AB 2588 Hot Spots Frequently Asked Questions

Purpose of this Document

This document is for informational purposes only. It is not intended to add to, or subtract from, the laws or regulations and it is not a substitute for actual laws or regulations. This document is intended to aid Air Districts, community members, stakeholders and the general public in understanding the *AB 2588 Hot Spots Program* reporting guidelines. This document will be updated on a semi-annual basis as more FAQs are brought to CARB's attention during the implementation phase of the most recent amendments to the AB 2588 Hot Spots Emission Inventory and Criteria Guidelines Regulation (EICG).

Background

On November 19, 2020, the California Air Resources Board (CARB/Board) adopted amendments to the AB 2588 Air ToxicsHot Spots Emission Inventory Criteria and Guidelines Regulation (EICG) (Guidelines, Section 93300.5, Title 17, California Code of Regulations) to ensure continued protection of public health by collecting more comprehensive emission data, provide CARB and the local air districts with a better understanding of stationary source emissions, enhance the public access to information on toxic pollutant emissions, and require the reduction of localized health risks at facilities that may present significant impacts. The 2022 amendments are also designed to support community-focused efforts at CARB to reduce criteria pollutant and air toxic emissions from California's most overburdened communities. These amendments are available on the CARB website *here*.

As a reminder, an interested party may submit a petition to the Executive Officer of the state board to request the addition of one or more substances to Appendix A via *ab2588ei@arb.ca.gov*. This email can also be used to reach out to the Toxics Inventory and Special Projects Section at CARB for questions about the Hot Spots Program.

You may also reach out to the Supervisor of the Toxics Inventory and Special Project's section at CARB, Melissa Venecek at *melissa.venecek@arb.ca.gov.*

FAQ by Category:

General

Who is subject to the AB 2588 Hot Spots Program?

Any business or facility in California that emits greater than 10 tons per year of organic gasses, PM, NOx, or SOx, or smaller facilities included in Appendix E of the EICG Regulation such as gas stations, dry cleaners, and chrome platers, are subject to Hot Spots.

Who enforces the Hot Spots Law?

The local air district enforces all Hot Spots requirements. If you have specific questions about a facility, please contact your local *air district*.

How are changes to Hot Spots made?

The State legislature passed legislation in 1987 (AB 2588, Connelly) that requires CARB to adopt a regulation to specify certain criteria to implement the AB 2588 Hot Spots Law. The Emission Inventory Criteria and Guidelines Regulation (Guidelines, or EICG Regulation) has been updated a few times over the past 20 years and implements the intent of the Legislature. EICG describes which types of facilities are subject to the Program, which pollutants are reported, and how those emissions are to be reported.

What changes were approved by the Board in November 2020?

The 2020 amendments revised the EICG Regulation (Title 17, California Code of Regulations, Section 93300.5) to incorporate by reference the 2020 amended Emission Inventory Criteria and Guidelines Report (2020 EICG Report). The amendments included in the 2020 EICG Report include revisions to the main sections (Sections I through XI), as well as the Appendices (Appendix A through Appendix G). Changes were made to the diesel engine reporting requirements including an update to require reporting of emissions from stationary portable diesel engines greater than 50 horsepower at specified larger facilities and enhance the language to clarify District discretion for other diesel engines. The Appendix A list of reportable substances was updated to include many new or modified chemicals of concern. Appendix E was updated to include additional classes or sectors, and reporting thresholds for facility types posing potential public health concerns. Additionally, the Appendix E categories and thresholds were revised to more health protective levels.

When did these new requirements become applicable?

The amended EICG Guidelines are in effect as of March 21, 2022.

How is emission inventory reporting different from an air district annual report?

There are **two** different types of reporting requirements defined in the California Health and Safety Code (HSC), both of which involve the Air Districts in their central role in implementing AB 2588:

Emission Inventory Reporting
As defined in the HSC §44340, a facility operator is required to prepare and submit an "emission inventory" report of their annual air toxic emissions released from their facility. These emission inventories are then reviewed and approved by the Air District. Following this review, the Air District submits the emissions data for each facility to CARB's statewide emission inventory data system (CEIDARS). Pursuant to HSC §44342, CARB establishes *Emission Inventory Criteria & Guidelines (EICG)* for facility operators and air districts to follow in preparation of the emission inventory report. HSC §44345 requires CARB to compile and make available "all data" reported by all facilities subject to the program.

Reporting of emissions applies to all facilities in the program, not just "high priority" or "high risk" facilities. In addition, the AB 2588 statute has broad applicability for all "routine" and "predictable" releases (including fugitive releases) and a broad definition for "facility". It is important to note that AB 2588 requirements apply to a facility whether or not that facility is subject to Air District permitting requirements. (see HSC §§ 44340, 44342,44345).

Facilities exempt from the reporting requirements must either have a prioritization score of 1.0 or less, for both cancer and non-cancer; and/or risk assessment values less than 1 in a million for cancer, and less than 0.1 for non-cancer Hazard Index. Most districts have permitted facilities within their jurisdiction that do not meet the exemption criteria and, therefore, will report emissions under this program.

Air District Annual Reports
In addition, under HSC §44363(a), districts are required to publish an *annual report*, covering their annual program implementation status. This annual update status report is intended to address (but is not limited to) implementation activities, rank and identify facilities according to the degree of cancer risk posed to individuals and/or to the exposed population, identify facilities which expose individuals or populations to any noncancer health risks, summarize the results and progress of the health risk assessments, and describe the status of the development of control measures to reduce emission of toxic air contaminants. Under HSC §44363(b), the districts must disseminate the annual report to specified entities including county boards of supervisors, city councils and others. Districts generally publish these district "annual reports" on their website each year.

HSC §44363 does not limit the coverage to only high priority facilities.

When does a district need to reevaluate a facility's prioritization score, for both on-going facilities and previously exempt facilities?

California HSC §44344.6 requires that a district shall redetermine a facility's prioritization score[1] within 90 days of receiving a quadrennial emission inventory update from facilities that are on-going in the AB 2588 "Hot Spots" program, and within 90 days of receiving an emission inventory update from facilities that had been previously exempted and become subject again under the provisions of HSC §44344.7.

