



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

WORKSHOP REPORT

PRELIMINARY DRAFT AIR DISTRICT REGULATION 12, RULE 15: PETROLEUM REFINING EMISSIONS TRACKING

Prepared by the staff of the
Bay Area Air Quality Management District

March, 2013

1. INTRODUCTION

This report was prepared to provide information relevant to the development of a new rule by the Bay Area Air Quality Management District (“Air District”) which would apply to petroleum refineries located in the San Francisco Bay Area. The proposed title of this new rule is *Regulation 12, Rule 15: Petroleum Refining Emissions Tracking*. The development of the rule was included as Action Item 4 in the Air District’s *Work Plan for Action Items Related to Accidental Releases from Industrial Facilities*, which was approved by the Air District’s Board of Directors on October 17, 2012. The Air District is seeking input in the development of the new rule from the public and other interested stakeholders, and will be holding public workshops and additional meetings for this purpose.

2. RULE DEVELOPMENT PROCESS

Air District staff develops proposed rules to control emissions from refineries and other types of “stationary sources” of air pollution in consideration of input received from interested stakeholders. Proposed rules are considered for adoption by the Air District’s Board of Directors after a public hearing is held. Before these proposed rules may be adopted (or amended), the Board of Directors must consider certain factors (e.g., socioeconomic and environmental impacts), and make a number of findings (e.g., authority, necessity, clarity, and consistency), based upon relevant information presented at the public hearing. It is expected that the new Petroleum Refining Emissions Tracking rule will be considered for adoption in the first half of 2014.

3. BACKGROUND INFORMATION

Stakeholders interested in participating in the development of the new Petroleum Refining Emissions Tracking rule may benefit from the background information contained in Appendix A of this report.

4. NEED FOR RULE AND REGULATORY CONCEPT

The need for the new rule and the proposed regulatory approach is explained in the Regulatory Concept Paper provided in Appendix B of this report. The new rule is intended to address potential increases in air emissions from Bay Area petroleum refineries that might occur over time, including emission increases associated with the use of lower quality crude slates. The proposed regulatory approach involves the following basic elements.

- A. Establish existing baseline air emissions from each refinery (i.e., the quantities of various air pollutants that are emitted),
- B. Track the quantity of air emissions from each refinery in the future on an on-going basis,
- C. Should air emissions from a refinery increase above baseline levels (in an amount that exceeds specified trigger-levels), require that the cause(s) of the emission

increase be identified, and a plan prepared and implemented to reduce emissions, and,

D. Establish fence-line and community air monitoring systems.

5. PRELIMINARY DRAFT RULE

In order to facilitate discussion and comments, Air District staff has prepared a preliminary draft Petroleum Refining Emissions Tracking rule, which is included in Appendix C of this report. A flowchart that covers the emissions tracking and emission reduction plan elements of the rule is included in Appendix D. Explanations of the various provisions of this preliminary draft rule are provided as follows.

A. Administrative Procedures

As is delineated in the following sections of this report, the new Petroleum Refining Emissions Tracking rule would require refinery owner/operators to submit to the Air District various reports and plans. Air District staff believes that members of the public and other interested stakeholders should have the opportunity to review and comment on these documents. Comments received would be considered by Air District staff prior to taking final action to approve, revise, or disapprove the reports and plans. Commenters would be notified of the Air District's final actions, and approved or disapproved reports and plans would be posted on the Air District's website. The administrative procedures by which the Air District would review and take final action to approve or disapprove the various types of required reports and plans are specified in Sections 12-15-404, 406, and 409 of the preliminary draft rule.

It should be noted that California law specifies that "trade secrets" are not public records. While air pollutant emissions data and air monitoring data may not be considered trade secrets, many other types of information may be (e.g., production data used to calculate emissions data). The definition of "trade secrets" provided in Section 6254.7 of the California Government Code follows.

"Trade secrets," as used in this section, may include, but are not limited to, any formula, plan, pattern, process, tool, mechanism, compound, procedure, production data, or compilation of information which is not patented, which is known only to certain individuals within a commercial concern who are using it to fabricate, produce, or compound an article of trade or a service having commercial value and which gives its user an opportunity to obtain a business advantage over competitors who do not know or use it.

Section 12-15-412 of the preliminary draft rule specifies that a refinery owner/operator may designate as confidential any information required to be submitted under the rule that is claimed to be exempt from public disclosure under the California Government Code. The owner/operator is required to provide a justification for this designation, and must submit a separate public copy of the document with the information that is designated "confidential" redacted.

B. Pollutant Coverage

District staff believes that the new Petroleum Refining Emissions Tracking rule should cover the three primary categories of regulated air pollutants: (1) Criteria pollutants, (2) Toxic Air Contaminants (TACs), and Greenhouse Gases (GHGs). These terms are defined in Sections 12-15-211, 217, and 227 of the preliminary draft rule.

The definition of TAC provided in Section 12-15-227 of the preliminary draft rule does not refer to the State TAC list, but rather the list that is regulated under the Air District's *Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants*. The Rule 2-5 list of TACs includes those State TACs that have a basis for the evaluation of health effects under guideline procedures adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA), and several additional substances that are not State TACs but that are regulated under the State's Air Toxics Hot Spots Program. The Rule 2-5 list is used because it is believed to cover the TACs that are of most relevance in terms of health risks, and that as such warrant consideration in the new rule. If health effects values for additional TACs are adopted by OEHHA over time, these will be added to Air District Rule 2-5 by amendment, and therefore also become covered by the Petroleum Refining Emissions Tracking rule.

Air District staff is aware that, unlike criteria pollutants and TACs, GHGs are not directly associated with localized or regional health risks, which is the primary issue that the new rule is intended to address. GHGs were included in the preliminary draft rule because of climate change issues (which have a link to increasing air concentrations of ozone, a criteria pollutant that forms on hot summer days), and because measures to reduce GHG emissions typically result in co-benefits in terms of reducing criteria pollutant and TAC emissions. Air District staff is interested in receiving input on whether the new rule should cover emissions of GHGs as proposed, or focus instead on the other two categories of regulated air pollutants.

Odorous and visible emissions are not specifically proposed to be covered by the new rule, although most of these pollutants are also included in one of the categories of regulated air pollutants that would be covered (e.g., hydrogen sulfide, which is the primary odorous compound emitted from refineries, is a covered TAC; visible emissions are typically fine particulate matter (PM_{2.5}), a covered criteria pollutant).

C. Source Coverage

Air District staff believes that the new Petroleum Refining Emissions Tracking rule should apply to all air emissions from "stationary sources" at petroleum refineries. Stationary sources, as opposed to mobile sources such as trucks and other vehicles, are the sources over which the Air District has regulatory jurisdiction. Several definitions in the preliminary draft rule are intended to clarify source coverage. This includes the definition of "petroleum refinery" in Section 12-15-219, the definition of "source" in Section 12-15-226 (which is the same definition used in the Air District's permit rule), and the definition of "emissions inventory" in Section 12-15-214.

Air District staff also believes that the new rule should apply to petroleum refinery operations whether or not these operations are owned or operated by different entities. For example, some Bay Area refineries include co-located hydrogen plants that are owned or operated by separate companies, but that provide hydrogen for refinery operations. Similar arrangements also exist for refinery terminal operations, and auxiliary facilities (e.g., cogeneration plants). The definition of “refinery owner/operator” provided in Section 12-15-224 of the preliminary draft rule indicates that the refinery owner/operator is responsible for the submittal of required reports and plans that cover the entire refinery, including those that may be separately owned or operated. This is the same approach that is used in the implementation of Air District *Regulation 12, Rule 12: Flares at Petroleum Refineries* (e.g., for the submittal of Flare Minimization Plans).

D. Time Period for Determining Emission Changes

The approach proposed for the new Petroleum Refining Emissions Tracking rule is to track actual air emissions from each refinery over time to determine whether emission reduction plans should be prepared and implemented. This will necessitate the determination of the quantity of air emissions occurring from the refinery (i.e., an “emissions inventory”) for both a “baseline” (i.e., existing) period, and “on-going” (i.e., future) periods.

Air District staff believes that the most appropriate time period over which to establish baseline and on-going emissions inventories is a calendar year. This approach would be consistent with existing emissions inventory requirements that apply to the refineries (e.g., Air District annual update questionnaires, California Air Resources Board (CARB) and U.S. Environmental Protection Agency (EPA) GHG emissions reporting, and U.S. EPA Toxics Release Inventory). The use of annual periods for determining emissions changes is also consistent with procedures for determining major modifications under New Source Review permitting programs.

E. Emissions Inventory Methodology

Emissions inventories are used in a variety of air quality programs, and methodologies for establishing these inventories are provided in various publications. Depending on the specific type of source, and the specific type of air pollutant emitted, “state-of-the-art” emissions inventory techniques may involve continuous emission monitors, source-specific emission tests, general emission factors (i.e., representative values that relate the quantity of a pollutant emitted with an activity associated with the release of that pollutant), material balances, or empirical formulae. The term “emissions inventory” is defined in Section 12-15-214 of the preliminary draft rule.

