exposure as established by studies of the toxic effects;
- any quantitative, chronic toxicity values including:
    - inhalation reference concentration or similar hazard-based concentrations;
    - cancer unit risk factor estimates;
    - slope factor or carcinogenic potency estimates; and
- any quantitative intermediate and short-term acute toxicity values.

In addition to submitting the toxicity information, you should cite any epidemiological studies that your conclusions are based on. If toxico-kinetic models are used, they must have been peer reviewed and validated using empirical data.

Are there guidelines for site specific toxicity values?

Yes. If you develop site-specific quantitative toxicity values, include the following information:

- complete copies (including a bibliography) of any references used to derive such toxicity values;

- names and contact information of the experts who are familiar with the research that supports the site-specific toxicity values;
- a discussion of how the site specific toxicity value considers exposure duration and frequency at the site; and
- a discussion of the adequacy of the site specific toxicity values. Disclose any uncertainties regarding public protection.

What issues do I need to address in the risk/hazard assessment section?

Provide a discussion of offsetting reductions in risk that might accrue to society as a result of completing the proposed facility modification. This typically includes:

- a qualitative discussion of the risks;
- a quantitative discussion of the risks with appropriate toxicity measures, calculated cancer risks, and the hazard quotient index;
- a discussion of uncertainties in the risk assessment;
- a discussion of acceptability of risk with regard to guidelines in Chapter 173-460 WAC; and
- a discussion of the extent to which the proposal might affect human health.

What issues do I need to address in the uncertainty section?

There is always some level of uncertainty associated with risk assessment. While uncertainty encompasses those factors that are not known and could be eliminated or reduced with scientific studies, we are not asking you to conduct original research. We want you to disclose your level of confidence in the data used to substantiate your conclusions.

Risk can be over or underestimated because of many factors, including:

- extrapolation of toxicity data in animals to humans,
- uncertainty in the estimation of emissions,
- uncertainty in the air dispersion models,
- interactive effects of exposure to more than one carcinogen or toxicant and
- uncertainty in the exposure estimates.

Are there differences in the human population that could affect the HIA?

Even if all of these uncertainty factors were eliminated, there is still a natural range or variability in the human population in such properties as height, weight, and susceptibility to chemical toxicants.

Variations within human populations that may influence toxicant response include factors such as:

- metabolism,
- target site sensitivity,
- lifestyle and diet,
- immunological responses, and
- genetics.

The HIA mentions subpopulations. What is an example of a sensitive or understudied subpopulation?

Children are a subpopulation whose hematological nervous, endocrine, and immune systems are still developing. They may be more sensitive to the effects of carcinogens on their developing systems. These sensitivities are not included in the worker population and risk estimates based on occupational epidemiological data which are based on adult populations.

Who reviews the HIA?

Ecology's Air Quality Program toxicologists review HIAs. While the toxicologists are reviewing the HIA, the engineer and meteorological/modeling staff review other portions of the second tier petition. They determine if Best Available Control Technology for air toxics (tBACT) and refined modeling are sufficient.

Note that while Ecology's toxicologists review HIA documentation, they are not authorized to prepare the applicant's assessment.

What can I do if Ecology does not approve the health impact analysis?

You have the following options:

- revise the project and application;
- propose emission reductions from an off-site emission unit;
- submit a third tier petition (See WAC 173-460-100); or
- withdraw the application.

Where can I get more information on the HIA?

Contact either of the Air Quality Program toxicologists:

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(360) 407-6817
mkad461@ecy.wa.gov

Gary Palcisko
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gpal461@ecy.wa.gov

Citations

Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, Oakland, CA, 2003. (http://oehha.ca.gov/air/hot_spots/finalStoc.html)

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Emission Unit and Activity Exemptions for New Source Review

Introduction

New or modified sources of air pollution must go through New Source Review and submit a notice of construction application to get a permit. The 2008 revisions to Chapter 173-400 Administrative Code (WAC) exempt certain emission units and activities from this requirement. This section explains the new exemption for educational and research laboratory fume hoods for sources of toxic air pollution.

Guidance

What is this new exemption from New Source Review?

A notice of construction application is not required for lab research, experimentation, analysis, and testing at research and education facilities.

The purpose of this exemption is to allow laboratories that operate in a research mode to perform experiments without triggering analysis and permitting for each experiment. An example of a source that would fall into this category is a university. It would be burdensome to require universities to get a permit for each experiment or class curriculum. The permitting delays and additional costs would adversely impact the college program.

How do I know if my research or educational project is exempt?

To be exempt, a source must not engage in the production of products, or in providing commercial services, for sale or exchange for commercial profit except in a de minimis manner. "De minimis" allows for some profit to be made by these laboratories. Each permitting authority must determine if the commercial services at a lab are exempt.

Examples of exempt services are laboratory research, experimentation, analysis and testing at sources whose primary purpose and activity is research or education. However, pilot-plants or pilot scale processes at these sources are not exempt.

How can I get more information about emission unit and activity exemptions?

The complete list of exemptions from New Source Review is in WAC 173-400-110 (4) and (5). You can also contact Richard Hibbard of Ecology's Air Quality Program at (360) 407-6896 or rhib461@ecy.wa.gov .