HSC §44344.7 outlines factors that are required to be considered for emission inventory updates from previously exempt facilities. It also includes rules for district assessment and determining whether changes pose a significant risk or not.

HSC §44344.7 specifies the following changes in the facility or activities that warrant re-evaluation if the facility:

- Emits a substance that was recently added to *Appendix A*
- Has a new receptor established within 500 meters of the facility
- Emits a substance for which the potency factor has increased
- Has now begun emitting a substance listed in *Appendix A*
- Has increased its emissions of a substance in excess of 100 percent of the previously reported level

In addition, HSC §44344.7 allows a district to determine if changes "will not result in a significant risk". Because there are many ways that changes could result in a significant risk, CARB's EICG Section IV.F outlines rules for redesignation and lists factors to evaluate whether a facility poses no significant risk to public health. For example, EICG Section IV.F. states that a facility can be exempted from further reporting and moved to a lower update category only if it shows the district and CARB that specific criteria are met. These criteria include:

1.) Providing updated emission inventory results that meet the EICG's requirements.
2.) Demonstrating that the facility does not pose a significant risk to public health based on the updated emission inventory.

EICG also lists changes a district may consider when determining if a facility poses no significant risk to the public. This includes:

- Emissions quantification methods
- Dispersion modeling methods

[1] Some districts proceed directly to the health risk assessment step after the emission inventory report is completed, typically when it is clear the emissions will exceed their prioritization thresholds. This is allowed under HSC§ 44365(b), 39002, and 40702, which gives districts authority to establish more stringent requirements.

- Risk assessment methods
- Any other hazard evaluation methods
- Building parameters that may affect downwash effects
- Population-wide impact assessment (as opposed to only maximum point estimates of risk)
- Considering the facility's risk individually or in combination with other facilities
- Additional properties of concern including persistence and bioaccumulative properties
- Potential for non-inhalation, multipath way exposures to contribute greater risk (such as through deposition from the air and subsequent exposure via soil, dermal, homegrown produce, and other routes of exposure)

These and many contributors to risk are discussed in the OEHHA risk assessment guidance manual for the AB 2588 Air Toxics Hot Spots program. The latest OEHHA risk assessment activity regarding the AB 2588 program, including the latest OEHHA "Air Toxics Hot Spots Program Guidance Manual" can be found linked from this *OEHHA webpage*.

What should be reflected in Air Districts' prioritization calculation methodologies?

If an air district has not re-evaluated their prioritization calculation methodology since the inception of the program, there are many changes and advancements that should be considered in their risk prioritization calculation methodology.

In August 2016, CAPCOA released updated *Facility Prioritization Guidelines* to incorporate the revised Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments* (February 2015). The purpose for these updates was to incorporate the latest science and tools used for the analysis of toxic substances in terms of dispersion in the environment and health risks associated with human exposure, particularly the recognition of the substantially greater risks due to childhood/early life exposures (than previously understood). It is important to be consistent with the latest OEHHA risk provisions, to ensure that prioritizing of facilities and their subsequent risk assessments fully comply with the requirements stated in the AB 2588 Statute that risk assessments must follow approved OEHHA risk assessment procedures. The 2016 CAPCOA Facility Prioritization Guidelines have new normalization constants in the calculation formulas to properly reflect the OEHHA childhood risk inclusion and be adequately health protective.

In addition, *new health values developed by OEHHA* and the expansion of the *Appendix A list of toxic chemicals* require more chemicals to be inventoried and analyzed as part of the HRA. These additional chemicals should be included in the facility's prioritization score.
Districts may develop their own variations on the CAPCOA facility prioritization methodologies, provided these maintain equivalent public health protection and state of science. For instance, Districts may adopt procedures that include adjustments to prioritization scores based on other factors, such as:

- Recent HRA/Risk Reduction activities for a particular facility

- Recent or upcoming implementation of other enforceable regulations that would reduce public health risk
- Assessment of prioritization score assumptions relative to site-specific or facility-specific information
- Participation in voluntary risk reduction programs
- Data from ambient monitoring of air toxics
- Additional parameters from OEHHA that can be used to calculate health risks, such as Cancer Potency Factors (with explicit inclusion of breathing rate, body weight, distributions, etc.), 8-hour Chronic Reference Exposure Levels, multipath way exposure factors, etc.

Because prioritization scores are intended to be a preliminary indicator of a facility's potential risk, it is no longer sufficient to use the previous CAPCOA Facility Prioritization Guidelines, released in July 1990. Similarly, any air district methodology that was established prior to 2015 should be re-evaluated to ensure that the prioritization procedure is still the most health protective.

How can I get more information about Hot Spots?

General information about Hot Spots can be found *here*. Sign up for our email list serve to receive updated information *here*. CARB compiles emissions data for all facilities subject to Hot Spots. This information is publicly available on our *Facility Search Tool*.

Facilities, Operators and Devices

How does AB2588 Hot Spots Statute define "facility" and how is it intended to be used for the AB2588 Hot Spots program?

For purposes of the AB2588 Hot Spots program, the Statute [Health and Safety Code (HSC) §44304] provides the following definition of "Facility":

> *"Facility" means every structure, appurtenance, installation, and improvement on land which is associated with a source of air releases or potential air releases of a hazardous material.*

The Statute's definition makes clear the broad, encompassing nature of the applicability of the Hot Spots program. As a practical matter for implementing the Statute's provisions by the air pollution control and air quality management districts (districts) on stationary sources over which they have jurisdiction (e.g., not motor vehicles), the EICG Regulation adopted by CARB (as required by the AB2588 Statute) further defined the phrase "every structure, appurtenance, installation" in order to better align with the provisions already established by the U.S. EPA for "stationary sources" for New Source Review (NSR).