Due to the diversity of emissions inventory methodologies that exist, and the need to update these methodologies on an on-going basis due to improvements in scientific understanding and available data, Air District staff does not believe that the new rule should include detailed emissions inventory methodologies. Rather, it is proposed that

Air District staff publish, and periodically update, emissions inventory guidelines for petroleum refineries that specify the methodology to be used for establishing baseline and on-going emissions inventories required under the rule. This provision is provided in Section 12-15-410 of the preliminary draft rule. Section 12-15-601 indicates that emissions inventories submitted under the rule must be prepared following the Air District-published guidelines.

The initial refinery emissions inventory guideline document will be developed concurrently with the development of the new rule. It is expected that this document will refer heavily to other inventory methodology publications, including the refinery emissions protocol issued for the purpose of improving emissions inventories as collected through the U.S. EPA's 2011 Information Collection Request (ICR) for the petroleum refining industry (*Emission Estimation Protocol for Petroleum Refineries*, Version 2.1.1, Final ICR Version, RTI International, May 2011).

The Air District has used staff-published guideline documents in combination with other rules that have requirements based on detailed technical information that needs to be updated on an on-going basis. This includes the Air District's BACT/TBACT Workbook and Permit Handbook (both used in Air District Rules 2-2 and 2-5), and Health Risk Screening Guidelines (used in Air District Rules 2-1 and 2-5).

F. Establishing Baseline Emissions Inventories

The establishment of existing annual baseline emissions inventories will provide the basis in the new rule for determining emissions changes that occur from each refinery over time and whether emission reduction plans will be required. Each refinery would be required to prepare and submit a refinery baseline emissions inventory report to the Air District as specified in Section 12-15-401 of the preliminary draft rule.

Although refinery operations are more continuous and uniform than some other types of industries, year-to-year variations in emissions occur due to a variety of factors. Some of these factors include business cycles that affect the demand for products produced, and cyclical process unit maintenance turnarounds (which generally occur on different schedules at different refineries). The intent of the Petroleum Refining Emissions Tracking rule is not to trigger mitigation requirements based on changes in emissions that occur due to these cyclical factors.

A variety of other factors may affect variations in year-to-year emissions from a refinery including the addition of additional emissions controls, equipment changes (e.g., replacements, modernizations, and expansions), accidents, compliance issues, changes in feed stocks used, and the mix of products produced due to business decisions. Air District staff believes that emission changes due to all of these other factors should be considered in establishing whether or not mitigation is required under the new rule.

Many potential approaches exist for establishing baseline emission inventories in the new rule. As is specified in Sections 12-15-206 and 221 of the preliminary draft rule, Air District staff is proposing the following approach:

- (1) Allow each refinery to choose a calendar year baseline period within the 10-year timeframe Jan. 1, 2004 through Dec. 31, 2013. This look-back period was chosen because: (a) it includes four years that precedes the 2008 recession, which impacted business activity for refineries and many other industries, (b) detailed flare monitoring requirements were in effect for all of these years under Air District *Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries*, and (c) it is consistent with procedures for determining baseline emissions for the purpose of determining major modifications under New Source Review permitting programs.
- (2) Adjust baseline emissions inventories as follows: (a) exclude emissions that exceeded regulatory or permitted limits, (b) exclude emissions resulting from accidents required to be reported in a Risk Management Plan (RMP) under 40 CFR 68.168, and (c) require that baseline emissions for each source be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the source must comply on or before July 1, 2014, had such source been required to comply with such limitation during the baseline period. The first two exclusions are intended to disallow a refinery from receiving “credit” for excessive emissions occurring during the baseline period. The third provision is a way to adjust for current regulatory requirements that may not have been in effect during the entire 10-year look-back period. The proposed baseline emissions inventory adjustments are consistent with those used in establishing baseline emissions for the purpose of determining major modifications under New Source Review permitting programs.

G. Establishing On-going Emissions Inventories

After refinery baseline emissions inventories are established under the new Petroleum Refining Emissions Tracking rule, each refinery would be required to prepare and submit to the Air District refinery on-going emissions inventory reports for each subsequent calendar year as specified in Section 12-15-402 of the preliminary draft rule. In addition to specifying the quantity of emissions that occurred from the refinery during the year for which the report is prepared, the on-going emissions inventory reports would also identify the changes in emissions that occurred relative to the baseline emissions inventory, and indicate whether any observed increase in emissions exceeded specified “trigger-levels” (see Section I of this report).

H. Revising Baseline Emissions Inventories

After being initially established, it is important that baseline emissions inventories be revised to reflect any updated emissions inventory methodologies that are used in on-going emissions inventories, to the extent that such improved methodologies are also applicable to the sources included in the baseline emissions inventory. This will ensure that a uniform basis exists for determining changes in emissions over time. This

provision is specified in Section 12-15-403 of the preliminary draft rule. Any such revisions to a baseline emissions inventory report would need to be made no later than the submittal deadline of the on-going emissions inventory report that contains the updated methodology. This provision would also cover potential expansions of the emissions inventory over time to address additional compounds that may be added to the Air District Rule 2-5 TAC list.

I. Trigger-Levels

The approach proposed for the new Petroleum Refining Emissions Tracking rule is to require emission reduction plans for observed emission increases at a refinery that are large enough to warrant such action. In the preliminary draft rule, these emission increases are designated as “trigger-levels” (defined in Section 12-15-228). Any observed emission increases that exceed trigger-levels would have to be identified in an on-going emissions inventory report as specified in Section 12-15-402.6 of the preliminary draft rule.

For criteria pollutants, the proposed trigger-levels address both regional and local air quality impacts. Trigger-levels for regional impacts are based on whether emission increases exceed specified quantities. These trigger-levels are set for those air pollutants, and their atmospheric precursors, for which the region has a “non-attainment” designation for an Ambient Air Quality Standard (AAQS). Precursor organic compounds (POC) and oxides of nitrogen (NO_x), which are precursors to the formation of the non-attainment pollutants ozone, PM_{2.5}, and PM₁₀, would have trigger-levels of 10 tons per year, as would sulfur dioxide (SO₂), which is a precursor to the formation of PM_{2.5} and PM₁₀. Directly emitted PM_{2.5} would also have a trigger-level of 10 tons per year, and directly emitted PM₁₀ (which has less serious health effects than PM_{2.5}) would have a trigger-level of 15 tons per year.

The approach for determining whether emission increases of specified criteria pollutants and TACs are large enough to warrant the preparation of emission reduction plans based on localized impacts is more complex, and requires the use of an air dispersion model. The air dispersion model is used to translate the quantity of pollutants emissions into estimates of air concentrations at various locations outside the boundaries of the refinery. Such a modeling demonstration would need to be completed in accordance with Section 12-15-407 of the preliminary draft rule.

For CO, a criteria pollutant for which the region has an “attainment” designation, a two tier approach would be used to determine trigger-levels: (1) emissions increases up to 100 tons per year would be assumed to be less than trigger-levels (note that unhealthy levels of CO occur at much higher air concentrations relative to other criteria pollutants), (2) emission increases greater than 100 tons per year may be demonstrated to be less than trigger-levels based on an AAQS modeling demonstration. This modeling demonstration must show that overall CO air concentrations in the “ambient air” (see definition in Section 12-15-205), resulting from emissions from existing sources in addition to the increased emissions from the refinery, are within applicable AAQS (i.e., 9.0 ppm for an 8-hour average, and 20.0 ppm for a 1-hour average).

For PM_{2.5} and TACs, the determination of whether an emission increase exceeds trigger-levels would have both an incremental and cumulative impacts analysis component. In both cases, air dispersion modeling results would be established at “sensitive receptor” (see definition in Section 12-15-225) locations in the surrounding community. For PM_{2.5}, the incremental impacts analysis would evaluate whether the increase in PM_{2.5} emissions at the refinery would increase PM_{2.5} concentrations at a sensitive receptor by more than 0.3 micrograms per cubic meter (annual average). The cumulative impacts analysis would evaluate whether all PM_{2.5} emissions from the refinery, and all other sources of PM_{2.5} emissions located within 1000 feet of the refinery’s property line, would result in PM_{2.5} concentrations at a sensitive receptor of more than 0.8 micrograms per cubic meter (annual average).

For TACs, the determination of whether an increase in emissions exceeds trigger-levels would be similar in approach to that of PM_{2.5}, but would have the additional step of calculating health risks from air dispersion modeling results. The health risk calculation methodology would be based on guidelines adopted by Cal/EPA’s OEHHA for the Air Toxics Hot Spots Program. For TACs, the incremental impacts analysis would evaluate whether the increase in TAC emissions at the refinery would increase cancer risk (see definition in Section 12-15-207) by more than 10 in a million, or increase non-cancer risk (chronic and acute, see definitions in Sections 12-15-202 and 208) by more than a Hazard Index of 1.0, at a sensitive receptor. The cumulative impacts analysis would evaluate whether all TAC emissions from the refinery, and all other sources of TAC emissions located within 1000 feet of the refinery’s property line, would result in a cancer risk that exceeds 100 in a million, or a non-cancer risk (chronic and acute) that exceeds a Hazard Index of 10.0, at a sensitive receptor.

Stakeholders that are interested in additional information regarding the basis for the proposed “trigger-levels” may wish to refer to the Air District’s *Revised Draft Options and Justification Report: California Environmental Quality Act Thresholds of Significance, October 2009*.¹

J. Emission Reduction Plans

The proposed new Petroleum Refining Emissions Tracking rule would require the refinery owner/operator to prepare and submit to the Air District an emission reduction plan if an emission increase from the refinery exceeds trigger-levels. The provision to submit emission reduction plans is provided in Section 12-15-405 of the preliminary draft rule.