The EICG Regulation Section X definitions therefore contain the following definition of "Facility" for AB2588 implementation purposes:

> *(14) **"Facility"** means the same as defined in HSC §44304. "Facility" shall not include any motor vehicle as defined in Section 415 of the Vehicle Code.*
>
> *(a) Except for the oil production operations defined in Section X.14(b), for purposes of this regulation, the phrase "every structure, appurtenance, installation" shall mean all equipment, buildings, and other stationary items, or aggregations thereof, (A) which are associated with a source of air emission or potential air emission of a listed substance; (B) which involve activities that belong to the same two-digit Standard Industrial Classification code, or are part of a common operation; (C) which are located on a single site or on contiguous or adjacent sites; and (D) which are under common ownership, operation, or control, or which are owned or operated by entities which are under common ownership, operation, or control.*
>
> *(b) For oil production operations in the counties of Kern and Fresno, the phrase "every structure, appurtenance, installation" shall mean the same as "stationary source" defined in Section 3.0, "Definitions" (Section 3.39 definition of facility "Stationary Source") in San Joaquin Valley Unified Air Pollution Control District Rule 2201 "New and Modified Stationary Source Review Rule" as amended February 18, 2016, which is incorporated by reference herein.*

X.14(b) was needed because oil fields have been historically handled differently for NSR due to their unique geophysical boundaries.

Subsection X.14(a) makes it clear that the appropriate extent of aggregation of various stationary items for implementation purposes is intended to include multiple activities at a site, as emphasized in the bold phrases shown below:

> (A) which are associated with a source of air emission or potential air emission of a listed substance;
>
> (B) which involve activities that belong to the same two-digit Standard Industrial Classification code, **or are part of a common operation**;
>
> (C) which are located on a single site **or on contiguous or adjacent sites**; and
>
> (D) which are under common ownership, operation, or control, or which are owned or operated by entities which are **under common ownership, operation, or control**.

Combined with the AB2588 Statute's definition of "Operator" (see the following discussion regarding HSC §44307) as the person who "owns or operates a facility or part of a facility", implementation of the AB2588 provisions is intended to be inclusive of multiple operations that are co-located where there is common ownership, operation, or control. "Common ownership operation or control" is not defined for purposes of the EICG and may therefore involve a case-by-case review by the local air district. For example, a district evaluating information presented by co-located facilities may conclude based on available facts that all co-located operations constitute a "facility" for purposes of preparing a combined health risk assessment.

The inclusive nature of the definition of facility has been emphasized over the many years of Hot Spots implementation and was meant to align with the similarly inclusive nature of the stationary source definition for NSR. Moreover, it is meant to align with the broad public right-to-know provisions and public-health protective risk reduction provisions of the AB2588 Statute.

In CARB's view, it would be inconsistent with the broad public right-to-know intent of the AB2588 program to subdivide multiple, co-located operations that are under one owner's "common ownership, operation, or control" such that, for example, they individually do not trigger risk-based thresholds (for public notification and/or risk reduction), but collectively would trigger these risk-based thresholds.

Similarly, certain reporting provisions such as the use of the "reporting degree of accuracy" under the EICG Regulation, are meant to be applied on a broad facility-wide basis to ensure reporting of collective amounts of a given toxic substance. Subdividing co-located operations could lead to

inappropriate under-reporting or lack of reporting of toxic substances that collectively would meet the reporting degree of accuracy thresholds.

How does the AB2588 Hot Spots Statute define "Operator" and how does this affect who is responsible under the of the Hot Spots Regulation?

For purposes of the AB2588 Hot Spots program, the Statute contains the following definition (HSC §44307) of "Operator":

> *"Operator" means the person who owns or operates a facility or part of a facility.*

For brevity, the remainder of the AB2588 Hot Spots Statute uses the defined term "operator" when specifying requirements for the facility; however, the definition in HSC §44307 makes it clear that the term "operator" refers to either or both the person who owns or operates a facility or part of a facility. Responsibility for complying with all provisions of the AB2588 Hot Spots program therefore are applicable to either or both a person who owns or operates a facility or part of a facility. Therefore, if an operator of part of a facility does not comply with program requirements, the owner of the facility is still ultimately responsible for compliance with all program requirements. The EICG Regulation also references this same definition as in the AB2588 Statute.

Are cumulative emissions from multiple facilities addressed under Hot Spots?

Cumulative effects can be addressed in various ways under EICG and the Hot Spots Statute. Under the AB 2588 Statute, within the legislative findings, Section 44301(d) says "these releases may create localized concentrations of air toxics Hot Spots where emission from specific sources may expose individuals and population groups to elevated risk of adverse health effects including, but not limited to, cancer and contribute to the cumulative health risks of emissions from other sources in the area." The Hot Spots EICG Regulation requires that the cumulative emissions from all equipment and pollutants at a single facility be evaluated, but there are no direct requirements to address emissions from multiple facilities within a given area. However, provisions were added in the EICG amendments that describe considerations, including cumulative impacts, that districts may consider, such as when reinstating facilities, evaluating exemptions, approving permits, and considering the extent of update requirements. For example, EICG Section II states that "the districts may voluntarily consider population-wide impact assessments and the potential for cumulative risk from multiple facilities in granting an exemption from further compliance or in determining reinstatement."

Other efforts that considering cumulative impacts include the EPA's framework for cumulative risk assessment and CARB's Industrywide Guidelines for gas service stations.[2] [3] EPA's cumulative framework identifies the basic elements of the cumulative risk assessment process and provides a flexible structure for conducting and evaluating cumulative risk assessment, and for addressing scientific issues related to cumulative risk. CARB's gasoline service station industrywide supplemental guidance includes recommendations for gas station operators, local governments, and districts to reduce community scale health impacts from new and existing gas stations, especially in areas where multiple gas stations are clustered near where people live and work. In addition, The California Air Toxics Assessment (CATA) represents a comprehensive state-of-the-science assessment of toxic air contaminants (TACs) in California. CATA is a unique model-based approach that leverages CARB's comprehensive TACs emissions inventory and state-of-the-science modeling techniques to estimate ambient concentrations of Diesel Particulate Matter (DPM), heavy metals, and toxic Volatile Organic Compounds (VOCs), which are used to estimate cumulative cancer risk following OEHHA guidelines for inhalation exposure. CATA results are scalable from statewide averages down to the community level (census block/tract averages), which may be different from maximum cumulative risk at a specific location within a census block/tract. CATA is updated on a triennial basis and will incorporate EICG reported data through the Comprehensive California Toxics Inventory (CTI) as it becomes available.

Can Districts establish more stringent requirements than those specified in the EICG Regulation?

HSC §44365(b), 39002, and 40702 give districts the authority to establish more stringent criteria and requirements for the approval of emission inventories than those specified in the EICG. For example, districts can require source testing for processes or substances not listed in Appendix D if they believe the source is significant and that the source test will provide a better characterization of emissions than an estimation method. Districts can also require additional information for source test protocols if they believe the information is needed to ensure adequate source test results.

Is there a remote location exemption from reporting under the Hot Spots Program?

No, all facilities subject to Hot Spots must report their emissions. However, because Hot Spots is risk based, emissions that occur far away from people and residences have less impact on public health and are less likely to require a risk assessment.

[2] (*US EPA, 2003*). Framework for Cumulative Risk Assessment.

[3] (*CARB, 2022*). Gasoline Service Station Industrywide Risk Assessment Supplemental Policy Guidance

How can a facility submit to the district an "Update Emissions Summary Form" that can be used to modify prioritization, health risk assessment values and demonstrate reductions in risk?

In EICG Section V.G., if a facility's previous emission inventory report has been approved by the district, and a district allows a facility operator to use revised inventory data for prioritization or risk assessment, the facility operator shall submit an update report to the district which reflects any changes from the previously submitted and approved emission inventory report. The district shall submit this updated inventory to CARB. EICG Section V.H. includes details on what facility operators should do and what factors districts should look out for in their review. The "Update Summary Form" (Form-US) can be found in EICG Appendix B-II on page "B-II -30" on the CARB website *here*.

How are on-site dust emissions and refueling from mobile sources treated for purposes of the Hot Spots Program?

It is the intent of the Hot Spots program to ensure a comprehensive characterization of the toxic releases from facilities. EICG Section VIII.G. addresses how on-site mobile sources are covered under the Hot Spots program to ensure this. For routine and predictable motor vehicle activity at the facility, dust emissions are to be included in reporting, as are vehicle refueling and fuel tank storage emissions; and activity data regarding usage of motor vehicles at the facility may be required to be reported. For other mobile sources (non-motor-vehicle sources) which operate within the facility, these sources are also covered by certain reporting requirements. For sources that stay within the facility property, the emissions must be included in the Hot Spots reporting. For sources that are periodically located within the facility property, the facility is required to report activity data regarding the usage of the sources.

What are portable diesel engine reporting requirements for engines greater than 50 horsepower at certain large facilities?

Section XI.C.(2)(c) requires that diesel emissions from portable diesel engines are required to be reported at certain large facilities (i.e., those that report to the Greenhouse Gas (GHG) Mandatory Reporting Regulation (MRR) and emit over 250 tons of criteria pollutants). Only engines greater than 50 horsepower (hp) are included. This ensures collection of diesel exhaust data from portable equipment at large facilities, which can be a significant source of toxics risk.

What if the facility's equipment is not permitted?

If the facility is subject to Hot Spots, it does not matter if the equipment is permitted. All sources within facilities subject to the regulation must be included in the emission inventory. However, for facilities that are reporting under the Regulation for the Reporting of Criteria Air Pollutants and Toxic Air Contaminants (or CTR), only permitted equipment is subject to reporting.

Source Testing and The Two-Step Process

What facilities are subject to the two-step process?

The two-step process, which includes qualitative screening followed by quantitative testing, applies to waste-handling facility operators meeting the requirements for classes of facilities in Phase 3B of *Appendix E*, or those that emit more than 10 tons per year of criteria pollutants. The following sectors from *Appendix E* are applicable: landfills (Sector 48), composting facilities (Sector 49), material recycling/recovery facilities (Sector 50), metal shredding and dismantling facilities (Sector 51), and wastewater treatment plants including publicly owned treatment works (Sector 52).

More information on the sectors, including the SIC/NAICS codes and activity level reporting thresholds, can be found in *Appendix E* of the EICG Regulation.

What is the two-step process?

The 2022 EICG Regulation amendments include additional source test requirements for waste-handling facilities. Specific requirements for source testing are described in Section IX and listed in *Appendix D* of the EICG. Waste utilities are unique in that they accept waste streams from many sources, including industrial, commercial, residential storm water and other sources that may include a variety of toxic substances. Because of this, their waste streams may potentially contain toxic substances that require reporting under the EICG Regulation. The two-step process was included as an EICG amendment to comprehensively detect and measure the broad spectrum of toxic substances emitted into the air from waste-handling facilities.

For the first step of the two-step process, facility operators shall submit an initial emission inventory plan that includes proposed testing protocols for *qualitative screening (step 1)* of representative open sources. The testing protocols shall be designed to identify or screen for all listed substances for purposes of emission quantification in the second step. Upon approval of this initial screening plan proposal, waste-handling facilities shall proceed with completing a second protocol for full *emissions quantification (step 2)* of the substances identified in the first step, with source testing as the required method of quantification whenever feasible. The first step can be thought of as a way to inventory the full list of substances found in waste streams, while the second step focuses on measuring the substances detected in the first step to the extent feasible (or otherwise estimating or quantifying them).

For further information on two-step process facility phase-in schedules, the submission process to districts, and the role of the Executive Officer of CARB (i.e. the state board) in reviewing first-step and second-step emission inventory plans, please refer to Section IX.H of the *EICG* and HSC §44340 and §44341.

Do facility operators subject to the two-step process have to fully quantify Appendix A substances that do not have OEHHA-approved health values?

Yes, all *Appendix A* substances must be reported, and all *Appendix A-I* substances need to be quantified using best available quantification methods. For facilities subject to the two-step process requirement, it follows that all *Appendix A* substances will need to be included in the initial qualitative screenings.

Appendix A was constructed using data from a variety of sources that have conducted research and determined that all substances present a chronic or acute threat to public health when present in ambient air. The emissions data collected by the EICG program is continuously evaluated by CARB in collaboration with OEHHA to determine priorities to develop full OEHHA approved risk assessment potency values.