The first required element of an emission reduction plan would be a causal analysis. The causal analysis would need to identify the source (or sources) of emissions at the refinery that caused or contributed to the observed emission increase that exceeded

¹ Note that, pending the outcome of on-going litigation, the Air District is not recommending that the trigger-levels provided in this document be used as a generally applicable measure of a project’s significant air quality impacts under the California Air Quality Act (CEQA).

trigger-levels, and the factor (or factors) that resulted in the increase. Among the potential factors that could cause an emission increase, each causal analysis would need to address the degree to which changes in crude slates may have caused or contributed to the increase. Records of crude slate composition would need to be provided to support this aspect of the causal analysis.

The next required element of an emission reduction plan is the identification of potential air emission reduction measures. The term “air emission reduction measures” is defined broadly (see definition in Section 12-15-204 of the preliminary draft rule), and includes equipment or techniques intended to reduce or eliminate air emissions from a source, and that may include equipment upgrades or modernization, improved emissions capture or control, process changes, operational changes, or feedstock modifications. The refinery owner/operator would be given the opportunity to identify specific on-site air emission reduction measures that the facility is committed to implement and that would reduce the observed emissions increase to less than trigger-levels within a period of two years.

If the refinery owner/operator fails to identify air emission reduction measures sufficient to reduce emission increases to less than trigger-levels within a period of two years, the refinery owner/operator would be required to conduct a refinery emission reduction audit (see definition in Section 12-15-222 of the preliminary draft rule). This audit would be a comprehensive evaluation of the opportunities for implementing air emission reductions measures at the refinery for the air pollutant(s) with an emission increase that exceeds trigger-levels. All such measures that the audit determines are feasible would need to be included in the emission reduction plan. The term “feasible” would be defined as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.” Note that this definition is identical to that provided in Section 12-12-202 of the Air District’s “Flare Control Rule” which establishes requirements for measures designed to prevent flaring at refineries. The rationale for rejecting potential air emissions reduction measures as infeasible would need to be provided in the audit report. The refinery owner/operator would be required to include in their emission reduction plan a schedule for the expeditious implementation of all feasible air emission reduction measures at the refinery.

After the Air District approves an emission reduction plan, the refinery owner/operator would be required to implement any identified air emission reduction measures in accordance with the schedule provided in that plan (see Section 12-15-301 of the preliminary draft rule). To fail to do so would constitute a violation of this standard of the rule. After an emission reduction plan is in place, the refinery owner/operator would also be required to continue to track emissions from the refinery and submit on-going emissions inventory reports on an annual basis. If a subsequent refinery on-going emissions inventory report indicates that an emission increase that exceeds trigger-levels continues to exist, the existing emission reduction plan would need to be updated. The emission reduction plan update would need to address the status of air emission reduction measures included in the existing plan. In addition, if the existing emission reduction plan failed to reduce emission increases to less than trigger-levels

within two years as the plan specified (under Section 12-15-405.2), the updated plan would need to include a refinery emission reduction audit. If the existing emission reduction plan had included a refinery emission reduction audit (under Section 12-15-405.3), the updated emission reduction plan would need to include an updated refinery emission reduction audit that considers the feasibility of refinery air emission reduction measures based on any changes that may have occurred in economic, environmental, legal, social and technological factors.

The preliminary draft Petroleum Refining Emissions Tracking rule would limit consideration of air emission reduction measures in emission reduction plans to on-site sources at the refinery. Air District staff is interested in receiving input on whether the new rule should also allow for consideration of off-site air emission reduction measures. This would seem to be most appropriate for the reduction of observed increases in GHG emissions, since these pollutants do not have direct localized impacts and are relevant on a much larger spatial-scale than criteria pollutants and TACs. One option might be to allow an “off-ramp” in the rule for emission reduction plan updates, after an initial refinery emission reduction audit had been completed for GHGs, provided that additional off-site air emission reduction measures were committed to be implemented on an expeditious schedule.

K. Air Monitoring

The proposed new Petroleum Refining Emissions Tracking rule would require the refinery owner/operator to prepare and submit to the Air District an air monitoring plan for establishing and operating a fence-line monitoring system and a community air monitoring system (see Section 12-15-408). The terms “fence-line monitoring system” and “community air monitoring system” are defined in the preliminary draft rule in Sections 12-15-216 and 210, respectively. The air monitoring plans would need to be prepared in accordance with air monitoring guidelines that are published by the Air District (see Sections 12-15-411 and 602).

The initial air monitoring guideline document will be developed concurrently with the development of the proposed rule. Much of the information gathering for the guideline document is being completed under Action Item 3 of the Air District’s *Work Plan for Action Items Related to Accidental Releases from Industrial Facilities*. Under this Action Item, Air District staff has retained a contractor to create a report that identifies equipment and methodological options for monitoring systems. A panel of monitoring experts gathered from academia, industry, the community, and other government agencies will then discuss and weigh the various options and provide input to guide the Air District in developing the air monitoring guidelines.

Within one year of Air District approval of a refinery’s air monitoring plan, the refinery owner/operator would be required to ensure that fence-line monitoring systems and community air monitoring systems are installed, operated, and maintained, in accordance with the approved plan (see Sections 12-15-501 and 502 of the preliminary draft rule).

The Air District would update the initial air monitoring guideline document within a five year period of the publication of the initial guideline document. The guidelines would be updated in consideration of advances in monitoring technology, updated information regarding the health effects of air pollutants, and review of data collected by existing monitoring systems required under the rule. The refinery owner/operator would be required to implement any needed modifications to existing monitoring systems within one year of publication of the updated guidelines.

6. COST RECOVERY

The Air District has the authority to assess fees to regulated entities for the purpose of recovering the reasonable costs of implementing and enforcing applicable regulatory requirements. On March 7, 2012, the Air District's Board of Directors adopted a Cost Recovery Policy that specifies that newly adopted regulatory measures should include fees that are designed to recover increased regulatory program activity costs associated with the measure (unless the Board of Directors determines that a portion of those costs should be covered by tax revenue).

In accordance with the adopted Cost Recovery Policy, Air District staff intends on developing a new fee schedule concurrent with the development of the new Petroleum Refining Emissions Tracking rule. Staff has begun to develop a preliminary draft fee schedule for this purpose, and expects to make this available to stakeholders for review and comment prior to July 1, 2013.



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APPENDIX A

BACKGROUND INFORMATION

1. Bay Area Petroleum Refineries

There are currently five petroleum refineries that are located in the Bay Area within the jurisdiction of the Air District: (1) Chevron Products Company (Richmond), (2) Phillips 66 Company – San Francisco Refinery (Rodeo), (3) Shell Martinez Refinery (Martinez), (4) Tesoro Refining and Marketing Company (Martinez), and (5) Valero Refining Company – California (Benicia).

2. Petroleum Refining Processes

Petroleum refineries are complex facilities that convert crude oil into a wide variety of refined products, including gasoline, aviation fuel, diesel fuel and other fuel oils, lubricating oils, and feed stocks for the petrochemical industry. Refineries consist of the following general processes and associated operations.

a) Separation Processes

Crude oil consists of a complex mixture of hydrocarbon compounds with small amounts of impurities including sulfur, nitrogen, and metals. The first phase in petroleum refining is the separation of crude oil into its major constituents using distillation and “light ends” recovery (i.e., gas processing) that split crude oil constituents into component parts known as “boiling-point fractions”.

b) Conversion Processes

To meet the demands for high-octane gasoline, jet fuel, and diesel fuel, components such as residual oils, fuel oils, and light ends are converted to gasoline and other light fractions. Cracking, coking, and visbreaking processes are used to break large petroleum molecules into smaller ones. Polymerization and alkylation processes are used to combine small petroleum molecules into larger ones. Isomerization and reforming processes are applied to rearrange the structure of petroleum molecules to produce higher-value molecules of a similar size.

c) Treating Processes

Petroleum treating processes stabilize and upgrade petroleum products by separating them from less desirable products, and by removing objectionable elements. Treating processes, employed primarily for the separation of petroleum products, include such processes as deasphalting. Undesirable elements such as sulfur, nitrogen, and oxygen are removed by hydrodesulfurization, hydrotreating, chemical sweetening, and acid gas removal.

d) Feedstock and Product Handling

Refinery feedstock and product handling operations consist of unloading, storage, blending, and loading activities.

e) Auxiliary Facilities

A wide assortment of processes and equipment not directly involved in the refining of crude oil is used in functions vital to the operation of the refinery. Examples are boilers, waste water treatment facilities, hydrogen plants, cooling towers, and sulfur recovery units. Products from auxiliary facilities (e.g., clean water, steam, and process heat) are required by most process units throughout the refinery.

3. Air Pollutants Emitted from Petroleum Refineries

Air pollutants are categorized based on their properties, and the programs in which they are regulated, as follows: (1) Criteria pollutants, (2) toxic air contaminants (which in federal programs are referred to as hazardous air pollutants), and (3) greenhouse gases. Additional categories of air contaminants include odorous compounds and visible emissions, although these are most often also components of one or more of the three primary categories of regulated air pollutants previously listed.

Criteria pollutants are contaminants for which Ambient Air Quality Standards (AAQS) have been set, or that are atmospheric precursors to such air pollutants (i.e., contaminants that are emitted into the air and that then participate in chemical reactions to form a criteria pollutant). The AAQS are air concentration-based standards that are set to protect public health and welfare. U.S. EPA sets AAQS on a national basis (National Ambient Air Quality Standards, or NAAQS), and CARB sets AAQS for use in the State of California (California Ambient Air Quality Standards, or CAAQS). Although there is some variation in the specific pollutants for which NAAQS and CAAQS have been set, the term "criteria pollutants" generally refers to the following: (1) Carbon monoxide (CO), (2) oxides of nitrogen (NO_x), (3) particulate matter (PM) in two size ranges -- diameter of 10 micrometers or less (PM₁₀), and diameter of 2.5 micrometers or less (PM_{2.5}), (4) precursor organic compounds (POC), and (5) sulfur dioxide (SO₂). Each of these criteria pollutants are emitted by petroleum refineries.

Toxic air contaminants (TACs) are contaminants for which AAQS have generally not been established, but that nonetheless may result in human health risks. TACs are generally emitted in much lower quantities than criteria pollutants, and may vary markedly in their relative toxicity (e.g., some TACs are millions of times more toxic than other TACs). The State list of TACs currently includes approximately 190 separate chemical compounds, and groups of compounds. TACs emitted from petroleum refineries include volatile organic TACs (e.g., acetaldehyde, benzene, 1,3-butadiene, formaldehyde, xylenes), semi-volatile and non-volatile organic TACs (e.g., benzo(a)pyrene, chlorinated dioxin/furans, cresols, and naphthalene), metallic TACs (e.g., compounds containing arsenic, cadmium, chromium, mercury, and nickel), and other inorganic TACs (e.g., chlorine, carbonyl sulfide, and hydrogen chloride).

Greenhouse gases (GHGs) are contaminants that absorb and emit thermal infrared radiation in the atmosphere and thereby contribute to climate change. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and three groups of fluorinated compounds

(i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)) are the major anthropogenic GHGs, and are regulated under the Kyoto Protocol international treaty, the federal Clean Air Act, and the California Global Warming Solutions Act. GHGs emitted from petroleum refineries include CO₂, CH₄ and N₂O.

4. Regulation of Air Pollutants from Petroleum Refineries

Air pollutant emissions from Bay Area petroleum refineries have been regulated for over 50 years, with most of the rules and regulations being adopted following enactment of the 1970 Clean Air Act amendments. The Air District has the primary responsibility to regulate “stationary sources” of air pollution in the Bay Area, and the Air District has adopted many rules and regulations that apply to petroleum refineries.

At the State level, the California Air Resources Board (CARB) has the primary responsibility to regulate vehicles and most other “mobile sources” of air pollution (e.g., ships, trucks, and mobile equipment) in California, and has adopted many rules and regulations that apply to those sources. CARB has also adopted State rules known as Airborne Toxic Control Measures (ATCMs) to reduce emissions of TACs from a variety of sources. ATCMs that apply to stationary sources are implemented and enforced by local air districts.

The U.S. Environmental Protection Agency (EPA) has adopted two types of stationary source rules that apply to petroleum refineries: (1) New Source Performance Standards (NSPS) to reduce criteria pollutants, and (2) National Emission Standards for Hazardous Air Pollutants (NESHAP) to reduce TACs. These EPA rules are implemented and enforced by the Air District in the Bay Area. In many cases, existing Air District or CARB rules are more stringent than these NSPS and NESHAP rules. U.S. EPA has also begun to adopt rules to reduce GHG emissions under the authority of the Clean Air Act, but relatively few of these rules currently exist (e.g., U.S. EPA has indicated that it is currently developing an NSPS to reduce GHG emissions from new and existing refineries).

More recently, CARB has adopted rules to reduce emissions of GHGs from mobile and stationary sources in California. Refineries are subject to CARB’s Cap-and-Trade Rule (*California Cap on Greenhouse Gas Emissions and Market-based Compliance Mechanisms*). The Cap-and-Trade Rule will reduce GHG emissions collectively from all subject sources using a market-based approach, although there is no requirement that any specific source reduce its emissions.

Petroleum refineries are also subject to regulatory programs that are intended to prevent accidental releases of substances. The primary programs of this type are based on requirements in the 1990 Clean Air Act amendments as follows: (1) the Process Safety Management (PSM) program, which focuses on protecting workers, and which is administered by the U.S. Occupational Safety & Health Administration (OSHA), and (2) the Accidental Release Prevention program (commonly referred to as the Risk Management Program, or RMP), which focuses on protecting the public and the

environment, and which is administered by U.S. EPA. Bay Area refineries are subject to Cal/OSHA's PSM program, which is very similar to the federal OSHA program, but with certain more stringent State provisions. Bay Area refineries are subject to the California Accidental Release Prevention (CalARP) Program, which is very similar to U.S. EPA's RMP program, but with certain more stringent State provisions. In addition, Contra Costa County and the City of Richmond have both adopted an Industrial Safety Ordinance (ISO). These ISO's are very similar to CalARP requirements, but with certain more stringent local provisions. Accidental release prevention programs in California are implemented and enforced by local Administering Agencies, which in the case of Bay Area refineries are Solano County (for the Valero Refining Company) and Contra Costa County (for the four other Bay Area refineries).

A partial list of the air pollution rules and regulations that the Air District implements and enforces at Bay Area refineries follows.

- Air District Regulation 1: General Provisions and Definitions
- Air District Regulation 2, Rule 1: Permits, General Requirements
- Air District Regulation 2, Rule 2: New Source Review
- Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants
- Air District Regulation 2, Rule 6: Major Facility Review (Title V)
- Air District Regulation 6, Rule 1: Particulate Matter, General Requirements
- Air District Regulation 8, Rule 5: Storage of Organic Liquids
- Air District Regulation 8, Rule 6: Terminals and Bulk Plants
- Air District Regulation 8, Rule 8: Wastewater (Oil-Water) Separators
- Air District Regulation 8, Rule 9: Vacuum Producing Systems
- Air District Regulation 8, Rule 10: Process Vessel Depressurization
- Air District Regulation 8, Rule 18: Equipment Leaks
- Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Air District Regulation 8, Rule 44: Marine Vessel Loading Terminals
- Air District Regulation 9, Rule 1: Sulfur Dioxide
- Air District Regulation 9, Rule 2: Hydrogen Sulfide
- Air District Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines
- Air District Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines
- Air District Regulation 9, Rule 10: Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries

- Air District Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries
- Air District Regulation 12, Rule 12: Flares at Petroleum Refineries
- 40 CFR Part 63, Subpart CC: Petroleum Refineries (NESHAP)
- 40 CFR Part 63, Subpart UUU: Petroleum Refineries: Catalytic Cracking, Catalytic Reforming, and Sulfur Plant Units (NESHAP)
- 40 CFR Part 61, Subpart FF: Benzene Waste Operations (NESHAP)
- 40 CFR Part 60, Subpart J: Standards of Performance for Petroleum Refineries (NSPS)
- State Airborne Toxic Control Measure for Stationary Compression Ignition (Diesel) Engines (ATCM)



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**BAAQMD REGULATION 12, RULE 15:
PETROLEUM REFINING EMISSIONS
TRACKING**

APPENDIX B

REGULATORY CONCEPT PAPER

Regulatory Concept Paper
Petroleum Refining Emissions Tracking Rule
Bay Area Air Quality Management District
Draft: October 15, 2012

Background

Petroleum refineries convert crude oil into a wide variety of refined products, including gasoline, aviation fuel, diesel and other fuel oils, lubricating oils, and feed stocks for the petrochemical industry. Crude oil consists of a complex mixture of hydrocarbon compounds with smaller amounts of impurities including sulfur, nitrogen, oxygen and metals (e.g., iron, copper, nickel, and vanadium). Crude oil that originates from different geographical locations may vary significantly with respect to its “quality”, as is most often determined by the oils’ density (light to heavy) and sulfur content (sweet to sour).

The industry standard measure for crude oil density is API gravity, which is expressed in units of degrees, and which is inversely related to density (i.e., a lower API gravity indicates higher density; a higher API gravity indicates lower density). “Light crude” generally refers to crude oil with API gravity of 38 degrees or more; “medium crude” has API gravity between 22 and 38 degrees; and “heavy crude” has API gravity of 22 degrees or less. “Sweet crude” is commonly defined as crude oil with a sulfur content of less than 0.5%, while “sour crude” has a sulfur content of greater than 0.5%.

“Light sweet crude” is the most sought-after type of crude oil as it contains a disproportionately large amount of the hydrocarbon fractions that are used in the more valuable refined products (e.g., gasoline, fuel oils, and aviation fuel). “Heavy sour crude” is significantly less expensive than “light sweet crude” because it contains a large amount of the hydrocarbon fractions heavier than diesel, is higher in sulfur content, and is therefore more difficult and expensive to turn into the more valuable refined products.

The quality of crude oil imports in the United States has steadily declined over the last several decades both in terms of density and sulfur content. Sour crudes also tend to be more corrosive than sweet crudes, and so there has also been an increase in the corrosiveness of imported crudes over time. The trend towards lower quality crudes is largely due to the refiners’ preference for quality crudes – this has led to the depletion of those reserves and reduced the market share of the light sweet crude that remains. These trends are expected to continue; some have estimated that worldwide production of heavy sour crudes will increase by about one-third by the year 2020.