For a more detailed discussion of the importance of addressing all substances including those that do not yet have OEHHA health values, please see the FAQ item entitled "Why is reporting of emissions required for all chemicals even if they don't currently have an OEHHA health value?", which is under the section topic header "Required Reporting of Toxic Substances and Appendix A".

Do facility operators subject to the two-step process have to fully quantify Appendix A substances that do not have CARB-approved source testing methods?

Yes, all *Appendix A* substances need to be quantified using best available reference test methods and the sample collection techniques prescribed by the methods, when feasible. For substances that are demonstrated to not have a reference analytical method or feasible sample collection technique, a full justification for an alternative method will need to be provided in the emission inventory plan for review and approval. Best available methods will vary depending on the specific substance and process. They are not necessarily maximum emissions values, potential to emit, or prescriptive limits established by permitting or regulation, unless those values provide the most accurate estimates available. The proposed alternative method needs to include all components of information required under Section IX and will be reviewed by both the District and CARB.

What analytical techniques are approved for source testing?

There is no list of approved analytical techniques to satisfy this requirement. Analytical techniques are prescribed by the applicable test method. Facilities are expected to use the best available test methods to perform the two-step process. As this requirement involves both a qualitative screening of the *Appendix A* substance list, and subsequent emissions quantification, it is likely that a large variety of analytical techniques will be used in the process. It is expected that facilities will utilize a wide breadth of analysis methods in the process. For example, methods such as, but not limited to Gas Chromatography-Mass Spectrometry (GC-MS), Inductively coupled plasma mass spectrometry (ICP-MS), liquid chromatography mass spectrometry (LC-MS), and

High-performance liquid chromatography (HPLC) would be expected to be used in the initial screening step.

The previously stated mass spectrometry variants can be used to screen for inorganic compounds, organic compounds, elemental metals, and transition metals, including complex compounds with a GC-MS index. Mass spectrometry is routinely used to quantify toxics such as dioxins, benzene, and various metals such as beryllium; but its adaptability makes it a useful resource to screen for substances that have not yet been identified as toxic or carcinogenic.

When selecting a test method, the sample collection methodology and its applicability to the process stream being sampled should be considered. For example: quantifying volatile compounds in aqueous media may be desired using a U.S. EPA TO Compendium Method that requires the sample be collected in an evacuated canister, which is not applicable. Instead, collecting a "grab sample" of liquid in a suitable sample container and analyze the headspace for the volatile compounds of interest could be proposed. As a screening method, the liquid could be analyzed for the compounds of interest and then estimate their prevalence to be airborne or entrained.

Can water testing be used to help wastewater treatment plants in their reporting of Appendix A substances?

Yes. While the EICG ultimately requires reporting of air emissions (which may require air sampling, such as flux chamber sampling), there may be situations where wastewater treatment plants can utilize water sampling in conjunction with air sampling, particularly as part of the first screening step to detect the presence of Appendix A substances. Some substances may be more easily detected at higher concentrations in the water sampling than air sampling, which will allow for more consistent, and potentially lower cost, screening detection. Further, the results of water testing at the influent and other appropriate locations may be able to be used in conjunction with appropriate engineering calculations to calculate airborne emissions (without direct air sampling) for some substances. Additionally, chemical reactions may occur within the various wastewater treatment plant processes that could form secondary toxic substances of concern that then could become airborne and would need to be reported.

When are facilities that are subject to the two-step process required to complete it?

Emissions from waste handling facilities may continue to use their current emissions estimation methods through data year 2027. For data year 2028 emissions, waste handling facilities are required to report emissions using the results from the two-step process.

Due to the involvement and complexity inherent to the two-step process and protocol, it is expected that the process will be a multi-year effort. Because of this, it is recommended that facilities begin the process sooner rather than later.

Does every facility need to perform the two-step process?

Every applicable individual facility is required to complete and satisfy all the steps outlined in Section IX.H regarding the two-step process, which are summarized in this document under "What facilities are subject to the two-step process?"

However, groups of related facilities may opt to participate in pooled source testing by performing several representative source tests and applying the results to each of their respective facilities. Such a proposal shall be submitted for district review and approval with the source test protocol in the emission inventory plan. For waste handling facilities, the pooled source test proposal is also submitted to CARB for a 45-day review period.

What are some benefits of pooled source testing for the two-step process?

Due to the involvement and complexity inherent to the two-step process and protocol, it may be costly for individual facilities to take on these requirements individually. Combining financial and staff resources for the two-step process can save time and money. Information on pooled source testing is found in Section IX.B of the *EICG*. (Pooled source testing is an option provided for all types of facilities subject to source testing requirements under the EICG).

How does EICG Section IX provide a hierarchy from source testing to emission estimation?

EICG Section IX is organized starting with sources for which Appendix D requires source testing and measurement (some small business alternatives are also provided in Appendix D). Following, Section IX provides options for pooled source testing, and various alternatives to required source testing including alternatives to required source testing such as using CARB approved emission factors derived from the Hot Spots source tests as described in Section IX.D. other cases, where source testing is not explicitly required, Section IX provides specifications for acceptable estimation methods, emission factors, engineering calculations, and other approaches that can be used to quantify emissions. See EICG Section IX for the details, and how to ensure emissions are characterized to the degree of accuracy required by Section VIII.E.

Required Reporting of Toxic Substances and Appendix A

Which pollutants must be reported under AB 2588 and by when?

Appendix A of the EICG includes a list of substances that must be reported, and it is divided into three sub-appendices. Appendix A-I includes substances for which emissions must be quantified, Appendix A-II includes substances for which production, use or other presence must be reported, and Appendix A-III includes substances which need not be reported unless manufactured by the facility.

Reporting of Appendix A-I substances are to be phased in between data years 2022 through 2028. Substances in Appendix A which are denoted in the "Effective Phase" column as "ChemSet1" or "ExistGrp", have an effective initial emission data quantification year of 2022 shown in Table 2 from EICG Section II.H(2) and for the applicable District Group as shown in the EICG Appendix E, Table E-2.

The "ExistGrp" term is used for existing metals, where the "metals and their metal compounds" have already been included on the existing Appendix A list.