Another issue that refiners have been faced with in recent years is increasingly more stringent regulatory standards for higher quality refined products. Both the U.S. EPA and the California Air Resources Board have adopted regulations that require refineries to significantly reduce the sulfur content of gasoline and diesel fuel, and other types of “reformulated fuel” standards have also been adopted.

Refiners have therefore had to confront two opposite forces – a crude supply that is of increasingly lower quality, and mandates that require high quality reformulated fuels. In

order to address these issues, refiners have responded in a variety of ways. One of the primary changes being made at virtually all refineries is to increase the amount of hydrotreating that occurs. Hydrotreating is the principle method for removing sulfur from crude oil, and it involves a chemical process in which hydrogen reacts with the sulfur to create hydrogen sulfide that can easily be removed from the oil. Other changes have included an increased reliance on processes that convert heavy oil into light products (e.g. coking). Increases in the corrosiveness of crude oil has been mitigated by the addition of compounds to neutralize the acid, while some refiners have chosen to upgrade their piping and unit materials to stainless steel. In some cases, low quality crude oil from the producing region is pre-processed to “upgrade” the oil to higher quality specifications before it is sent to the refinery (e.g., extra heavy oils, like those from the Orinoco region in Venezuela or the Alberta tar sands in Canada, are typically upgraded in a process that is both capital- and energy-intensive, but that yields a higher-quality “syncrude”).

The Congressional Research Service’s report for congress entitled “The U.S. Oil Refining Industry: Background in Changing Markets and Fuel Policies” (Nov. 22, 2010) summarizes the trend in crude oil quality, and the refiners responses, as follows:

“Over the last 25 years, the API gravity of imported crude oils has been decreasing while average sulfur content has been increasing. API gravity, a measure developed by the American Petroleum Institute, expresses the “lightness” or “heaviness” of crude oils on an inverted scale. With a diminishing supply of light sweet (low sulfur) crude oil, U.S. refiners have had to invest in multi-million dollar processing-upgrades to convert lower-priced heavier crude oils to high-value products such as gasoline, diesel, and jet fuel.” (Page 13)

Existing Regulatory Setting

Bay Area refineries are subject to various air quality rules that have been adopted by the Air District, CARB and U.S. EPA. These rules contain standards that are expressed in a variety of forms to ensure that emissions are effectively controlled including: (1) requiring the use of specific emission control strategies or equipment (e.g., the use of floating roof tanks for VOC emissions), (2) requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95% control of VOC emissions from pressure relief devices), (3) requiring that emissions from a source not exceed specific concentration levels (e.g., 100 ppm by volume of VOC for equipment leaks, unless those leaks are repaired within a specific timeframe; 250 ppm by volume SO₂ in exhaust gases from sulfur recovery units; 1000 ppm by volume in exhaust gases from catalytic cracking units), (4) requiring that emissions not exceed certain quantities for a given amount of material processed or fuel used at a source (e.g., 0.033 pounds NO_x per million BTU of heat input, on a refinery-wide basis, for boilers, process heaters, and steam generators), (5) requiring that emissions be controlled sufficient to not result in off property air concentrations above specified levels (e.g., 0.03 ppm by volume of H₂S in the ambient air), (6) requiring that emissions from a source not exceed specified opacity levels based on visible emissions observations (e.g., no more than 3 minutes in any hour in which emissions are as dark or darker than No. 1 on the Ringelmann chart), and (7) requiring that emissions be minimized by the use of all feasible prevention

measures (e.g., flaring prohibited unless it is in accordance with an approved Flare Minimization Plan). Air quality rules generally do not expressly limit mass emissions (e.g., pounds per year of any particular regulated air pollutant) from affected equipment unless that equipment was constructed or modified after March 7, 1979 and subject to the Air District's New Source Review (NSR) rule. All Bay Area refineries have "grandfathered" emission sources that were not subject to NSR, and so none of these facilities have overall mass emission limits that apply to the entire refinery. Nonetheless, mass emissions of relevant regulated air pollutants from Bay Area refineries are closely monitored, and these mass emissions have generally been substantially reduced over the past several decades.

Air Quality Issues

There have been concerns expressed about the air quality impacts that may result from the use of lower quality crude slates at refineries. The use of lower quality crude at refineries could potentially mean increased emissions of air contaminants such as sulfur containing pollutants from sulfur recovery facilities. Emissions could also increase as a result of accidents related to the increased corrosiveness of lower quality crudes. Processing lower quality crudes also requires more intense processing and higher energy requirements, which can result in increased air emissions. In order to address these issues, it has been suggested that: (1) limits should be set on the use of heavy, high sulfur, crude oil at refineries, (2) refineries should be required to replace old boilers, heaters, and other energy inefficient equipment with new equipment that utilizes the Best Available Control Technology to reduce air pollutants, and (3) refineries should be required to use clean renewable power instead of "grid electricity" or fossil-fuel based power produced onsite.

Others contend that existing regulatory programs have resulted in significant emission reductions at refineries over the last decades even as the quality of crude oil inputs has been reduced. These regulatory programs would provide continued assurances that air emissions would not increase; or that any emission increases that might occur would not be significant in terms of health risks to the public. An increase in accidental releases due to the processing of more corrosive crudes can be prevented through the use of appropriate equipment, operating and maintenance procedures, and training requirements. Energy efficiency measures are already being implemented at refineries in response to the need to upgrade equipment to meet changing market conditions (in California, these now include market conditions resulting from the Cap-and-Trade program to reduce GHG emissions). Finally, the use of many types of renewable power (e.g., solar and wind) are impractical for refineries that must operate on a continuous basis.

Proposal for Addressing Air Quality Issues

The Air District would develop a rule that would apply to all five petroleum refineries in the Bay Area and that would track changes in the facility's air emissions. Any observed increases in air emissions at the facility above baseline levels would trigger: (1) a

requirement for an analysis of the cause of the emissions increase (which may include various factors such as increases in production levels or declining crude oil quality), and (2) a requirement for an assessment of local public health impacts in the surrounding community resulting from the emissions increase. Any significant increases in emissions, as determined based on the impacts analysis, would trigger a requirement for mitigation through the use of best management practices or other appropriate measures. Information associated with rule implementation would be made available to the public, and a process would be established whereby information of a “business confidential” nature would be protected.

Information on crude oil quality could be tracked in terms of its density, sulfur content, and perhaps using the results of other available chemical or physical analyses. Air emissions are already tracked at Bay Area refineries, but the specific methods used vary to some extent from one facility to another. Since emissions at a given facility may be impacted by events such as turnarounds and accidental releases that don’t occur every year, it may be appropriate that baseline and post-baseline emissions be established on a multi-year basis.

The proposed rule could incorporate elements similar to those utilized in Air District Regulation 12, Rule 12: Flares at Petroleum Refineries. Rule 12-12 requirements include: (1) flaring and associated emissions must be reported, (2) reports must be submitted as to the cause of flaring, and (3) Flare Minimization Plans (FMPs), which contain a variety of information about how flaring emissions have been, and will continue to be, minimized, must be prepared and updated on an annual basis. Information regarding flare activity and emissions are made available to the public, and FMPs are prepared and updated using a process that includes public review and comment, while providing a process to protect information that is considered business confidential. Rule 12-12 (and the related Air District Rule 12-11: Flare Monitoring at Petroleum Refineries) resulted in significant decreases in flaring activity and emissions at Bay Area refineries, and has served as a model for similar rules adopted by other agencies including U. S. EPA.

The proposed rule could also require that refineries establish more robust monitoring systems to detect emitted air pollutants along their facility boundaries and/or in nearby communities. Community-based air quality monitors could provide valuable data on public exposures to air pollutants emitted on a routine basis, and as a result of accidental releases.

Schedule

Air District staff could begin the rule development process in late 2012, with the goal of bringing a proposed Petroleum Refining Emissions Tracking Rule to the District’s Board of Directors for consideration of adoption in the first half of 2014.



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BAAQMD REGULATION 12, RULE 15: PETROLEUM REFINING EMISSIONS TRACKING

APPENDIX C

PRELIMINARY DRAFT RULE

**REGULATION 12
MISCELLANEOUS STANDARDS OF PERFORMANCE
RULE 15
PETROLEUM REFINING EMISSIONS TRACKING**

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REGULATION 12
MISCELLANEOUS STANDARDS OF PERFORMANCE
RULE 15
PETROLEUM REFINING EMISSIONS TRACKING

(Adopted [DATE])

12-15-100 GENERAL

12-15-101 Description: The purpose of this rule is to track air emissions from petroleum refineries over time, to identify the cause of, and mitigate, any significant emissions increases that occur, and to establish monitoring systems to provide detailed air quality data along refinery boundaries and in nearby communities.

12-15-200 DEFINITIONS

12-15-201 Accidental Air Release: An unanticipated emission of a criteria pollutant, toxic air contaminant, or greenhouse gas into the atmosphere.

12-15-202 Acute Hazard Index: A measure of short-term non-cancer health risks, which is the sum of the individual acute hazard quotients for toxic air contaminants identified as affecting the same target organ or organ system.

12-15-203 Acute Hazard Quotient: The ratio of the estimated short-term average concentration of a toxic air contaminant at a particular receptor location to its acute reference exposure level (estimated for inhalation exposure).