Substances added to Appendix A, which have no delayed phase-in provisions denoted in the "Effective Phase" column of Appendix A, are denoted as "e" for existing substances which were part of Appendix A prior to the 2020 amendments. See EICG Section II.H, Appendix A as well as Appendix E for more details.

EICG Section II.H(2) Table 2. Effective Initial Emission Data Quantification Year for New Substances

	Effective Initial Emission Data Quantification Year for New Substances		
District Group	ExistGrp	ChemSet-1	ChemSet-2
A	2022	2022	2026
B	2024	2024	2028

How many chemicals were added to Appendix A in the 2020 EICG amendments?

The EICG Appendix A chemical list now includes 1,925 chemicals. Appendix A-I includes 1,457 chemicals (including 3 broad functional groups), A-II includes 184 and A-III includes 284. During the 2020 EICG amendment process, 994 chemicals were added to A-I, 13 to A-II and 162 to A-III. (In a few cases, a chemical was moved from A-II to A-I). It is important to note that some chemicals were listed in an individual alphabetical location with the phrase "(see…)", this indicates that the

main listing is under a broader group of chemicals as well as the alphabetical location. Additionally, in a few cases, staff found more than one CAS number for essentially the same chemical, those use the notation "(alt. CAS, see CAS…)". This is important to note because duplicates must be removed to get a unique count of the chemicals as calculated above. Further, there are 194 chemicals in ChemSet-1 (including 2 functional groups) and 765 ChemSet-2 chemicals.

Why is reporting of emissions required for all chemicals even if they don't currently have an OEHHA health value?

It is important to include reporting of emissions of substances even if they do not yet have a formal health value to understand the types, distribution, and extent of sources that are known to have public health impacts. In addition, it assists in identifying priorities for formal health value development, as well as priorities for improvement of emission quantification methods if they are needed. Section II.H(5) of the EICG Regulation allows facility operators to report only the amounts present, used or produced when no emission quantification method exists for a substance at the time of its scheduled phase-in. This is a necessary first step in understanding the potential for public health impacts from a particular facility or a particular chemical. Understanding the nature and extent of emissions is one of the necessary items that helps OEHHA establish priorities for development of health values.

Reporting of the listed chemicals is also crucial to characterizing many emerging chemical hazards and it enhances the public right-to-know intent of the Hot Spots program. It ensures that facilities consider all toxic emissions when evaluating the nature of operations and potential for public health impacts, as well as the full range of potential options to make less toxic process and chemical choices. All the chemicals included in the EICG Appendix A list are there due to identification of information noting the potential for adverse health effects, whether or not an exact dose-response value has yet been formally adopted.

What was considered in assigning the first phase chemicals (ChemSet-1)?

The intent of ChemSet-1 was to focus the first phase of reporting on the highest priority chemicals that should be quantified. The 194 chemicals which are denoted as ChemSet-1 chemicals are high priority for their potential for public health impacts. Prioritizing the reporting of these chemicals in the first phase under ChemSet-1 is imperative for protecting public health not only to begin to collect data on where and how much their usage is occurring, but also to provide a clear direction to industries that there are toxicity issues that must be evaluated and recognized.

The ChemSet-1 chemicals were selected based on several considerations. Some of the key considerations for assigning groups of chemicals to "ChemSet-1" include:

(a) Chemicals with available health data, particularly OEHHA health values.

(b) Chemicals that are known carcinogens (e.g., IARC and Proposition 65). [4] [5]
(c) Chemicals that US EPA denotes as "exempt" from being treated as Volatile Organic Compounds (VOCs) for purposes of smog pollution, but which have toxicity of concern, especially if usage were to increase. Examples include parachlorobenzotrifluoride (PCBTF)[6], t-Butyl acetate (TBAc) [7], and n-Propyl bromide[8]and others.
(d) Fumigants that facilities may use, such as on harvested commodities.
(e) High production volume chemicals.
(f) Chemicals that exhibit persistence and bioaccumulation.
(g) Other chemicals of concern, such as chemicals raised by the Scientific Review Panel, rare earth and other metals,[9] [10] and isocyanate-related chemicals.
    a. For example, some isocyanate-related chemicals can occur at neighborhood sources, such as autobody shops, and may promote the development of asthma, and may create a heightened allergic response in sensitized persons.
(h) Choosing a few key instances of the chemicals of greatest concern within some of the very large groups, including the large groups such as PFAS, Phthalates and flame retardants.

How did CARB determine the groupings of some of the chemicals in EICG's Appendix A (e.g., xylenes, metal compounds, glycol ethers, PAH compounds, functional groups, and others)?

The AB2588 EICG Regulation Appendix A substance list contains many groupings and group headers. These groups and group headers have come about over the years for a few different reasons, primarily related to the extent of shared health effects and/or chemical similarities. The reporting of emissions for these groups differs accordingly. See EICG Section VIII.F., the EICG Appendix A and its Notes, and the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values and its footnotes for more details.

In order to provide the most relevant information for evaluating public health impacts and potential reduction or control opportunities, it is generally preferred or required for each individual substance within a group to be reported individually.

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[4] (*OEHHA, 2023*). The Proposition 65 List. Office of Environmental Health Hazard Assessment
[5] (*IARC, 2020*). IARC Monographs on the Identification of Carcinogenic Hazards to Humans. International Agency for Research on Cancer; June 26, 2020.
[6] (*OEHHA, 2020*). p-chlorobenzotrifluoride Cancer Inhalation Unit Risk Factor Technical Support Document for Cancer Potency Factors Appendix B. Published August 2020.
[7] *(OEHHA, 2019b).* Technical Support Document for Cancer Potency Factors: Methodologies for derivation, listing of available values, and adjustments to allow for early life stage exposures. June 1, 2009.
[8] (*CDPH, 2016*). Hazard Evaluation System and Information Service (HESIS), 1- Bromopropane Background. California Department of Public Health. Published December 2016.
[9] (*SRP, 2019a*). SRP Transcript: CARB 2588 Air Toxics Hot Spots Presentation; June 28, 2019.
[10] (*SRP, 2019b*). SRP Transcript: AB 2588 EICG Proposed Revisions to Appendix A Chemical List; October 4, 2019.

The main types of groups and group headers are summarized below.

- Aggregate reporting: In a few cases, emissions are allowed to be reported in the *aggregate* for a group. For example, when the health effects values can be applied equally across all the instances within an entire group and the group has a reportable Emittent ID, which can be a CAS number or a 4-digit CARB ID number. This is the case for mixed Xylenes, for example, which can be reported in the aggregate using the CAS number available for mixed Xylenes.

- Metal compounds: In some cases, the notation in the group header is used to convey that the reporting of the "metal atom equivalent" in a metal compound's overall weight is an appropriate way to apply the OEHHA cancer potency value to metal-containing compounds. However, for certain metals, further separate subgroups are maintained in order to match to OEHHA's health values. One example is the separation of Cobalt-containing compounds into "soluble" vs. "insoluble" due to differing OEHHA health values for those forms. Other examples include the separation of "inorganic" forms of Arsenic compounds, and the separation of the hexavalent forms of Chromium, because these are the forms that correspond to the OEHHA health values.

- Contextual group headers: In other cases, the group header is not reportable, but rather serves as a convenience header to provide organization, context, and clarity to the chemically related substances in the group, while still maintaining that the individual substances are intended to be individually reportable. Examples of this include the contextual group headers for Glycol Ethers, numerous PFAS chemicals, Polycyclic Aromatic Hydrocarbons (PAHs), and Methyl PAHs. In some of these cases, Appendix A lists the same chemical in two places: once alphabetically by name, and once within the overarching group. This was done to better assist facility operators who might look for the chemical in either place within the Appendix A list and a cross-reference notation is used in those cases.

- Chemical functional groups: To address the ever evolving and emerging chemicals in several important categories, the most recent EICG amendments have added a new concept regarding chemical "functional group" classes on the Appendix A list. To date, three broad functional group classes have been defined: for isocyanate-related substances, halogenated PAH-related substances, and several subclasses of PFAS-related substances. Any chemical containing the "functional group" is included in the Appendix A list of reportable substances. Please see the Functional Groups FAQ section for more details

CARB staff coordinates closely with the Office of Environmental Health Hazard Assessment (OEHHA) in developing appropriate use of the various groups and headers to ensure proper alignment of the groups with available information on cancer and noncancer health effects.

What is the degree of accuracy and how is it used for reporting under Hot Spots?

The "applicable degree of accuracy for reporting" for each substance can be found in Appendix A-I, alongside the substance name. The Statute requires CARB to ensure that the level and accuracy of emission reporting will be sufficient to be used for characterizing exposure and risk (HSC §44342). For this reason, CARB staff developed the reporting degree of accuracy to communicate to facility operators how accurately they need to report their emissions. For example, for a highly potent metal like hexavalent Chromium, the emissions must be reported out to several decimal places in pounds per year (0.001 is the specified degree of accuracy), to ensure that the reported emissions will be useful enough to evaluate the possible public health implications for that facility. By contrast, the emissions of benzene are sufficiently accurate when reported to the nearest two pounds per year, and the emissions of toluene to the nearest 200 pounds per year. The reporting degree of accuracy (RDOA) serves as a practical limit for how emissions should be quantified in consideration of relative toxicity, and one-half the degree of accuracy acts as a de minimis consideration to communicate levels of emission reporting below which the risk should be minimal. See EICG Section VIII.E. and Appendix B-II, Emission Information Form, item (16) for details on using degree of accuracy values.

How is the Molecular Weight Adjustment Factor (MWAF) used for metals?

For most of the Hot Spots toxic metals, the Office of Environmental Health Hazard Assessment (OEHHA) cancer potency factors and noncancer reference exposure levels (RELs) apply to the weight of the toxic metal contained in the overall compound. This was established from scientific studies showing the observed health effects generally track the weight of the metal atom equivalent, not the weight of the overall particular compound.

Some of the Hot Spots compounds contain various elements along with the toxic metal atom (e.g., "Nickel hydroxide", CAS number 12054-48-7, has a formula of H_2NiO_2). Therefore, an adjustment to the reported pounds of the overall compound is needed before applying the OEHHA cancer potency factor and noncancer RELs for "Nickel and compounds" to such a compound. This ensures that the cancer potency factor and noncancer RELs are applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal. In other cases, the Hot Spots metals are already reported as the metal atom equivalent (e.g., CAS 7440-02-0, "Nickel"), and these cases do not use any further molecular weight adjustment. (Refer to Note [7] in *Appendix A*, List of Substances in the EICG Regulation for further information on how the emissions of various Hot Spots metal compounds are reported.)

The appropriate molecular weight adjustment factor (MWAF) to be used along with the OEHHA cancer potency factors and noncancer RELs for each of the Hot Spots metals can be found in the MWAF column of the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values*.

So, for example, assume that 100 pounds of "Nickel hydroxide" emissions are reported under CAS number 12054-48-7. To get the Nickel atom equivalent of these emissions, multiply by the listed MWAF (0.6332) for Nickel hydroxide:

100 pounds x 0.6332 = 63.32 pounds of Nickel atom equivalent

This step should be completed prior to applying the OEHHA cancer potency factor and noncancer RELs for "Nickel and compounds" in a calculation for a prioritization score or risk assessment calculation.

For more information on MWAF please refer to Section 4.2.1.1.1 of OEHHA's *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments* (Guidance Manual) (February 2015).

Note Regarding HARP Software: The HARP software automatically applies the appropriate MWAF for each Hot Spots chemical (by CAS number), so the emissions should not be manually adjusted when using HARP. Therefore, if using HARP, you would use 100 pounds for Nickel hydroxide and HARP will make the MWAF adjustment for you. (If not using HARP, you would use 63.32 pounds.)

Special Cases: There are a few special cases regarding the MWAF field that are noted here.

Asbestos (and related forms under the group "Mineral fibers, other than man-made"): The value listed in the MWAF column for Asbestos is not a molecular weight adjustment. This is a conversion factor for adjusting mass and fibers or structures. See Appendix C of OEHHA's *Guidance Manual* (February 2015) for more information on Asbestos reporting and risk assessment information. Also see the Asbestos footnote (designated by the letter f) in the *Consolidated Table*.