12-15-204 Air Emission Reduction Measures: Equipment or techniques intended to reduce or eliminate air emissions from a source, and that may include equipment upgrades or modernization, improved emissions capture or control, process changes, operational changes, or feedstock modifications.

12-15-205 Ambient Air: The portion of the atmosphere external to buildings to which the general public has access.

12-15-206 Baseline Period: A period of one calendar year, from the year 2004 through the year 2013, that is selected by a refinery owner/operator for establishing a refinery baseline emissions inventory.

12-15-207 Cancer Risk: An estimate of the probability that an individual will develop cancer as a result of lifetime exposure to emitted carcinogens at a given receptor location, and considering, where appropriate, age sensitivity factors to account for inherent increased susceptibility to carcinogens during infancy and childhood.

12-15-208 Chronic Hazard Index: A measure of long-term non-cancer health risks, which is the sum of the individual chronic hazard quotients for toxic air contaminants identified as affecting the same target organ or organ system.

12-15-209 Chronic Hazard Quotient: The ratio of the estimated long-term average concentration of a toxic air contaminant at a particular receptor location to its chronic reference exposure level (estimated for inhalation and non-inhalation exposures).

12-15-210 Community Air Monitoring System: Equipment that measures and records air pollutant concentrations in the ambient air at or near sensitive receptor locations near a facility, and which may be useful for estimating associated pollutant exposures and health risks, and in determining trends in pollutant levels over time.

12-15-211 Criteria Pollutant: An air pollutant for which an ambient air quality standard has been established, or that is an atmospheric precursor to such an air pollutant. For the purposes of this rule, criteria pollutants are carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter with an aerodynamic diameter of 10 micrometers or less (PM₁₀), particulate matter with an aerodynamic diameter of 2.5 micrometers or less (PM_{2.5}), precursor organic compounds (POC), and sulfur dioxide (SO₂).

12-15-212 Crude Oil: Petroleum, as it occurs after being extracted from geologic formations by an oil well, and after extraneous substances may have been removed, and which may be

- subsequently processed at a petroleum refinery.
- 12-15-213 Crude Slate:** A record of the types and quantities of crude oil processed by a particular petroleum refinery over a period of time.
- 12-15-214 Emissions Inventory:** A comprehensive accounting of the types and quantities of criteria pollutants, toxic air contaminants, and greenhouse gases that are released into the atmosphere based on state-of-the-art measurement technologies and estimation methodologies. For the purposes of this rule, emissions inventory data shall be collected or calculated for all continuous, intermittent, predictable, and accidental air releases from stationary sources at a petroleum refinery.
- 12-15-215 Feasible:** Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.
- 12-15-216 Fence-line Monitoring System:** Equipment that measures and records air pollutant concentrations along the property boundary of a facility, and which may be useful for detecting and estimating the quantity of fugitive emissions, gas leaks, and other air emissions from the facility.
- 12-15-217 Greenhouse Gases (GHGs):** The air pollutant that is defined in 40 C.F.R. Section 86.1818-12(a), which is a single air pollutant made up of a combination of the following six constituents: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. GHG emissions shall be expressed as CO₂ equivalent emissions (CO₂e) according to the methodology set forth in 40 C.F.R. Section 52.21(b)(49)(ii).
- 12-15-218 Health Risk:** The potential for adverse human health effects resulting from exposure to emissions of air contaminants and ranging from relatively mild temporary conditions, such as eye or throat irritation, shortness of breath, or headaches, to permanent and serious conditions, such as birth defects, cancer or damage to lungs, nerves, liver, heart, or other organs. Measures of health risk from exposure to toxic air contaminants include cancer risk, chronic hazard index, and acute hazard index.
- 12-15-219 Petroleum Refinery (Refinery):** An establishment that processes crude oil to produce more usable products such as gasoline, diesel fuel, aviation fuel, lubricating oils, asphalt or petrochemical feedstocks. Petroleum refinery processes include separation processes (e.g., atmospheric or vacuum distillation, and light ends recovery), petroleum conversion processes (e.g., cracking, reforming alkylation, polymerization, isomerization, coking, and visbreaking) petroleum treating processes (e.g., hydrodesulfurization, hydrotreating, chemical sweetening, acid gas removal, and deasphalting), feedstock and product handling (e.g., storage, blending, loading, and unloading), and auxiliary facilities (e.g., boilers, waste water treatment, hydrogen production, sulfur recovery plant, cooling towers, blowdown systems, compressor engines, and power plants).
- 12-15-220 Receptor Location:** A location outside the property boundary of the facility being evaluated where a member of the public may reasonably be expected to be exposed to air pollutants for the particular acute or chronic health risks being evaluated.
- 12-15-221 Refinery Baseline Emissions Inventory:** An emissions inventory for the baseline period that is used as a reference with which to compare emissions inventories for later periods of time (on-going emissions inventories) in order to determine changes in emissions that have occurred from a petroleum refinery. A refinery baseline emissions inventory shall not include emissions that exceeded regulatory or permitted limits, or emissions resulting from accidents required to be reported in a Risk Management Plan (RMP) under 40 CFR 68.168. In addition, baseline emissions for each source shall be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the source must comply on or before July 1, 2014, had such source been required to comply with such limitation during the baseline period.
- 12-15-222 Refinery Emission Reduction Audit:** An evaluation of the opportunities for implementing air emission reduction measures at sources of air pollution at a petroleum refinery, and the identification of all such feasible measures. A refinery emission reduction audit report shall identify all potential air emission reduction measures considered, and document the rationale for rejecting any measures that are identified as infeasible, including those that are rejected on the basis of being too costly.
- 12-15-223 Refinery On-going Emissions Inventory:** An emissions inventory at a petroleum refinery

covering a period of time occurring after the baseline period. For the purposes of this rule, on-going emissions inventories are required to be prepared for the calendar year 2014, and for each subsequent calendar year.

- 12-15-224 Refinery Owner/Operator:** Any person who owns, operates, or controls a petroleum refinery and that possesses sufficient authority to take the actions required to comply with this rule. The refinery owner/operator is responsible for submittal of reports and plans required by this rule that cover the entire petroleum refinery, including any refinery processes or auxiliary facilities that may be separately owned or operated.
- 12-15-225 Sensitive Receptor:** A receptor location where an individual that may have increased vulnerability to exposure to air pollutants may be present. For the purposes of this rule, sensitive receptors are residences (where an individual may live for 6 months or more out of a year), schools (including colleges and universities), daycares, hospitals, and senior-care facilities.
- 12-15-226 Source:** Any article, machine, equipment, operation, contrivance or related groupings of such which may produce and/or emit air pollutants.
- 12-15-227 Toxic Air Contaminant (TAC):** An air pollutant that may cause or contribute to an increase in mortality or in serious illness or that may pose a present or potential hazard to human health. For the purposes of this rule, TACs consist of the substances listed in Regulation 2, Rule 5, Table 2-5-1.
- 12-15-228 Trigger-Levels:** An increase in air emissions from a petroleum refinery relative to the baseline period that, if exceeded, initiates requirements under this rule to prepare or update an emission reduction plan. For the purposes of this rule, trigger-levels are as follows:
- 228.1:** Criteria pollutants: 10 tons per year of POC, NO_x, or SO₂; 15 tons per year of PM₁₀; 10 tons per year of PM_{2.5}, or a lesser amount that would increase PM_{2.5} air concentrations at a sensitive receptor by more than 0.3 micrograms per cubic meter (annual average) or that, when considered cumulatively with all sources of PM_{2.5} at the refinery and all other sources located within 1000 feet of the refinery's property line, would result in PM_{2.5} air concentrations at a sensitive receptor of more than 0.8 micrograms per cubic meter (annual average); 100 tons per year of CO, or a greater amount if the local CO concentrations in the ambient air from the refinery and all other emission sources would not exceed 9.0 ppm (8-hour average) and 20.0 ppm (1-hour average).
- 228.2:** Toxic Air Contaminants: The quantity of TAC emissions that would increase cancer risk at a sensitive receptor by more than 10 in a million, or non-cancer risk (chronic and acute) at a sensitive receptor by more than a Hazard Index of 1.0, or a lesser amount that, when considered cumulatively with all sources of TACs at the refinery and all other sources located within 1000 feet of the refinery's property line, would result in a cancer risk at a sensitive receptor that exceeds 100 in a million or a non-cancer risk (chronic) at a sensitive receptor that exceeds a Hazard Index of 10.0.
- 228.3:** Greenhouse Gases: 10 tons per year of GHGs.

12-15-300 STANDARDS

- 12-15-301 Emission Reduction Plan Implementation:** A refinery owner/operator shall implement any air emission reduction measures identified in an approved emission reduction plan prepared under Sections 12-15-405.2, 405.3, or 405.4 in accordance with the schedule provided in that plan.

12-15-400 ADMINISTRATIVE REQUIREMENTS

- 12-15-401 Refinery Baseline Emissions Inventory Report:** On or before December 31, 2014, a refinery owner/operator shall submit to the APCO a refinery baseline emissions inventory report in an APCO-approved format. This report shall include, at a minimum, the following:
- 401.1** Identification of the baseline period.
- 401.2** A summary of the total quantity of each criteria pollutant, TAC, and GHG that was

emitted from the petroleum refinery during the baseline period, excluding any emissions that do not meet the definition of Refinery Baseline Emissions Inventory in Section 12-15-221.