Lead chromate: Some metal compounds consist of multiple components where both components have toxicity and may have OEHHA health values. As an important example, Lead chromate has toxicity due to both the Lead and the hexavalent Chromium in the compound. But because the very high cancer potency for hexavalent Chromium would generally contribute more to risk than the toxicity concern from the Lead, the MWAF value listed in the *Consolidated Table* for Lead chromate is based on the weight of the Chromium in the compound (not the Lead). Only a single MWAF field can be stored in CARB's table, so the value listed is for the weight fraction of the Chromium in the Lead chromate molecule. However, the Lead fraction can be calculated.

If someone wanted to compile a comprehensive inventory focused specifically on "Lead", they would include the Lead chromate with their Lead inventory and they would need to calculate their own "weight of Lead" fraction for it (knowing the periodic table and the molecule's formula $PbCrO_4$, giving a Lead fraction of 0.6411)

Functional Groups

What is a functional group?

The concept of functional group classes was introduced into EICG in 2020 and applies to several chemical "families" of known concern. These families have a portion of their chemical structure that is understood to be the "family trait" (referred to as the chemical "functional group") that is responsible for similar chemical and biological behavior, both of which give rise to adverse health effects for the entire chemical "family". Adding functional groups to EICG ensures that all

chemicals in that "family" are reported and that reporting is comprehensive and up to date regardless of whether new variations of the chemicals are introduced.

Appendix A is revised to include three types of chemical functional groups for which emissions of any substance having the functional group must be reported. These chemical functional groups include: 1) any chemical containing an isocyanate functional group, 2) derivatives and substituted versions of polycyclic aromatic compounds that contain any halogen atom, and 3) poly and per fluorinated chemicals (or PFAS-related chemicals). The PFAS-related chemicals are further divided into the following eight subclasses[11] [12] [13]:

a) Perfluoroalkyl sulfonyl, sulfonic acid, sulfonate and sulfonamide compounds
b) Perfluoroalkyl phosphate compounds
c) Fluorotelomer-related compounds
d) Per- and polyfluoroalkyl ether-based compounds
e) Other PFAA precursors and related compounds - perfluoroalkyl ones
f) Other PFAA precursors or related compounds – semi fluorinated
g) Fluoropolymers

The chemical "functional group" classes are listed at the end of EICG Appendix A-I, and their reporting provisions are covered in Sections II.H. and VIII.E.(3) of the EICG and Note [22] to EICG Appendix A.

How do functional groups get reported in CEIDARS[14]?

The facility operator should report the CAS number and complete chemical name for any substance meeting the definition of this functional group class as defined above. The *Supplemental Use Production Form (S-UP)* transaction format is being modified to allow reporting of a new chemical name, as well as the CAS number. Please see EICG Appendix B-II page 27-30 for more information, including the reporting form.

New Chemicals, Health Values and Prioritization

How can I notify CARB about a new chemical of concern?

An interested party may submit a petition to the Executive Officer of the state board to request the addition of one or more substances to Appendix A via *ab2588ei@arb.ca.gov* . The petition must include the chemical name (common name or IUPAC) and any information the interested party

[11] (*OECD, 2020*). Portal on Per and Poly Fluorinated Chemicals. Organization for Economic Cooperation and Development.
[12] (*Kwiatkowski, 2020*). Scientific Basis for Managing PFAS as a Chemical Class. Environ. Sci. Technol. Lett. 2020, 7, 8, 532-543. Kwiatkowski et. al. Published June 30, 2020.
[13] (*CFR, 2019*). 40 CFR 721. Significant New Use Rules on Certain Chemical Substances (19.4.B). Environmental Protection Agency. July 31, 2019.
[14] CEIDARS stands for The California Emissions Inventory Data Analysis and Reporting System - the database management system developed to track statewide criteria pollutant and air toxic emissions.

has on the chemical (e.g., where it may be emitted from, literature on the potential for chronic or acute health concerns, the potential for the substance to become an airborne, and the CAS number, if available). The Executive Officer will acknowledge the request within 90 business days, and if appropriate (as authorized by HSC §44321, subdivision (f)), the addition of the substance will be considered for the next update of Appendix A. See EICG Section II.H(4).

How does CARB prioritize new chemicals of concern?

As part of the Hot Spots Program, CARB and OEHHA have a contract agreement that includes priorities for the Hot Spots Program including the list of chemicals. The AB 2588 Hot Spots fees that facilities pay based on their health risk levels fund this contract work. In this contract, OEHHA assists CARB and the districts in all aspects of the Hot Spots Program that involve identifying, assessing, and communicating the health effects of toxic and potentially toxic substances. This includes thorough review of candidate chemicals for inclusion on the EICG Appendix A list of substances, based on the source references and authority provided in Health and Safety Code section 44321. This also includes the development of acute, 8 hour, and chronic Reference Exposure Levels (RELs) and Cancer Potency Factors by OEHHA for substances in the Hot Spots program (through a process that includes review by the Scientific Review Panel for Toxic Air Contaminants and a public comment process). Determining priorities for development of health values entails keeping up to date on toxicology, epidemiology, and exposure assessment literature as it relates to Hot Spots risk assessment. In developing the priority list of substances, OEHHA and CARB discuss what chemicals have emerged within industry as well as the current toxicity studies and community-based concerns. With the recent EICG 2020 amendments, and with future amendments, it is CARB's intention to update the Appendix A chemical list more regularly as new and emerging chemicals of concerns are found through OEHHA's findings or community concerns.

What happens when pollutants are assigned a new health value?

When new health values are adopted by OEHHA, they are included in the Hot Spots Analysis and Reporting Program Air Dispersion Modeling and Risk Assessment Tool (HARP). OEHHA reviews new facility risk assessments and confirms the district included the new health value in their risk assessment. The district also reevaluates facilities already subject to AB 2588 that emit substances with new health values to determine if an updated health risk assessment is necessary. All current OEHHA health values can be found in the "Consolidated Table" of OEHHA/CARB Approved Risk Assessment Heath Values *here*. This table continues to get updated when there are new or revised health values adopted.