401.3 A detailed listing of the annual emissions of each criteria pollutant, TAC, and GHG emitted from each source at the petroleum refinery during the baseline period, and a complete description of the methodology used for determining these emissions including documentation of the basis for any assumptions used and the exclusion of any emissions that do not meet the definition of Refinery Baseline Emissions Inventory in Section 12-15-221. Emissions resulting from accidental releases shall be identified as such, along with the date(s) and times(s) that the release occurred.

401.4 A plot plan that clearly identifies the location of each source identified in Section 12-15-401.3 within the petroleum refinery.

12-15-402 Refinery On-going Emissions Inventory Reports: On or before July 1, 2015, and every subsequent July 1, a refinery owner/operator shall submit to the APCO an on-going emissions inventory report covering the previous calendar year period in an APCO-approved format. This report shall include, at a minimum, the following:

402.1 Identification of the calendar year that the refinery on-going emissions inventory report covers.

402.2 A summary of the total quantity of each criteria pollutant, TAC, and GHG that was emitted from the petroleum refinery during the on-going emissions inventory period.

402.3 A detailed listing of the annual emissions of each criteria pollutant, TAC, and GHG emitted from each source at the petroleum refinery, and a complete description of the methodology used for determining these emissions including documentation of the basis for any assumptions used, except that methodologies that are unchanged from what is described in the baseline emissions inventory report may instead be noted as such. Emissions resulting from accidental releases shall be identified as such, along with the date(s) that the release occurred.

402.4 A plot plan that clearly identifies the location of each source identified in Section 12-15-402.3 within the petroleum refinery.

402.5 A table that shows, on a refinery-wide basis for each applicable air pollutant, the change in emissions that occurred between the baseline period and the period for which the on-going emissions inventory report was prepared under this Section.

402.6 For each air pollutant for which an increase in emissions has been identified under Section 12-15-402.5, identification of whether the increase exceeds applicable trigger-levels. Emission increases of PM_{2.5}, TACs, and CO (greater than 100 tons per year) shall be identified as exceeding trigger-levels unless the refinery owner/operator includes in the report a modeling demonstration completed in accordance with Section 12-15-407.

12-15-403 Revision of Baseline Emissions Inventory Report: Any improvements in emissions inventory methodologies that are used to expand or refine refinery on-going emissions inventory reports submitted under Section 12-15-402 shall also be used to expand or refine the refinery baseline emissions inventory, to the extent that such improved methodologies are also applicable to the sources included in the baseline emissions inventory. In such instances, a revised refinery baseline emissions inventory report shall be submitted to the APCO no later than by the date the applicable on-going emissions inventory report is due. The revised refinery baseline emissions inventory report shall, at a minimum, identify the date of the revision, contain the information described in Sections 12-15-401.1 to 401.4, and clearly identify, describe, and justify the changes in the refinery baseline emissions inventory report that have been made.

12-15-404 Review and Approval of Refinery Emissions Inventory Reports: The procedure for determining whether a refinery baseline emissions inventory report submitted under Section 12-15-401 or 403, and a refinery on-going emissions inventory report submitted under Section 12-15-402, meet the applicable requirements of this rule is as follows:

404.1 Preliminary Review: Within 45 days of receipt of the emissions inventory report, the APCO will complete a preliminary review of the report to identify any deficiencies that need to be corrected. If the APCO determines that the submitted emissions

inventory report is deficient, the APCO will notify the refinery owner/operator in writing. The notification will specify the basis for this determination and the required corrective action.

404.2 Corrective Action: Upon receipt of such notification, the refinery owner/operator shall correct the identified deficiencies and resubmit the emissions inventory report within 45 days. If the APCO determines that the refinery owner/operator failed to correct any deficiency identified in the notification, the APCO will disapprove the emissions inventory report, or the APCO may make the necessary corrections to the emissions inventory report with a designation that the inventory report includes Air District revisions.

404.3 Public Comment: The emissions inventory report, including any revisions made to correct deficiencies will be made available for public review for at least 45 days (with the exception of information designated confidential). The APCO will consider any written comments received during this period prior to approving or disapproving the final emissions inventory report.

404.4 Final Action: Within 45 days of the close of the public comment period under Section 12-15-404.3, the APCO will approve the emissions inventory report if the APCO determines that the emissions inventory report meets the requirements of Sections 12-15-401, 402, or 403, and Section 12-15-601, and shall provide written notification to the refinery owner/operator. This period may be extended if necessary as determined by the APCO. If the APCO determines that the emissions inventory does not meet the requirements of Sections 12-15-401, 402, 403, and Section 12-15-601, the APCO will notify the refinery owner/operator in writing. The notification will specify the basis for this determination. Upon receipt of such notification, the refinery owner/operator shall correct the identified deficiencies and resubmit the emissions inventory report within 45 days. If the APCO determines that the refinery owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the refinery owner/operator has failed to meet the requirements of Sections 12-15-401, 402, or 403, and Section 12-15-601, and will disapprove the report, or the APCO may make the necessary corrections and approve the report with a designation that the report was approved with Air District revisions.

404.5 Public Inspection: Within 15 days of the approval or disapproval of an emissions inventory report under Section 12-15-404.4, the APCO shall post the approved or disapproved emissions inventory report on the District's website, and shall notify any member of the public who submitted comments under Section 12-15-404.3, or who otherwise requested such notification of this action in writing. In making information available for public inspection, the confidentiality of trade secrets, as designated by the refinery owner/operator, shall be handled in accordance with the District's procedures for handling requests for documents containing trade secrets.

12-15-405 Emission Reduction Plans: A refinery owner/operator shall submit to the APCO an emission reduction plan, or an update to an emission reduction plan that has been previously approved and that is not fully implemented, within 90 days of the APCO's approval of a refinery on-going emissions inventory report if that report identifies that emissions of criteria pollutants, TACs, or GHGs from the refinery have increased relative to the baseline period in excess of trigger-levels. The emission reduction plan shall include, at a minimum, the following:

405.1 Causal Analysis: For any pollutant for which trigger levels are identified as being exceeded under Section 12-15-402.6, an explanation of the cause of the increase in emissions shall be provided. The causal analysis shall include:

- 1.1 Identification of the source(s) of emissions that contributed most significantly to the refinery-wide emissions increase
- 1.2 Identification of the factor, or factors, that resulted in the emissions increase, and a description of the analysis that led to these findings. This section shall address, in addition to other potential factors involved, the degree to which changes in crude slate at the petroleum refinery may have caused or contributed to the emissions increase. Records of the quantity and

composition of crude oil, and any other pre-processed feedstocks refined at the facility, shall be included to support these findings.

1.3 For instances in which accidental air releases are identified in Section 12-15-405.1.2 as causing or contributing to an emissions increase that exceed trigger-levels at the refinery, identification of the accident's initiating event and any contributing factors, and a description of the investigation that led to these findings.

405.2 Planned Emission Reductions: Identification and description of any air emission reduction measures that the refinery owner/operator has planned and is committed to implement. The description provided shall identify the specific source(s) involved, the estimated emission reductions, and a schedule for the permitting and implementation of the measures identified.

405.3 All Feasible Measures: If the planned emission reductions identified under Section 12-15-405.2 are insufficient to reduce the on-going refinery-wide emissions increase to less than trigger-levels within a period of two years of the date the plan is submitted, a refinery emission reduction audit shall be completed for each pollutant that exceeds trigger-levels, and the audit report provided as an element of the emission reduction plan. The emission reduction plan shall identify the specific source(s) for which the audit determines that air emission reduction measures are determined to be feasible, estimate the emission reductions that will result from their implementation, and provide a schedule for the expeditious permitting and implementation of all feasible measures.

405.4 Updated Emission Reduction Plans: Updates to existing emission reduction plans shall address the status of air emission reduction measures included in the existing plan. If the existing plan failed to reduce emission increases to less than trigger-levels within two years as the plan specified under Section 12-15-405.2, the updated emission reduction plan shall include a refinery emission reduction audit. If the existing emission reduction plan included a refinery emission reduction audit, the updated emission reduction plan shall include an updated refinery emission reduction audit that addresses the feasibility of potential air emission reduction measures based on any changes that may have occurred in economic, environmental, legal, social and technological factors.

12-15-406 Review and Approval of Emission Reduction Plans: The procedure for determining whether an emission reduction plan, or an update to an emission reduction plan, submitted under Section 12-15-405 meets the applicable requirements of this rule is as follows:

406.1 Preliminary Review: Within 45 days of receipt of the emission reduction plan, the APCO will complete a preliminary review of the plan to identify any deficiencies that need to be corrected. If the APCO determines that the submitted plan is deficient, the APCO will notify the refinery owner/ operator in writing. The notification will specify the basis for this determination and the required corrective action.

406.2 Corrective Action: Upon receipt of such notification, the refinery owner/ operator shall correct the identified deficiencies and resubmit the proposed emission reduction plan within 45 days. If the APCO determines that the refinery owner/operator failed to correct any deficiency identified in the notification, the APCO will disapprove the plan.

406.3 Public Comment: The emission reduction plan, including any revisions made to correct deficiencies, will be made available to the public for at least 45 days (with exception of confidential information). The APCO will consider any written comments received during this period prior to approving or disapproving the final plan.

406.4 Final Action: Within 45 days of the close of the public comment period under Section 12-15-406.3, the APCO will approve the emission reduction plan if the APCO determines that the plan meets the requirements of Section 12-15-405, and will provide written notification to the refinery owner/operator. This period may be extended if necessary as determined by the APCO. If the APCO determines that the plan does not meet the requirements of Section 12-15-405, the APCO will notify the refinery owner/operator in writing. The notification will specify the basis for this

determination. Upon receipt of such notification, the refinery owner/operator shall correct the identified deficiencies and resubmit the plan within 45 days. If the APCO determines that the refinery owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the refinery owner/operator has failed to meet the requirements of Section 12-15-405 and will disapprove the plan.

406.5 Public Inspection: Within 15 days of the approval or disapproval of an emission reduction plan under Section 12-15-406.4, the APCO shall post the plan on the District's website, and shall notify any member of the public, who submitted comments under Section 12-15-406.3, or who otherwise requested such notification of this action in writing. In making information available for public inspection, the confidentiality of trade secrets, as designated by the refinery owner/operator, shall be handled in accordance with the District's procedures for handling requests for documents containing trade secrets.

12-15-407 Modeling Demonstration for Emission Increases of PM_{2.5}, TACs, and CO: The refinery owner/operator may elect to demonstrate by modeling that an emission increase of PM_{2.5}, TACs, or CO (greater than 100 tons per year) from the refinery relative to the baseline period does not exceed the air concentration-based, or health risk-based, trigger levels specified in Section 12-15-228.1 or 228.2. Such a demonstration shall be submitted to the APCO as an element of an on-going emissions inventory report, and shall be conducted in accordance with the following:

407.1 Air Concentrations of PM_{2.5} and CO: Air concentrations of PM_{2.5} and CO shall be based on an air dispersion modeling analysis performed to the satisfaction of the APCO, and which includes meteorological and topographic data necessary to estimate such concentrations. Evaluation of CO concentrations in the ambient air shall include appropriate background concentrations established based on ambient air quality monitoring data and/or modeling of local CO sources.

407.2 Health Risks from TAC Emissions: Health risks from TAC emissions shall be based on an air dispersion modeling analysis performed to the satisfaction of the APCO, and which includes meteorological and topographic data necessary to estimate such concentrations. Cancer risk and non-cancer Hazard Index shall be calculated from the modeling results using current guideline methods adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program.

12-15-408 Air Monitoring Plans: On or before December 31, 2014, the refinery owner/operator shall submit to the APCO a plan for establishing and operating a fence-line monitoring system and a community air monitoring system. The plan shall include detailed information describing the equipment to be used to monitor and record pollutant levels, the siting, operation, and maintenance of this equipment, and procedures for implementing data quality assurance and quality control. Within one year of the issuance of any updated air monitoring guidelines published by the APCO under Section 12-15-411, the refinery owner/operator shall submit to the APCO an updated air monitoring plan.

12-15-409 Review and Approval of Air Monitoring Plans: The procedure for determining whether an air monitoring plan submitted under Section 12-15-408 meets the applicable requirements of this rule is as follows:

409.1 Preliminary Review: Within 45 days of receipt of the air monitoring plan, the APCO will complete a preliminary review of the plan to identify any deficiencies that need to be corrected. If the APCO determines that the submitted plan is deficient, the APCO will notify the refinery owner/operator in writing. The notification will specify the basis for this determination and the required corrective action.

409.2 Corrective Action: Upon receipt of such notification, the refinery owner/operator shall correct the plan and resubmit the proposed plan within 45 days. If the APCO determines that the refinery owner/operator failed to correct any deficiency identified in the notification, the APCO will disapprove the plan.

409.3 Public Comment: The plan, including any revisions made to correct deficiencies, will be made available for public review for at least 45 days (with the exception of information designated confidential). The APCO will consider any written comments

received during this period prior to approving or disapproving the final plan.

409.4 Final Action: Within 45 days of the close of the public comment period under Section 12-15-409.3, the APCO will approve the air monitoring plan if the APCO determines that the plan meets the requirements of Section 12-15-408 and Section 12-15-602, and shall provide written notification to the refinery owner/operator. This period may be extended if necessary as determined by the APCO. If the APCO determines that the plan does not meet the requirements of Section 12-15-408 and Section 12-15-602, the APCO will notify the refinery owner/operator in writing. The notification will specify the basis for this determination. Upon receipt of such notification, the refinery owner/operator shall correct the identified deficiencies and resubmit the air monitoring plan within 45 days. If the APCO determines that the refinery owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the refinery owner/operator has failed to meet the requirements of Sections 12-15-408 and Section 12-15-602 and will disapprove the plan.

409.5 Public Inspection: Within 15 days of the approval or disapproval of an air monitoring plan under Section 12-15-409.4, the APCO shall post the plan on the District's website, and shall notify any member of the public who submitted comments under Section 12-15-409.3, or who otherwise has requested such notification of this action in writing. In making information available for public inspection, the confidentiality of trade secrets, as designated by the refinery owner/operator, shall be handled in accordance with the District's procedures for handling requests for documents containing trade secrets.

12-15-410 Emissions Inventory Guidelines: The APCO shall publish, and periodically update, emissions inventory guidelines for petroleum refineries that specify the methodology to be used for establishing emissions inventories required under this rule. Methods included in these guidelines may include, but are not limited to, continuous monitoring to measure emissions, applying the results of emissions source tests to known activity levels, combining published emission factors with known activity levels, material balances, or empirical formulae.

12-15-411 Air Monitoring Guidelines: The APCO shall publish air monitoring guidelines for petroleum refineries that contain specifications for community air monitoring systems and fence-line monitoring systems required under this rule. These guidelines may include, but are not limited to, specifications for pollutant coverage, siting, instrumentation, operation, maintenance, quality assurance, quality control, and data reporting. The guidelines shall be updated by the APCO within five years of initial issuance in consideration of advances in air monitoring technology, updated information regarding the health effects of air pollutants, and review of data collected by existing fence-line and community air monitoring systems established under this rule.

12-15-412 Designation of Confidential Information: When submitting an emissions inventory report, emission reduction plan, air monitoring plan, or other documents or records required by this rule, the refinery owner/operator shall designate as confidential any information claimed to be exempt from public disclosure under the California Public Records Act, Government Code Section 6250 et seq. If a document is submitted that contains information designated confidential in accordance with this section, the owner/operator shall provide a justification for this designation and shall submit a separate copy of the document with the information designated confidential redacted.

12-15-500 MONITORING AND RECORDS

12-15-501 Community Air Monitoring System: Within one year of the approval of an air monitoring plan under Section 12-15-409.4, the refinery owner/operator will ensure that a community air monitoring system is installed, and is operated and maintained in accordance with the approved air monitoring plan. Community air monitoring system data shall also be reported as specified in the approved plan.

12-15-502 Fence-line Monitoring System: Within one year of the approval of an air monitoring plan

under Section 12-15-409.4, the refinery owner/operator will ensure that a fence-line monitoring system is installed, and is operated in accordance with the approved air monitoring plan. Fence-line monitoring system data shall also be reported as specified in the approved plan.

12-15-503 Recordkeeping: The refinery owner/operator shall maintain records of all monitoring information, source test results, material and fuel throughputs, and other information used to establish emissions inventories required under this rule. Such records shall be maintained for a period of five years after the submittal of a required emissions inventory report, and shall be made available to the APCO upon request. The refinery owner/operator shall also maintain records of the quantity and composition of crude oil, and other pre-processed feedstocks, that are refined. Composition data shall include, at a minimum, API gravity and sulfur content.

12-15-600 MANUAL OF PROCEDURES

12-15-601 Emissions Inventory Procedures: Each emissions inventory required under this rule shall be prepared following the District's Emission Inventory Guidelines for Petroleum Refineries established under Section 12-15-410.

12-15-602 Air Monitoring Procedures: Each air monitoring plan required under this rule shall be prepared following the District's Air Monitoring Guidelines for Petroleum Refineries established under Section 12-15-411.



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

WORKSHOP REPORT

DRAFT

**BAAQMD REGULATION 12, RULE 15:
PETROLEUM REFINING EMISSIONS
TRACKING**

APPENDIX D

**FLOWCHART
FOR EMISSIONS TRACKING AND EMISSION
REDUCTION PLAN ELEMENTS OF RULE**

Rule Flowchart

Prepare Baseline Emissions Inventory

Prepare Next Annual On-going Emissions Inventory
1. Update baseline emissions inventory, if needed
2. Identify if an emissions increase exceeds trigger-levels

Are Trigger-Levels Exceeded?

No

Yes

Implement Emission Reduction Plan (or Updated Plan)

No

Is an Existing Emission Reduction Plan in Effect?

↑

Prepare Emission Reduction Plan
1. Causal analysis
2. Implement measures sufficient to reduce emission increase to less than trigger-levels within 2 years, or
3. Complete emission reduction audit and implement all feasible measures with an expeditious schedule

Yes

Update Emission Reduction Plan
1. Causal analysis
2. Update status of measures in existing plan
3. If failed to reduce emission increase to less than trigger-levels within 2 years under Section 12-15-405.2, complete emission reduction audit and implement all feasible measures, or
4. If existing plan included audit, complete updated audit and implement all feasible measures with an expeditious schedule